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Unraveling US Newspapers' Digital and Print Subscriptions in the Context of Price, 2016–2022

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Abstract

Despite industry-wide efforts in digitally transforming news organizations, research showed that most newspapers' legacy products still outperformed the same newspaper's digital offerings in terms of engagement, circulation, readership, pricing, advertising, and subscription revenue—all by a wide margin. But Covid-19 created an unprecedented scenario where the need for instant, local news updates, the fear of contacting anything tangible, and financial stress may have changed consumer behavior. To assess the state of the newspaper industry, this study analyzes short-term and long-term trends in US newspapers' digital and print circulation before and during the pandemic. The analysis considered price, an important factor often neglected in discussions about newspaper demand. Utilizing rich industry data, this study analyzed 18 US metro daily newspapers' circulation trends during 2016–2022. The results revealed that digital circulation increased rapidly after the onset of Covid-19 but subsequently decreased after reaching the peak in Q3 2021. Print circulation continued its rapid decline since 2016, accompanied by continuous, substantial price hikes for print subscriptions—a typical print subscription now costs over \$1,000 a year. Despite circulation declines, the print edition remains the core product, with more subscribers paying far more than digital subscribers. Because of the immense price gap (6 to 1), the seemingly promising increase in digital subscriptions during Covid-19 could not generate nearly as much revenue to cover the loss on the print side, resulting in a substantial loss in total subscription revenue. The state of the US newspaper industry needs immediate attention.

Keywords

Covid-19; digital subscription; digital transformation; newspaper circulation; newspapers; subscription revenue

1. Introduction

Since the onset of digital journalism, dating back to the mid-1990s, the economic sustainability of online journalism has been a subject of scrutiny, which at its core revolves around the viability of digital subscriptions as a source of funding for journalism. Despite longstanding, industry-wide efforts in digitally transforming newspaper firms and a large number of users accessing news online (Newman et al., 2023), digital subscriptions have not turned into a reliable stream of revenue (Chyi & Ng, 2020; Edmonds, 2022).

Research on consumer behavior pointed to users' lukewarm responses to newspapers' digital offerings—in terms of use (Chyi & Tenenboim, 2017; Thurman, 2014, 2017) and subscription (Chyi, 2012; Chyi & Ng, 2020)—as a significant reason underlying news organizations' challenges in monetizing digital content. This also explains why the vast majority of US newspapers continue to heavily rely on their legacy product, as it remains the primary source of both advertising and subscription revenue (Chyi & Ng, 2020; Pew Research Center, 2023). To compensate for the substantial loss in advertising revenue since the 2008 recession, the industry sought short-term profits by sharply raising the price of the print product (Chyi & Tenenboim, 2019). The print edition, once considered the “cash cow” product (Picard, 2003), has also experienced substantial declines in circulation in recent years (Pew Research Center, 2023).

While newspaper firms found themselves caught between an unsuccessful digital experiment and a rapidly weakening print product, Covid-19 created a scenario that may have resulted in a shift in newspapers' financial landscape. First, during the pandemic, the demand for instant, local news updates skyrocketed (Kim et al., 2022). Second, the reluctance to interact with tangible objects at the onset of the pandemic might have weakened the existing demand for the printed product. The financial stress induced by the pandemic also might have driven print subscribers to seek cheaper alternatives, such as the same newspaper's digital offerings. All these factors could have provided new momentum for newspaper firms, which have been grappling with digital transformation for more than two decades. This scenario presents a great opportunity to re-assess news consumers' willingness to pay for newspapers' print and digital offerings.

Given circulation is the most important indicator of newspaper demand, this study seeks to unravel the print-digital gap by identifying both short-term and long-term trends in 18 US newspapers' digital and print circulation from 2016 to 2022—before and during the pandemic. Additionally, as previous research has highlighted, price, the determinant of quantity demanded (Hoskins et al., 2004), is often neglected in industry discussion and media coverage on newspaper demand (Chyi & Tenenboim, 2019). Consequently, this study tracks the price of digital/print subscriptions over time and examines digital/print circulation in this context. By analyzing both circulation and pricing data, this study also presents an evaluation of subscription revenue trends.

While newspapers are confronting existential challenges, this study serves three primary goals: (a) to provide a systematic, up-to-date examination of the state of newspapers through identifying long-term and short-term industry trends in the appropriate economic context; (b) to contribute to media economics research by examining digital news consumption in depth; and (c) to offer a critical review on US newspaper firms' technology-centric product strategy.

2. Digital Subscriptions: Research Inquiries

2.1. History of Industry Attempts

In the 1990s, some US newspapers worried about the “cannibalization effect,” fearing that a free web edition might erode their print subscriber base, but the vast majority opted for the advertising model, giving content away for free for well over a decade. *The Wall Street Journal* was a prominent outlier, charging 150,000 online readers a \$49 annual subscription fee back in 1998 (Steinbock, 2000).

After the internet bubble burst in 2000, while some publishers proposed to charge for the content they offered online (Outing, 2002, as cited in Chyi, 2012) because “there ain’t no such thing as a free lunch,” users were not ready to pay for online news. The sign-up rate for paid-for newspaper sites was as low as 0.2% to 2.6% of the print circulation, and 71% of online news users said they would go somewhere else because free sites were readily available (Borrell & Associates, 2001, as cited in Chyi, 2012). The notion that content must be free unless it is highly specialized (Carlson, 2003) and “it is impossible to charge for general news content” (Herbert & Thurman, 2007, p. 215) gained widespread acceptance in the industry.

The New York Times dropped its first fee-based experiment (TimesSelect) in 2007, on which Jeff Jarvis (2007) commented, “With it goes any hope of charging for content online. Content is now and forever free” (para. 1). The vast majority of US newspaper sites continued giving content away for free (American Press Institute & ITZBelden, 2009), with notable exceptions of *The Wall Street Journal*, *The Arkansas Democrat-Gazette* (Hussman, 2007), and *The Albuquerque Journal* (Windsor, 2009).

After the 2008 recession, “the [industry’s] dream of getting people to pay” recurred (Kinsley, 2009, para. 2), and the idea was put into practice in 2011. *The Dallas Morning News* started a “hard paywall,” charging \$16.95 a month for a digital package that included web and apps (Doctor, 2011). Weeks later, *The New York Times* implemented a metered model, or a “soft paywall,” requiring online users who view more than 20 articles (reduced to 10 in April 2012) per month to pay a subscription fee (Peters, 2011).

While some newspapers dropped their paywalls (Ananny & Bighash, 2016), most major US newspapers have adopted the digital subscription model, charging for online news access. By 2015, among the 98 US newspapers with a total circulation of 50,000 or more, 77 implemented some kind of paywalls around their digital products (Williams, 2016). In 2016, the result of the US election triggered a “subscription surge” (aka the “Trump bump”). The growing number of digital subscribers among national newspapers (Benton, 2018; Stelter, 2017), especially *The New York Times*, received substantial media attention.

However, most US newspapers’ paywall experiments were not nearly as successful. Drawing on data from 2017 released by the Alliance for Audited Media ([AAM] formerly ABC, the Audit Bureau of Circulations), Chyi and Ng (2020) empirically examined 50 major US newspapers’ digital and print subscriptions. They revealed that most newspapers charged digital subscribers a fraction of the print subscription price, but digital subscribership remained trivial, contributing only 3% of total reader revenue. This study triggered questions about the disparities between some newspapers’ self-claimed digital subscription figures and the audited data. When media business reporter Rick Edmonds investigated the issue, he found “extreme reluctance” among news executives to discuss these discrepancies (Edmonds, 2021).

2.2. Subscription Surge During the Pandemic?

While the industry was experimenting with the subscription model, media scholars examined its viability from the demand side (for a detailed review, see O'Brien et al., 2020). Yet, the pandemic has created an unprecedented scenario where multiple factors, especially the skyrocketing demand for immediate updates on Covid-19 developments, may have boosted digital subscriptions, triggering another “subscription surge.” This study takes this opportunity to measure news consumers’ demand for newspapers’ digital subscriptions by empirically examining short-term and long-term digital circulation trends, addressing this research question:

RQ1: To what extent has digital circulation increased during Covid-19?

2.3. Print Circulation: Long-Term and Short-Term Trends

The decline in print circulation is a well-established trend that has persisted for decades. Industry data (Pew Research Center, 2023) indicated that weekday newspaper circulation has been decreasing since 1987, while Sunday circulation has seen a decline since 1993, even with the continuous growth of the US population. Taking a broader perspective, newspaper penetration has exhibited a steady decline of 1–2% each year since 1950 (Picard, 2008; Picard & Brody, 1997).

Hal Varian, Google’s chief economist, also shed light on the matter, noting that newspaper circulation reached its peak in 1972, suggesting that the decline in circulation can be attributed to competition from other media outlets such as broadcast TV news, cable news, and the internet (Varian, 2013).

During the 2008 recession, most US newspapers experienced substantial print circulation declines (Chyi et al., 2012; Pew Research Center, 2023). During the pandemic, the financial stress induced by Covid-19 and the apprehension of contacting tangible things during Covid-19 may have quickened the decline in print circulation. To examine the state of print newspapers, this study seeks to identify short- and long-term print circulation trends, addressing the following research question:

RQ2: To what extent has print circulation declined before and during Covid-19?

2.4. The Print-Digital Gap in Circulation

Despite the long-term declines in print circulation and the industry’s efforts in digitally transforming their newspaper, the print edition remained the core product, generating the majority of subscription and advertising revenue (Benton, 2018; Pew Research Center, 2023; Picard, 2014; Thurman, 2014, 2017). Empirical research showed that readers responded more favorably to the same newspaper’s print product (Chyi, 2012; Herbert & Thurman, 2007; Myllylahti, 2014; Thurman, 2014, 2017). The gap between the “supposedly promising” digital edition and the “supposedly dying” print product was also prominent in terms of subscribership. A pre-Covid-19 study compared print and digital circulation among 39 US newspapers, revealing that print circulation exceeded digital circulation in all cases, and digital subscribers often constituted a small, almost negligible fraction of overall circulation (Chyi & Ng, 2020). Such findings suggested that, more than 20 years into US newspapers’ digital experiment, news consumers’ willingness to pay for online news was still non-existent. But the scenario triggered by Covid-19 might have significantly

changed user behavior and narrowed or even closed the enormous print-digital gap for the very first time. To assess the current state of the circulation gap between print and digital, this study proposes the following research question:

RQ3: How does print circulation compare with the same newspaper's digital circulation before and during Covid-19?

2.5. Price: The Determinant of Quantity

Price is the determinant of quantity demanded (Hoskins et al., 2004). It is however often ignored in discussions and media coverage about newspaper demand (Chyi & Tenenboim, 2019). Since the 2008 recession, in hopes of reducing reliance on rapidly diminishing advertising revenue, most daily newspapers implemented continuous price hikes on their print subscribers. A longitudinal study tracking 25 major US newspapers' print subscription rates in 2008, 2012, and 2016 revealed that these newspapers' seven-day home delivery prices more than doubled since the recession (Chyi & Tenenboim, 2019). The increase in prices naturally resulted in declines in circulation, which made news headlines and fueled the perception that "print is dying." However, industry reports and media coverage seldom consider price as a primary driver of circulation declines. Since price directly affects quantity demanded (and revenue), it is essential to consider changes in price when interpreting demand for multiplatform newspaper products. To contextualize changes in print circulation, this study tracks changes in print subscription prices, addressing this research question:

RQ4: Have print subscription prices continued to rise over time?

Economic theory suggests that the price of a related good affects demand for a product (Hoskins et al., 2004). It is therefore essential to consider how newspaper firms price their print and digital products simultaneously. It is no secret that newspaper firms have had difficulties charging digital subscribers a premium price. In a study empirically examining the pricing schemes of 50 US newspapers, it was found that a digital subscription was priced at 23% of the cost of the corresponding print edition (Chyi & Ng, 2020). This price gap suggested that it required over four digital subscribers to generate the same amount of revenue as a single print subscription. To re-examine whether the existing price gap changed during Covid-19, this study addresses this research question:

RQ5: How does the print subscription price compare with the same newspaper's digital subscription price?

2.6. Impact on Subscription Revenue

Newspapers generate revenue from two major sources: advertising and circulation. According to the latest Pew report, industry-side advertising revenue has been declining, and in 2020, circulation revenue surpassed advertising revenue for the first time (Pew Research Center, 2023). As a result, circulation now stands as the primary revenue source for newspapers.

Chyi and Ng (2020) estimated that in 2017, print subscriptions contributed 97% of total subscription revenue, while digital accounted for only 3% of such revenue. That finding resembled a final verdict

suggesting US newspapers' industry-wide efforts in digital transformation did not make monetary sense. However, the digital surge during Covid-19 might have led to a shift in newspapers' financial landscape. To re-assess the share of digital subscription revenue among total subscription revenue, this study addresses the following research question:

RQ6: To what extent do digital subscriptions contribute to overall subscription revenue?

3. Method

To identify short-term and long-term circulation trends and to assess the impact of Covid-19, this study analyzes 18 US newspapers' digital/print circulation and pricing data during 2016–2022. Since the pandemic triggered extensive lockdowns and restrictions in the US starting in March 2020, the analysis comprised nine time points—four before and four after Q1 2020.

3.1. Sample

Sampling started from a list of 50 news publications featured in Pew Research Center's 2016 State of the News Media Report (Pew Research Center, 2017), which includes four national newspapers and 46 metro newspapers operating in 28 states. The researchers closely examined the data source and excluded newspapers that did not file detailed digital circulation data during 2016–2022 and those with missing data at more than two time points. The final sample includes 18 local dailies operating in 16 states—all are leading newspapers in their respective markets. With 18 cases, we could reasonably generalize and at the same time examine each individual case.

3.2. Data Collection

Each newspaper's digital/print circulation and pricing data were manually retrieved from the audit reports and the news media statements filed for the AAM in 2016–2019, Q1 2020, Q3 2020, Q1 2021, Q3 2021, and Q1 2022.

Since the AAM reports after 2020 no longer include pricing data, current digital subscription prices and promotion offers were collected from each newspaper's website from June 2020 to February 2021.

3.3. Measures and Definitions

3.3.1. Print and Digital Circulation

The print product refers to what AAM defined as a "traditional hard copy of the newspaper," and the digital product refers to what AAM defined as Digital Nonreplica, which is "a digital edition that is consistent in character and editorial content with the print edition....Advertising may differ" (AAM, 2022b). Examples of the latter include mobile apps and restricted websites with paywalls (AAM, 2022a).

The AAM reports provide both paid and non-paid circulation data. Since this study focuses on paying subscribership, the analysis is centered on paid circulation, which is the number of subscribers. Total

Average Paid Circulation data (including individually paid circulation and business/traveler paid circulation) for weekdays (i.e., average Monday–Friday or Monday only) for digital nonreplica and print products were retrieved.

3.3.2. Print and Digital Price

The print subscription price (2016–2019) refers to the yearly price, based on 52 weeks, for the home delivery of the print edition as listed in the AAM audit reports. After 2020 the AAM no longer provides such data.

Regarding digital subscriptions, since the AAM no longer provides pricing data after 2020, the researchers turned to each newspaper's website and collected the digital price of the "unlimited digital access" package, which typically encompasses access to the website, mobile app, digital-edition replica, and in certain cases the e-reader edition for the Kindle. Also retrieved from each newspaper's website was the promotional price, which refers to the discounted introductory price for the "unlimited digital access" package, offered to potential subscribers for a certain period of time. Data were retrieved from June 2020 to February 2021.

3.3.3. Subscription Revenue

Digital/print subscription revenue refers to the earnings derived from digital/print subscriptions. It is estimated by multiplying the number of subscribers by the subscription price using the most recent data accessible (specifically, digital and print circulation from Q1 2022, digital subscription prices from 2020–2021, and print subscription prices from 2019).

4. Results

RQ1 concerns the increases in digital circulation (i.e., the number of digital subscribers) during Covid-19. The analysis revealed that most of the 18 newspapers under study, with the exception of five cases, experienced growth in digital circulation during the pandemic. Table 1 presents data for each of the 18 newspapers across nine time points. Taken as a whole, digital circulation increased rapidly after the onset of Covid-19—the median rose from 10,810 in 2019 (pre-Covid-19) to 21,959 in Q3 2021 (the peak), but subsequently decreased to 14,248 by Q1 2022.

Among the 18 newspapers, *The Boston Globe* stands out as the most successful case both for starting with the largest digital subscribership (75,166 in 2017) and for continuously growing it during Covid-19 (adding 139,175 more since 2019). Percentage-wise, the most substantial growth in digital subscriptions was reported by *The Fort Worth Star-Telegram* (350%), followed by *Newsday* (207%), *The Miami Herald* (198%), *The Boston Globe* (133%), and *The Seattle Times* (112%).

RQ2 concerns declines in print circulation (i.e., the number of print subscribers) before and during Covid-19. Table 2 presents the results. All the 18 newspapers under study reported substantial, rapid declines in print circulation over time—the median circulation decreased from 101,378 in 2016 to 59,446 in 2019, and then to 34,474 in Q1 2022 (there was one case with missing data in 2016). Some newspapers lost more print subscribers than others. *The Los Angeles Times*, the largest newspaper on the list, has lost more than 80,000 print subscribers since 2019, which is 36% of its print circulation. Percentage-wise, *The Fort Worth*

Table 1. Number of digital nonreplica subscribers (2016–2022).

State	Newspaper	2016	2017	2018	2019	Q1 2020	Q3 2020	Q1 2021	Q3 2021	Q1 2022	Change since 2019	Change since 2019 in %
AZ	The Arizona Republic	10,985	10,384	11,349	13,938	16,157	22,540	24,354	27,939	27,501	13,563	97%
CA	Los Angeles Times	30,793	42,985	58,403	60,468	64,550	89,066	78,780	68,679	68,039	7,571	13%
CA	Sacramento Bee	6,618	5,596	3,939	5,891	6,868	8,404	10,043	10,813	10,719	4,828	82%
CO	Denver Post	4,746	3,171	2,557	8,967	18,606	25,761	30,030	29,556	2,515	−6,452	−72%
FL	Miami Herald	8,242	6,492	5,779	10,695	19,612	23,306	27,136	30,677	31,859	21,164	198%
IA	The Des Moines Register	5,423	6,983	6,558	7,104	6,100	6,068	5,952	6,095	5,714	−1,390	−20%
IN	Indianapolis Star	8,347	10,424	10,558	10,925	10,905	10,693	11,102	12,075	11,158	233	2%
KS	The Kansas City Star	3,617	1,819	6,025	11,053	17,843	19,431	22,222	23,802	18,183	7,130	65%
KY	The Courier-Journal	4,065	6,020	5,698	5,628	5,586	5,710	5,442	6,121	5,817	189	3%
MA	The Boston Globe	NA	75,166	94,593	105,015	166,712	229,027	235,518	234,398	244,190	139,175	133%
MN	The Star Tribune	65,987	69,368	69,364	76,117	90,363	100,128	100,345	95,362	94,902	18,785	25%
NC	Charlotte Observer	2,740	3,510	6,308	8,741	10,272	11,630	13,229	14,146	14,196	5,455	62%
NY	Newsday	6,271	6,778	8,741	20,011	23,906	34,095	37,752	54,804	61,528	41,517	207%
OH	Cincinnati Enquirer	8,557	10,307	9,834	10,110	10,392	9,819	10,138	11,115	9,082	−1,028	−10%
TX	Fort Worth Star-Telegram	1,336	1,620	908	2,280	7,785	8,857	10,045	10,844	10,253	7,973	350%
TX	San Antonio Express-News	4,515	4,660	7,007	9,280	8,995	12,336	16,554	20,116	4,967	−4,313	−46%
WA	Seattle Times	13,523	19,318	27,429	36,228	46,962	61,012	70,267	71,974	76,704	40,476	112%
WI	Milwaukee Journal Sentinel	NA	NA	9,653	18,396	17,303	15,826	16,674	16,130	14,300	−4,096	−22%
	Median	6,445	6,778	7,874	10,810	16,730	17,629	19,448	21,959	14,248	6,293	44%
	Mean	11,610	16,741	19,150	23,380	30,495	38,539	40,310	41,369	39,535	16,154	−
	Sum										290,780	−
	Count (out of 18)	16	17	18	18	18	18	18	18	18	18	18

Note: NA = not available. Source: AAM (2016–2022).

Table 2. Number of print subscribers (2016–2022).

State	Newspaper	2016	2017	2018	2019	Q1 2020	Q3 2020	Q1 2021	Q3 2021	Q1 2022	Change since 2019	Change since 2019 in %
AZ	The Arizona Republic	163,678	142,354	124,944	99,676	101,162	80,132	80,992	66,545	68,437	–31,239	–31%
CA	Los Angeles Times	331,337	296,572	254,906	221,517	190,875	173,485	162,272	146,724	140,795	–80,722	–36%
CA	Sacramento Bee	104,486	88,911	72,673	58,199	52,703	49,569	44,808	39,656	35,923	–22,276	–38%
CO	Denver Post	144,782	122,709	105,553	89,530	68,463	64,153	60,878	55,916	51,622	–37,908	–42%
FL	Miami Herald	68,103	57,845	44,067	33,896	33,706	28,829	24,240	21,580	21,177	–12,719	–38%
IA	The Des Moines Register	66,190	60,249	51,726	42,729	33,877	32,220	30,717	28,859	26,246	–16,483	–39%
IN	Indianapolis Star	93,399	82,125	66,374	52,202	46,291	43,741	40,869	38,475	33,024	–19,178	–37%
KS	The Kansas City Star	101,378	85,996	73,769	60,693	53,589	45,762	40,841	35,736	32,820	–27,873	–46%
KY	The Courier-Journal	84,338	76,330	62,657	49,277	41,509	38,828	35,717	32,413	28,995	–20,282	–41%
MA	The Boston Globe	NA	128,455	116,992	104,372	82,536	78,839	76,114	71,965	67,293	–37,079	–36%
MN	The Star Tribune	182,913	171,257	156,777	142,219	120,805	119,804	113,310	108,643	102,354	–39,865	–28%
NC	Charlotte Observer	78,780	67,441	55,316	47,373	42,388	39,003	34,046	29,685	25,763	–21,610	–46%
NY	Newsday	202,853	179,892	159,309	140,207	123,010	117,853	110,479	103,325	96,879	–43,328	–31%
OH	Cincinnati Enquirer	84,512	74,609	64,373	51,550	40,937	39,183	37,421	34,420	31,179	–20,371	–40%
TX	Fort Worth Star-Telegram	82,445	72,993	61,650	50,976	39,170	34,697	29,804	25,882	23,358	–27,618	–54%
TX	San Antonio Express-News	70,467	59,098	51,904	45,586	41,590	36,170	33,037	30,522	29,106	–16,480	–36%
WA	Seattle Times	154,049	142,704	129,845	119,311	103,832	99,114	94,157	88,909	84,084	–35,227	–30%
WI	Milwaukee Journal Sentinel	124,137	112,580	97,909	80,145	61,816	57,782	53,495	50,214	46,106	–34,039	–42%
	Median	101,378	87,454	73,221	59,446	53,146	47,666	42,839	39,066	34,474	–27,746	–38%
	Mean	125,756	112,340	97,264	82,748	71,014	65,509	61,289	56,082	52,509	–30,239	–
	Sum										–544,297	–
	Count (out of 18)	17	18	18	18	18	18	18	18	18	18	18

Note: NA = not available. Source: AAM (2016–2022).

Star-Telegram suffered the most significant decline, losing 54% of its print circulation, while *The Kansas City Star* and *Charlotte Observer* both experienced a 46% decrease. *The Star Tribune*, despite outperforming the rest of the newspapers in retaining print circulation, also lost 28% of its print subscribers during Covid-19.

These results seem appalling. The subsequent analysis would contextualize these declines with pricing information.

RQ3 concerns the extent to which Covid-19 has narrowed or closed the print-digital gap in circulation. The analysis compared print and digital circulation before and during Covid-19 for each of the 18 newspapers under study. Figure 1 presents the results. The enormous gap between print and digital circulation has indeed narrowed significantly for all the 18 newspapers under study. In two cases (*The Boston Globe* and *The Miami Herald*) the gap closed—meaning digital circulation surpassed print circulation during Covid-19, a pattern unseen in the pre-Covid-19 era. For the remaining 16 newspapers, however, the print edition remains the primary product in terms of circulation despite the digital surge during the pandemic.

To present the overall picture, Figure 2 summarizes the aggregate digital/print circulation data (median) of the 18 newspapers under study. Print circulation keeps declining, while digital circulation showed significant growth during the pandemic until the peak around Q3 2021. The print-digital gap has significantly narrowed; however, print circulation (with a median of 34,474 across 18 newspapers) still exceeds digital circulation (with a median of 14,248) by a considerable margin.



Figure 1. The print-digital circulation gap before and during Covid-19. Note: The purple line depicts print circulation (source: Table 2); the yellow line depicts digital nonreplica circulation (source: Table 1).

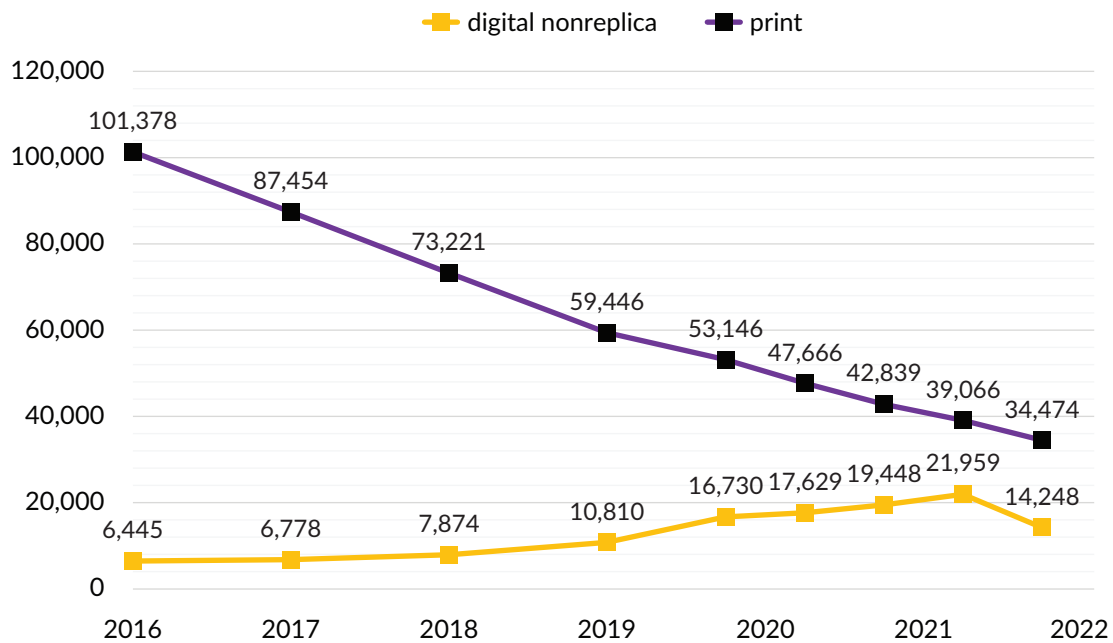


Figure 2. Digital and print circulation before and during Covid-19 among 18 newspapers. Note: The purple line depicts median print circulation (source: Table 2); the yellow line depicts median digital nonreplica circulation (source: Table 1).

RQ4 questioned whether print subscription prices continued to rise over time. Table 3 presents changes in home delivery prices for each of the 18 newspapers, and the answer is yes. Aggregately, the annual median subscription price increased from \$499 in 2016 (there was one case with missing data this year) to \$1,075 in 2019 (data after 2020 are unavailable). In other words, these papers charged their print readers about twice as much (or \$564 more) in merely three years. All but one newspaper significantly increased the print subscription price since 2016 (ranging from 30% to 178%), with *The Boston Globe* being the only exception. This newspaper began charging its print subscribers a whopping annual rate of \$1,347 as early as 2017.

A closer examination of how individual newspapers priced their legacy product revealed that some papers were more radical than others. In addition to *The Boston Globe*, the most expensive print newspaper on the list, *Sacramento Bee*, *Miami Herald*, *The Kansas City Star*, *Charlotte Observer*, and *Fort Worth Star-Telegram* also charge print subscribers \$1,300 a year.

Given that price is the determinant of quantity demanded, the continuous declines in print circulation should be understood in the context of the corresponding subscription price. Figure 3 visualizes simultaneously the circulation and pricing data for each of the 18 newspapers from 2016 to 2019. In almost all cases, print circulation declines were accompanied by substantial increases in price.

Table 3. Continuous increases in print subscription price.

State	Newspaper	2016	2017	2018	2019	Change 2016 to 2019	Ratio 2019/2016
AZ	The Arizona Republic	\$510	\$510	\$728	\$816	\$306	1.60
CA	Los Angeles Times	\$624	\$780	\$832	\$884	\$260	1.42
CA	Sacramento Bee	\$999	\$999	\$1,300	\$1,300	\$301	1.30
CO	Denver Post	\$286	\$468	\$754	\$754	\$468	2.64
FL	Miami Herald	\$684	\$684	\$1,040	\$1,300	\$616	1.90
IA	The Des Moines Register	\$516	\$876	\$1,284	\$1,284	\$768	2.49
IN	Indianapolis Star	\$468	\$702	\$1,032	\$1,032	\$564	2.21
KS	The Kansas City Star	\$623	\$1,040	\$1,300	\$1,300	\$677	2.09
KY	The Courier-Journal	\$492	\$492	\$1,078	\$1,078	\$586	2.19
MA	The Boston Globe	NA	\$1,347	\$1,347	\$1,347	NA	NA
MN	The Star Tribune	\$299	\$324	\$410	\$453	\$154	1.52
NC	Charlotte Observer	\$499	\$1,040	\$1,300	\$1,300	\$801	2.61
NY	Newsday	\$831	\$1,039	\$1,299	\$1,299	\$468	1.56
OH	Cincinnati Enquirer	\$468	\$468	\$754	\$1,072	\$604	2.29
TX	Fort Worth Star-Telegram	\$687	\$910	\$1,040	\$1,300	\$613	1.89
TX	San Antonio Express-News	\$494	\$546	\$546	\$663	\$169	1.34
WA	Seattle Times	\$493	\$493	\$546	\$728	\$235	1.48
WI	Milwaukee Journal Sentinel	\$320	\$627	\$864	\$890	\$570	2.78
	median	499	693	1,036	1,075	564	1.90
	mean	547	741	970	1,044	480	—
	count	17	18	18	18	17	17

Note: NA = not available. Source: AAM (2016–2019).

RQ5 questioned how the print subscription price compares with the same newspaper's digital subscription price. Table 4 presents the latest pricing data accessible. Results indicated that the annual price for a print subscription reached a record high by 2019 (median = \$1,075). In contrast, a digital subscription was priced at \$181 during the pandemic. It takes six digital subscribers to generate the same revenue from one single print subscription.

The price gap is most prominent for *Fort Worth Star-Telegram*, *The Kansas City Star*, *Newsday*, *Sacramento Bee*, *Miami Herald*, *Charlotte Observer*, *The Des Moines Register*, and *The Boston Globe*, where a print subscription costs \$1,000 more than the same newspaper's digital edition.

Table 4 also presents each newspaper's promotional price for new digital subscribers during Covid-19. The median is \$0.25 a week, while *The Boston Globe* and *The Des Moines Register* offered introductory rates as low as \$0.04 a week.

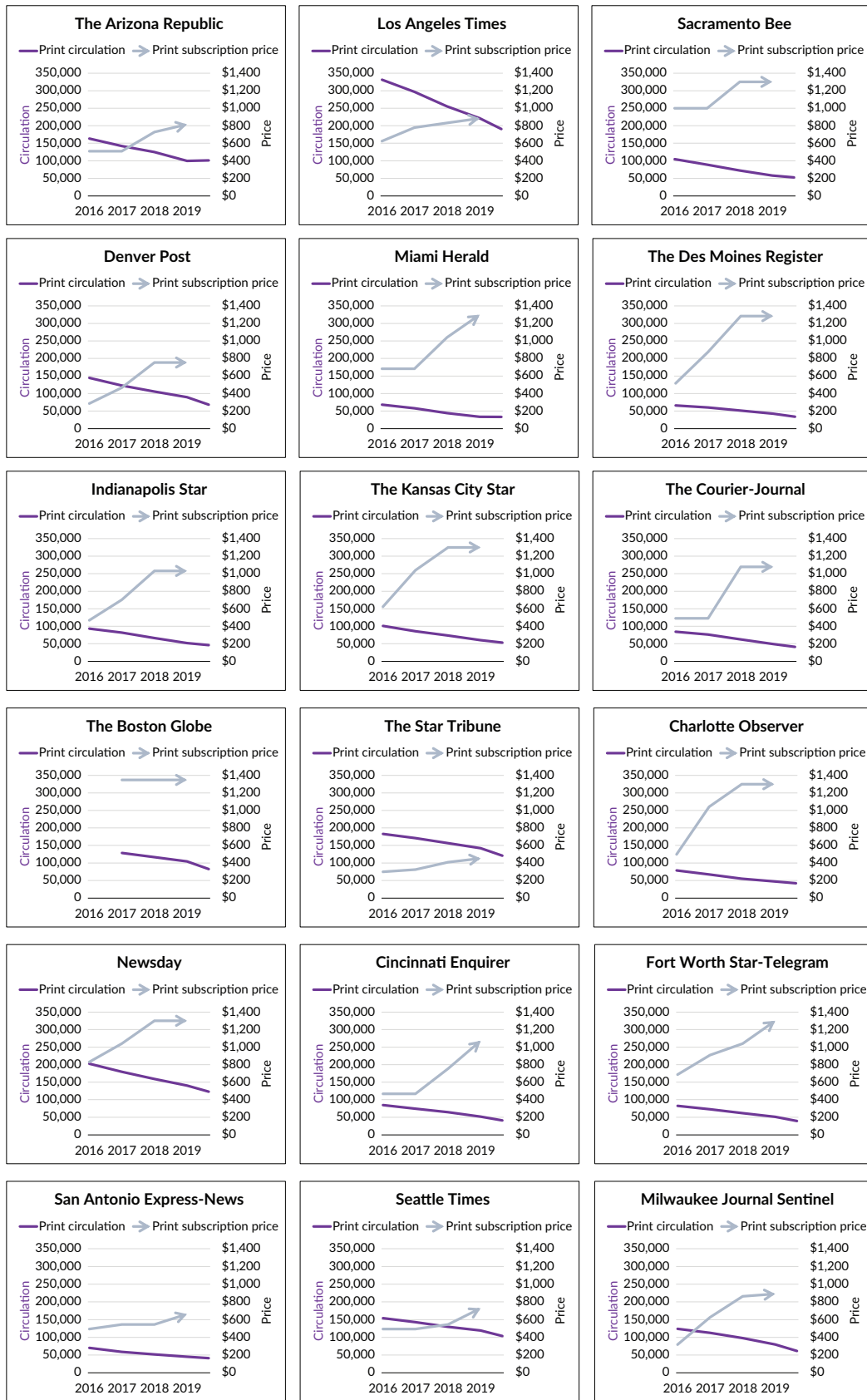


Figure 3. Print circulation declines in the context of price. Source: Tables 2 and 3 (AAM no longer reports pricing data after 2020).

Table 4. Comparing print and digital subscription prices.

State	Newspaper	Print price ^a (yearly)	Digital price ^b (yearly)	Difference Print- digital	Ratio digital / print	Digital promotional price ^b (weekly)
AZ	The Arizona Republic	\$816	\$120	\$696	15%	\$0.08
CA	Los Angeles Times	\$884	\$192	\$692	22%	\$0.25
CA	Sacramento Bee	\$1,300	\$192	\$1,108	15%	\$0.25
CO	Denver Post	\$754	\$180	\$574	24%	\$0.25
FL	Miami Herald	\$1,300	\$192	\$1,108	15%	\$0.50
IA	The Des Moines Register	\$1,284	\$240	\$1,044	19%	\$0.04
IN	Indianapolis Star	\$1,032	\$108	\$924	10%	\$0.25
KS	The Kansas City Star	\$1,300	\$160	\$1,140	12%	\$0.50
KY	The Courier-Journal	\$1,078	\$108	\$970	10%	\$0.25
MA	The Boston Globe	\$1,347	\$333	\$1,014	25%	\$0.04
MN	The Star Tribune	\$453	\$182	\$271	40%	\$0.25
NC	Charlotte Observer	\$1,300	\$192	\$1,108	15%	\$0.50
NY	Newsday	\$1,299	\$181	\$1,118	14%	\$0.25
OH	Cincinnati Enquirer	\$1,072	\$120	\$952	11%	\$0.08
TX	Fort Worth Star-Telegram	\$1,300	\$100	\$1,200	8%	\$0.50
TX	San Antonio Express-News	\$663	\$70	\$593	11%	\$0.24
WA	Seattle Times	\$728	\$192	\$536	26%	\$0.25
WI	Milwaukee Journal Sentinel	\$890	\$108	\$782	12%	\$0.25
	Median	\$1,075	\$181	\$961	15%	\$0.25
	Mean	\$1,044	\$165	\$880	—	\$0.26
	Count	18	18	18	18	18

Source: ^a AAM (2019), ^b 18 newspapers' websites, 2020–2021.

RQ6 concerns the share of digital subscription revenue among total subscription revenue. Table 5 presents the estimates. While *The Boston Globe* stands out with the highest digital subscription revenue share (47.3%) among the 18 newspapers, the median is 4.9%, suggesting that digital subscription revenue remains a fraction of total subscription revenue for the vast majority of newspapers.

Overall, from 2019 to Q1 2022, the 18 newspapers as a group gained 290,780 digital subscribers while losing 544,297 print subscribers. Given the gigantic price gap (one to six), a substantial decline in total subscription revenue is the outcome.

Table 5. Estimated share of digital subscription revenue among total subscription revenue.

State	Newspaper	Digital subscription revenue/total subscription revenue
AZ	The Arizona Republic	5.6%
CA	Los Angeles Times	9.5%
CA	Sacramento Bee	4.2%
CO	Denver Post	1.1%
FL	Miami Herald	18.2%
IA	The Des Moines Register	3.9%
IN	Indianapolis Star	3.4%
KS	The Kansas City Star	6.4%
KY	The Courier-Journal	2.0%
MA	The Boston Globe	47.3%
MN	The Star Tribune	27.1%
NC	Charlotte Observer	7.5%
NY	Newsday	8.1%
OH	Cincinnati Enquirer	3.2%
TX	Fort Worth Star-Telegram	3.3%
TX	San Antonio Express-News	1.8%
WA	Seattle Times	19.4%
WI	Milwaukee Journal Sentinel	3.6%
	Median	4.9%
	Count	18

Note: These estimates were based on the most recent data accessible—digital and print circulation from Q1 2022, digital subscription prices from 2020–2021, and print subscription prices from 2019.

5. Discussion

Utilizing rich industry data, this study presents a longitudinal analysis of circulation trends in a group of US newspapers. It re-assesses user demand for paid-for newspapers in digital and print formats before and during Covid-19. The results revealed that, during the pandemic, print circulation continued its decline, while digital subscriptions gained new momentum and experienced substantial growth, reaching a peak in Q3 2021. This “Covid-19 bump,” however, was subsequently followed by a noticeable decline in Q1 2022, raising questions about the sustainability of the initial increase. Meanwhile, print circulation moved along a remarkably consistent trendline since 2016, with declines showing no signs of acceleration during the pandemic.

Given the rise of digital and the continuous decline in print circulation, the long-time circulation gap between print and digital has narrowed significantly during the pandemic. Nevertheless, for the majority of newspapers examined in this study, print circulation continues to exceed digital circulation, suggesting that the resilience of the print product in relation to its digital counterpart, as revealed in previous studies (Chyi & Ng, 2020; Chyi

& Tenenboim, 2017), has not entirely diminished. However, print circulation at the current level is a cause for serious concern.

The potential death of newspapers was widely (and wildly) discussed during the 2008 recession (Chyi et al., 2012), but the current print circulation figures indicate a true existential challenge. Price is a crucial factor. The substantial industry-wide price hikes implemented after the recession played a role in the decline in readership from 2008 to 2016 (Chyi & Tenenboim, 2019). Yet, prices nearly doubled again between 2016 and 2019, undeniably contributing to the continuous declines in print circulation. When a typical print subscription costs over \$1,000 per year, which is on par with the price of the latest iPhone (a device with a significantly longer lifespan), such a pricing strategy appears unsustainable as it alienates even the most loyal readers.

While the price of print subscriptions has surged, monetizing online news access remains a challenge. Notably, the price gap between print and digital subscriptions identified in prior research (Chyi & Ng, 2020) has widened. Leading the game, *The Boston Globe* charges \$1,347/year for a print subscription while offering its “all digital access” package at \$333 (already the highest digital price among all 18 papers). If price is taken as an indicator of consumer preference, the price gap between print and digital reaffirms previous research findings that print and online newspapers coexist not as two normal goods but as a combination of a normal good and an inferior good (Chyi, 2013; Chyi & Yang, 2009).

Given such a vast price gap, readers’ migration from print to digital would result in substantial losses in subscription revenue. Digital transformation, from the reader revenue standpoint, is equivalent to “trading analog dollars for digital dimes” (Zucker, 2009, as cited in Farber, 2013, para. 1). It is also worth noting that despite these 18 newspapers gaining 290,780 digital subscribers during the pandemic, they lost 544,297 print subscribers, indicating that not everyone who discontinued the increasingly expensive print subscription turned to the same newspaper’s digital subscription despite a much lower price.

Therefore, these findings serve as a reaffirmation that news consumers are anything but platform-agnostic (Chyi & Ng, 2020; Chyi & Tenenboim, 2017; Thurman & Myllylahti, 2009). Despite the narrowing of the circulation gap as people turned to digital news for various reasons during the pandemic, this did not imply a fundamental shift in newspaper readers’ preference for the print edition in relation to the same newspaper’s paid-for digital product. These results raise a pressing question: In the post-Covid-19 era, how should newspaper firms approach digital transformation when the outcome would further weaken the industry?

6. Limitations and Future Research

The sample comprises 18 metropolitan daily newspapers operating in different newspaper markets across the US. However, prominent national newspapers, like *The New York Times*, which is known for successfully expanding its digital subscriber base, were not included in the sample. This exclusion was due to these newspapers not providing comprehensive digital data to the AAM (Edmonds, 2021; Pew Research Center, 2023). Nonetheless, *The New York Times* employs pricing strategies that are no different from those used by the 18 newspapers studied, that is, significantly increasing the subscription price for its print product while offering its digital edition at a much lower rate. Therefore, the revenue implications (i.e., exchanging analog dollars for digital dimes) generated from the findings of this study equally apply to *The New York Times* or

other newspapers adopting a similar strategy. However, *The New York Times'* national newspaper status inherently affords it a considerably larger subscriber base.

Another limitation of this study is the lack of access to cost data, as cost reduction is frequently cited as a major rationale for newspapers' endeavors toward digital transformation. However, transitioning toward an all-digital production could reduce certain variable costs, such as printing and delivery, while major fixed costs, such as content production, would remain unaffected. With digital accounting for 39–48% of newspapers' shrinking advertising revenue 2021–2023 (Pew Research Center, 2023) and merely 5% of their subscription revenue as estimated by this study, the print product remains the primary revenue source.

Research should continue monitoring news consumers' use, preferences, and willingness to pay for multiplatform news products. Newspapers must engage in a critical review of their technology-centric strategy, reinvesting in content as well as their legacy product, which has served as the lifeblood for newspapers and likely may continue this role beyond the Covid-19 era. Time is of the essence as the industry is running out of opportunities to discover effective solutions.

Conflict of Interests

The authors declare no conflict of interests.

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