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A study for France, Germany, Spain and the UK

September 2019

The impact of web traffic on revenues of traditional newspaper publishers

A study for France, Germany, Spain and the UK

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The internet era is reshaping the media industry and the way people consume and access news. Consumers use social media, search engines and news aggregators as a complementary source to newspapers' own websites to find news. Content is proliferating and available 24 hours, with publishers now being able to reach a global audience in real time, and individuals having access to an increasing number of alternative ways to access news, including print, TV and online.

Under these new consumption patterns, online news consumption is consolidating over print. Newspapers' total revenues have been declining, and their revenue mix is changing. Digital revenue is now increasingly important, and digital advertising is a main source of revenue. Bringing readers to their websites not only helps publishers to generate digital advertising revenue, but can also increase the overall likelihood of converting visitors into paying customers. For example, some media offer the possibility to pay per article read.

Despite the increasing relevance of digital revenues, publishers are not yet monetising online readers as much as they monetised print readers. In this context, publishers are considering multiple ways to leverage their quality content and increase web traffic to raise revenues, such as implementing different types of paywalls, mixed models bundling digital and print advertising, including native advertising, and below the line (BTL) marketing.

The impact of web traffic on newspaper publishers

Newspaper publishers (publishers) currently derive a material share of their online revenues from advertising and therefore their financial results are affected by their ability to bring readers to their sites. Even paywall strategies rely on traffic, as bringing more visitors increases the possibility of converting them to paying customers.

In this context, this study analyses the current contribution of total web traffic to publishers' top line revenue. Total web traffic is defined as the aggregation of "direct traffic" (traffic driven to news sites directly through a publisher webpage) and "referral traffic" (traffic driven by third party sources such as news aggregators, search engines, social networks and blogs). Top line revenue is defined as total revenues, including both digital and print revenues.

To estimate the contribution of total traffic this study develops an econometric model that isolates the impact of the key drivers of publishers' total revenues. In particular, the model includes circulation statistics to capture the contribution to print revenues; website traffic statistics and existence of a paywall to account for online revenues and the shift from print to digital news consumption; and Gross Domestic Product (GDP) per capita as a macroeconomic driver of revenues.

The econometric model uses a sample of 51 publishers across France, Germany, Spain, and the United Kingdom (UK) for the period 2015 – 2017 (see Appendix for sample details). Publishers included in the sample have both online and print publications and represent a majority of the entire market. Online-only publishers or national broadcasters such as the BBC were not included in the sample.

Estimated results from the econometric model show that there is a positive and statistically significant impact of total web traffic on revenues. The estimated coefficient associated to total web traffic suggests that 10% higher web traffic is associated, on average, with estimated 1.02% higher overall revenues. This estimate represents the average impact on publishers across the four markets during the period 2015-2017.

In order to estimate the monetary value of web traffic and referral traffic, the calculations assume a 100% reduction in web traffic based on the estimated coefficient of total web traffic from the econometric

model. This suggests that web traffic supports 10.2% of publishers' total revenue. Based on this result and the total value of the newspaper market across the four markets, it is estimated that total web traffic to publishers' websites supported €1,646m in 2018.

In addition, the study estimates that referral traffic supports 6.2% of publishers' total revenues, which amounts to €1,015m across the four markets in 2018. This is estimated on the basis that the share of referrals amounted to 61% of total traffic between 2015 - 2017, and that no statistically significant difference is found between the impact of referral and direct traffic on revenues.

Country-level estimates assume that the impacts are proportional to the digital market size (value of total web traffic) and the share of referrals in total web traffic (value of referral traffic) in each country.

Finally, using the estimated total value of web traffic and total web traffic, the average value (measured in revenue) of a web visit is estimated to range between €0.04 - €0.06 during the period analysed.

These results illustrate the monetary value of web traffic to publishers and the role it plays among the range of revenue sources publishers can leverage.

Estimated value of total web traffic
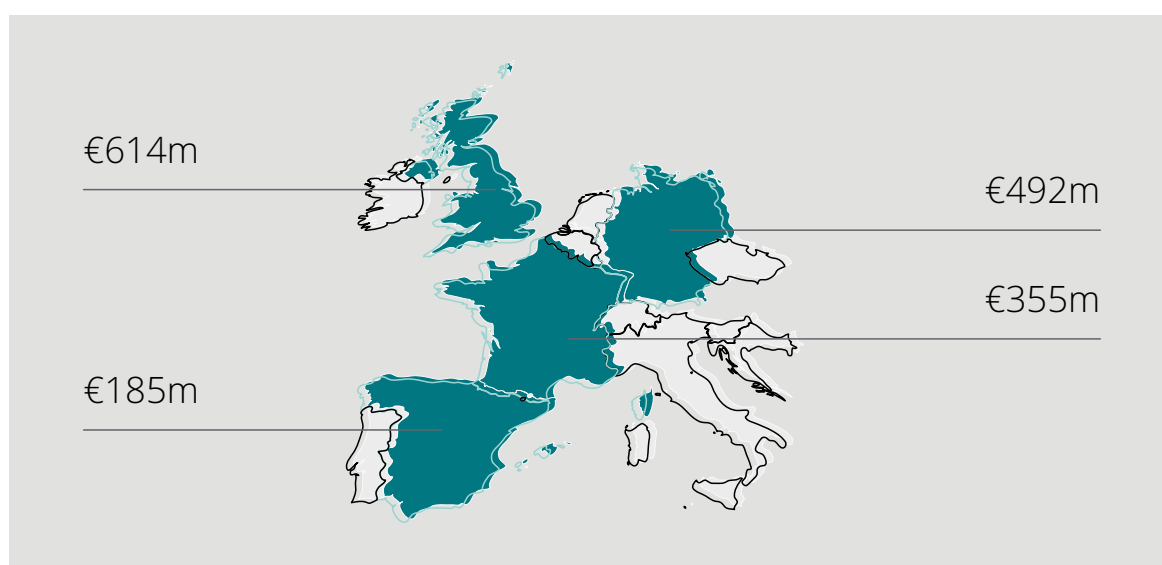
Table 1: Impact of total web and referral traffic on publishers' revenues (2018)

Country	Publishers' total revenue (€m)	Estimated value of total web traffic (€m)	Estimated value of referral traffic (€m)
France	3,111	355	228
Germany	7,812	492	220
Spain	1,366	185	112
UK	3,849	614	455
Total	**16,138**	**1,646**	**1,015**

Source: Deloitte analysis based on methodologies described in the report and publishers' total revenue. Publishers' total revenue is from PwC Global Entertainment & Media Outlook: 2018-2022. Figures may not sum due to rounding. Value measured in revenue terms.

Introduction

Google has commissioned this study to analyse the role of web traffic in newspapers' revenues. This study describes recent developments in the newspaper industry and estimates the value of web traffic to publishers in France, Germany, Spain and the United Kingdom.

Section 1 briefly describes key recent market developments in the newspaper industry. This section starts with relevant changes in consumption patterns and then focuses on the evolution of newspapers' revenue mix.

Section 2 estimates the value of web traffic to publishers in France, Germany, Spain, and the United Kingdom based on data for the period 2015 - 2017. This section describes the econometric model developed to estimate the contribution of different drivers of revenues, and presents the estimated value of web traffic across the four markets covered by the study. This study refreshes the estimates published in March 2016 using a similar econometric methodology.[1]

Further details on the methodology, the data employed, and the results obtained in the impact estimation are available in the methodology appendix.

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1   Deloitte (2016), The impact of web traffic on revenues of traditional newspaper publishers (Link).

Recent market trends in the newspaper industry

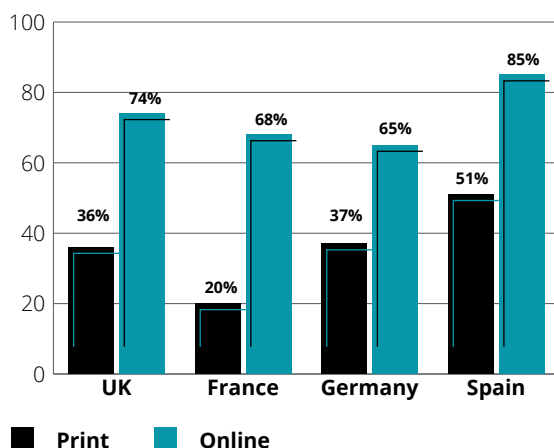Changes in news consumption patterns are affecting publisher's revenue mix, through the increase in online readership and the reduction in print circulation.[2] Web traffic is a driver for publishers to generate revenues not only from advertising, but also to increase paid subscriptions and other reader revenues.

Changes in consumption patterns

The internet era has made content available 24 hours and led to the "content era", where consumers are eager for content - between 2009 and 2018, media consumption has increased globally by 13%[3]. The internet is reshaping the newspaper industry and giving publishers the opportunity to reach a global audience in real time.

Nowadays, individuals have an increasing number of alternative ways to access news, with online news consumption consolidating over print. According to Reuters, readers now consume more news online than print.[4]

Figure 1: Sources of news by country (2018)

Source: Digital News Report 2018, Reuters. Percentage of surveyed newsreaders (anyone who has consumed news in the last month and has internet access).

Online readers consult a greater range of sources than print readers to stay up to date. For example, 92% of adults in the UK consume two or more media in the same half hour at some point during the week.[5]

In addition to newspapers' own websites, consumers are increasingly using social media, search engines and news aggregators as a complementary way to find news online. Being present on social media and news aggregators, in addition to their own websites, helps newspapers ensure their news are found by the largest possible audience across any audience touchpoint. Ultimately, the traffic volume a publisher's website attracts is expected to be driven by multiple factors, including internal factors such as the quality of content, presentation and brand value, and external factors such as discoverability of content.

If we explore country-specific characteristics, the UK sees the highest share of total revenue coming from digital and referral traffic and has the highest circulation per capita of the four countries. In contrast, German publishers are the least reliant currently on digital and referral revenue of the four countries, but experience significant consumer engagement with news as reflected in both their circulation per capita and their paywall adoption levels. France and Spain have seen a similar evolution in the mix of publishers' overall digital and print revenue and have similar share of referral in total traffic, but with Spain being still in early stages of paywall adoption compared to the other three countries.

Changes in newspapers' revenue mix

As print circulation is declining and digital traffic for news consumption is increasing, publishers' revenue mix is changing. In the countries analysed in this study

2   Web traffic has increased 23% and circulation has reduced 9% during the period 2015-2017 for the publishers in the sample.

3   See *"People consumed more media than ever last year – but growth is slowing"*: https://www.recode.net/2017/5/30/15712660/media-consumption-zenith-mobile-internet-tv

4   The results are based on a survey from Reuters where respondents were asked for their main source of news. See "Reuters Institute Digital News Report 2018.

5   See *"Adults spend almost 8 hours each day consuming media"*: https://ipa.co.uk/news/adults-spend-almost-8-hours-each-day-consuming-media

in aggregate, digital revenues grew from 9% to 15% of total revenues between 2014 and 2018.[6]

In this context, digital revenues are a key lever for publishers' business, with advertising accounting for 45% of their total digital revenue across the four markets.[7]

On news sites funded by advertising, visitors are exposed to ads when they load a page, which directly translates to revenues for the publisher. Hence, a key driver of increasing digital advertising revenue is web traffic, which has grown 23% between 2015 and 2017.[8]

During the last few years, there have been downward pressures on CPM (cost per mille impressions), in part due to the rising investment in programmatic advertising (which accounts for more than 80% of total display advertising in France, Germany or UK in 2018[9]) or the increase in ad-blocking tools usage.[10]

In this context, publishers are launching new digital monetisation models (paywalls), leveraging quality content and a combination of advertising and circulation revenue streams. The percentage of publishers with paywalls in the countries analysed has increased from 27% to 41% between 2014 and 2018.[11]

Publishers are leveraging different paywall models (from low to high content restriction) to maximize revenue from their readers, with a paid subscription model for those who want exclusive content and advertising for those who want free access to mass audience content. The best mix of paywall models for each player could differ depending on their specific traffic patterns.

In addition to paywalls, publishers are testing alternative sources of revenue around their content know how. For example, native advertising represented 20% of digital advertising revenues of news media in 2017, according to WAN-IFRA and the Native Advertising Institute.[12]

Nonetheless, even in countries with high adoption of paywalls, like France, Germany or UK advertising still represents a large part of publishers' digital revenues (more than 40% for Germany and more than 30% for UK). In Spain, where paywall adoption is still low, digital advertising represents more than 90% of digital revenue. [13]

To conclude, newspapers face the challenge of leveraging a range of revenue sources to monetise their content. Being able to bring readers to their websites not only fosters digital advertising revenue, but also increases the overall likelihood of converting them into paying customers, and therefore increase reader revenue. For example, some media offer the possibility to pay per article read. In this context, this study analyses the contribution of web traffic to publishers' revenues.

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6   PwC Global Entertainment & Media Outlook: 2018-2022, www.pwc.com/outlook

7   In Germany, this share amounted to more than 40% whereas in Spain, digital advertising accounted for more than 90% of digital revenues in 2018. See PwC Global Entertainment & Media Outlook: 2018-2022, www.pwc.com/outlook.

8   Based on the sample of publishers used for the econometric analysis. During the same period digital advertising has grown by 14% (PwC Global Entertainment & Media Outlook: 2018-2022, www.pwc.com/outlook). The number of impressions will ultimately impact revenues. In the Spanish market for example, impressions have grown 40% between 2016 and 2018. Impressions evolution in the Spanish market, source "Claves de la Información AMI 2018".

9   See *"In Europe, Programmatic Ad Spending Grows by Double Digits"*: https://www.emarketer.com/content/in-europe-programmatic-ad-spending-is-growing-by-double-digits

10   See Reuters Institute "Digital News Report 2018".

11   Based on a sample of 101 publishers across UK, France, Germany and Spain.

12   Native advertising is a marketing strategy where the advertisement matches the form and function of the media where it is displayed. In 2017, native advertising brought in 20% of overall advertising revenue for news media organisations, according to the findings from the just-published "Native Advertising Trends in News Media," the annual study conducted by WAN-IFRA and the Native Advertising Institute.

13   PwC Global Entertainment & Media Outlook: 2018-2022, www.pwc.com/outlook.

The impact of web traffic on newspaper publishers

This study estimates the value of web traffic to websites of publishers in France, Germany, Spain, and the UK.

Visitors to publishers' websites can either access content by navigating directly to the website ("direct traffic"), or can access content through a variety of referral sources which include news aggregators, search engines, social networks and blogs ("referral traffic"). The analysis has looked to quantify the impact that total web traffic (i.e. both direct and referral traffic) has on publishers' revenues, as well as the contribution from referral traffic specifically.

To quantify the impact of total web traffic on publishers' revenues, this study developed an econometric model to isolate the impact of the key drivers of publishers' total revenues, including:

- circulation statistics to capture the contribution to print revenues;

- website traffic statistics and existence of a paywall to account for online revenues and the shift from print to digital; and

- GDP per capita, to account for macroeconomic drivers of revenues.

Econometric analysis allows us to isolate the impacts of different revenue drivers in order to better estimate the contribution of individual drivers to the publishers' top lines, when controlling for other factors.

The econometric model is based on a sample of 51 publishers across France, Germany, Spain, and the UK (see Methodology Appendix for more information on the sample). The publishers included in the sample have both online and offline publications. Online-only publishers, and national broadcasters such as the BBC, which do not have a print version and often are not funded by advertising revenues, were not included in the sample. The sample covers the period 2015-2017, and contains publishers' total revenues from both their online and offline segments. Hereinafter we will refer to this metric as total revenues.

The model was developed on publisher total revenues. Disaggregated data for online and offline segments was not available on a consistent basis across publishers. The availability of separated online revenues would have made it possible to assess the impact of total web traffic on that segment only; in contrast, considering total revenues allows the analysis to examine holistic effects of website traffic or circulation across all revenue streams. The use of aggregated data does not affect the robustness of the results.

Box 1. Estimating the impact of total web traffic on publishers' total revenues[14]

The following formula specifies the relationship modelled between a publisher's revenues and its drivers, including GDP per capita, print circulation, the existence of a paywall, a proxy to control for the ratio of online to offline readers and the website traffic:

$$\log (Total\_Revenue_{it})$$
$$= \beta_1 \log (Total\_Traffic_{it}) + \beta_2 \log (Circulation_{it})$$
$$+ \beta_3 \log (Unique\_Visitors_{it} /Circulation_{it}) + \beta_4 \log (GDPpc_{it})$$
$$+ \beta\_5 \ Paywall_{it} + x'_{it} \ \theta + u_{it}$$

This relationship was estimated using a fixed effects panel data model. Fixed effects models account for variables not included in the formula above that are constant over the time period considered. For example, they may include the overall quality of a publication, its readers' demographics, its format, and whether its print edition is distributed nationally, regionally, or locally.

The fixed effects model produces estimates for the β coefficients that capture the relationship between the variables on the right-hand side of the equation and the dependent variable, i.e. "*log(Total_Revenue)*". In the specification detailed above, the coefficient associated to *"log(total traffic)"*, β_1 , can be interpreted such that with 1% higher traffic, overall revenues are expected to be $\hat{\beta}_1$% higher on average, holding all else equal.

Based on the econometric analysis, the estimated model suggests that 10% higher web traffic is associated, on average, with estimated 1.02% higher overall revenue.[15] This estimate represents the average impact on publishers across the four markets during the period 2015-2017.

Between 2015 and 2017, across the four countries covered in this study in aggregate:[16]

• Direct traffic to publishers' websites represented 39% of total visits. These visits came from users who navigate to the site directly, either by typing the URL into their address bar or by following their bookmarks.

• The remaining 61% of visits to publishers' websites were referral traffic. This traffic was referred via other sources that may include links via search engines, news aggregators or on blogs or social media, which users follow to the news sites.

We have tested whether referral and direct traffic have different impacts on publishers' revenue. To do so, alternative models have been estimated based on the model described above and including the share of direct and referral traffic over total traffic. In all models, the share of referral or direct traffic over total traffic was not statistically significant[17]; suggesting that a visit by a visitor referred from another website may be on average as valuable as a visit from a visitor

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14   Definitions of the variables and the methodology are described in the Appendix.

15   The estimate is significant at 95% level.

16   Comscore data. This analysis uses only desktop traffic data since multiplatform data split by source of traffic was not available from Comscore for the years covered in the analysis. In 2018 desktop traffic represented 54% of total traffic. However, results from Reuters Institute (Digital News Report 2018), which include both mobile and desktop consumption, show that the split between direct and referral traffic is in line with Comscore results. On average across the four countries, Reuters Institute data shows referral and direct traffic to be 65% and 35%, respectively.

17   This analysis is based on the split of desktop traffic between direct and referral traffic, because no information is available on the split of total traffic between those sources. However, as described in footnote 16 Reuters Institute data, which includes mobile and desktop, shows that the split between direct and referral is in line with Comscore data on average across the countries.

who comes in directly.[18] Nonetheless, this result is an average across publishers and for the analysed period. Hence, the results may vary for publishers with specific characteristics, such as niche specialist content or regional newspapers.

On this basis, the share of referral traffic over total web traffic as described above is then used to estimate that, on average, 10% higher traffic referred to publishers' websites is associated with an estimated 0.62% higher overall revenue during the years covered in the analysis.

To estimate the monetary value (measured in revenue terms) of total traffic to publishers' websites, the calculations use the estimated coefficient and assume a 100% decrease in web traffic[19]. Results suggest that an estimated 10.2% of publishers' total revenues are supported by web traffic, and an estimated 6.2% of publishers' total revenues are supported by referral traffic.[20] These figures represent an average effect across the publishers and years covered in the analysis. Web traffic as well as referral traffic could represent a higher share of revenues for publishers with higher online presence and vice versa.[21]

18   Analysis of the Comscore data shows that desktop visitors viewed 4.5 pages per visit on average, with desktop visitors who accessed news directly or via referral sites viewing ± 18% pages per visit relative to the average, respectively. Even though average page views per visit appear to be higher for direct traffic relative to referral traffic in desktop, additional page views during a visit do not necessarily translate into a proportional revenue increase, as publishers tend to have more impressions in the front page of their websites. Accordingly, this study finds no statistically significant difference in the contribution of both sources to total revenue.

19   This methodology is used to translate the econometric results into an absolute contribution to revenue.

20   Deloitte analysis. While the effect of increases and decreases of web traffic on revenues do not necessarily have to be the same, the estimate is based on a panel dataset, which includes different levels of web traffic above and below the average in the sample. See the Appendix for complete results of the econometric analysis. As with any econometric model, the model estimates the impact of marginal changes in web traffic, across the publishers and years in the sample. The magnitude of this impact could be different with large changes in web traffic.

21   These findings are consistent with publishers generating approximately 12% of their revenues via their online channels, including digital advertising and paywall revenue, between 2015 and 2017 (Deloitte analysis using PwC Global Entertainment & Media Outlook: 2018-2022, www.pwc.com/outlook data). Through the econometric model described in this section, paywall is estimated to contribute 3.4% of revenues on average for the companies with a paywall in place in the sample, after controlling for other factors (see model described in the Appendix). Since 42% of the companies in the sample have a paywall of some kind, overall paywall contribution is estimated to be 1.4% across the sample. Adding this figure to the 10.2% estimated contribution of web traffic results in an 11.6% contribution of total digital revenue sources to total news publisher revenue, which is close to the estimated percentage of digital revenue over total revenue for the overall market referenced above.

This result was then combined with the total size of the newspaper market across the four countries. The calculation assumes that the relationship estimated in the sample of 51 publishers extends to the whole market.[22] As a result, total web traffic to publishers' websites has been estimated to support €1,646m of revenue; of which referral traffic supports an estimated €1,015m across the four markets in 2018.[23]

The estimated contribution of both total and referral web traffic by country is listed in Table 2. The relative value of web traffic and referral contributions in each market is driven by the differences in the sizes of the digital newspaper markets, and the share of referrals in total traffic in each country.[24]

The table below shows the estimated contribution of web traffic to publishers' revenue. These revenues could have been generated from ads supplied by any provider, or any source of monetisation that is based on web traffic including advertising and paywall revenue driven by the increase in website traffic. The results of the analysis do not seek to measure what would have happened if web referral services did not exist.

Finally, since no statistically significant difference is found between referral and direct traffic impacts as described above, the value (measured as revenue) of a visit is derived by dividing the estimated economic value of total visits by the total number of visits per year for the publishers in the sample. This methodology leads to an estimated range between €0.04 to €0.06 per visit. This range represents the average revenue per visit across the four markets for the years covered in the sample.

Table 2: Impact of total web and referral traffic on publishers' revenues (2018)

Country	Publishers' total revenue (€m)	Estimated value of total web traffic (€m)	Estimated value of referral traffic (€m)
France	3,111	355	228
Germany	7,812	492	220
Spain	1,366	185	112
UK	3,849	614	455
Total	**16,138**	**1,646**	**1,015**

Source: Deloitte analysis based on methodologies described in the report and publishers' total revenue. Publishers' total revenue is from PwC Global Entertainment & Media Outlook: 2018-2022. Figures may not sum due to rounding. Value measured in revenue terms.

22   This assumption is made on the basis that the selected sample covers a material share of the total market in those four countries (c. 70% based on total market estimates in the PwC Global Entertainment & Media Outlook: 2018-2022, www.pwc.com/outlook), as well as publishers of different sizes (35% are small publishers, 39% medium size publishers and 25% large publishers) and geographical coverage (61% are national publishers and 39% regional publishers). See the Appendix for further details.

23   The holistic nature of the econometric analysis means that the overall contribution includes any shares of revenues from advertising, paywalls and other means of monetisation that are driven by traffic.

24   A sensitivity is provided in the Appendix, where the aggregate impact is distributed by country on the basis of the country's share of total revenues across the 4 countries and the average share of referrals in total traffic across the 4 countries, in line with the March 2016 study.

Appendix: Methodology

This study estimates the value of web traffic to publishers in France, Germany, Spain, and the UK. To do so, the study develops an econometric model to isolate and measure the effects that revenue drivers have on publishers' total revenues.

This study uses publishers' historical data and it does not seek to develop any counterfactual scenarios or answer any "what if?" questions related to the subject.

The publishers included in this analysis differ in their business models, product offerings, or readers' demographics; characteristics that make the estimation process complex. The techniques used in this study have been selected to most accurately tackle these challenges and account for publisher-specific characteristics.

The following sections outline the approaches employed in the estimation and provide sources for the underlying data and explanations for any assumptions.

Econometrics methodology

Econometric modelling techniques were used to identify the impact that total web traffic has had on publishers' revenues. Econometric analysis allows us to isolate the impacts of different revenue drivers in order to better estimate their contribution to the publishers' total revenues, after controlling for other factors impacting total revenues. This is an advantage compared to a traditional "market sizing" approach as it allows to understand the underlying contribution of each factor.

Sample

The analysis used a sample of 51 publishers across four European markets: France, Germany, Spain, and the UK for the period 2015-2017. These publishers were selected based on data availability and the following criteria:

- Only publications with both a print and an online component were included in the sample. Online-only publishers were not considered, nor were the national broadcasters in the four markets, such as France TV, NDR, RTVE, and the BBC, that are otherwise popular sources of online news but do not have print editions and often are not funded by advertising revenues.

- Companies with divisions unrelated to newspaper publishing were excluded, unless their publishing divisions had separate financial results available. The inclusion of these publishers would have introduced noise into the model from the non-publishing revenues, which are not relevant to this study.

- In addition to these exclusions, where data for some publishers was unavailable or inaccurate, these publishers were not included.

The size of the sample varied across years due to missing values for some publishers. Different sample sizes did not affect the reliability of the estimation under the fixed effects methodology, which is described below.

Table 3: Sample size by year and country

Country	2015	2016	2017
France	11	12	11
Germany	12	12	12
Spain	15	15	15
United Kingdom	12	12	11
Total	**50**	**51**	**49**

Source: Deloitte Analysis

Table 4: Other sample characteristics

	Total	Small	Medium	Large
Split by size	51	35%	39%	25%

	Total	National	Regional	
Geographical coverage	51	61%	39%	

	Total	Group	Standalone	
Belonging to a media group	51	16%	84%	

Source: Deloitte Analysis

Data

The results presented in this report are based on free publically available data, as well as data obtained from Comscore, CapitalIQ, abc.co.uk and the OJD. The table below describes the variables included in the analysis.

Variable	Description	Source
Revenue	Total revenues per year of publishers in the sample in USD. Total revenues are composed of both print and online revenues. For cases where a publisher is a holding company for various businesses, revenues have been disaggregated for the individual publication or group of publications using annual report data where available. Revenues in local currencies were converted into USD using the average exchange rate for the given year.	Informa, Amadeus, Capital IQ, companies' annual reports, OECD
Total visits	Average number of total visits (both directly and from referral sites) a publisher's website has per month.	Comscore
Unique visitors	Average number of unique users visiting a publisher's website per month.	Comscore
Circulation	Average number of print copies distributed per issue and year.	Country circulation bureaus
GDP per capita	A metric of the value of a country's economy per person living in the country. GDP is defined as the total value added by producers in a country	World Bank
Paywall	Represents whether a publisher has any type of Paywall in place. For each publisher and year the variable takes the value 1 if a Paywall is in place and 0 otherwise.	Own website research

The Model

To arrive to the final model, we followed an iterative process of model selection based on economic theory, market characteristics and the statistical properties of each model.

As a result, the underlying equation that supports the estimations in the study is the following:

$$\log (Total\_Revenue_{it})$$
$$= \beta_1 \log (Total\_Traffic_{it}) + \beta_2 \log (Circulation_{it})$$
$$+ \beta_3 \log (Unique\_Visitors_{it}/Circulation_{it}) + \beta_4 \log (GDPpc_{it})$$
$$+ \beta\_6\ Paywall_{it} + x'_{it}\ \theta + u_{it}$$

Where:

- $Total\_Traffic_{it}$ represents the average number of total visits (accounting for more than one visit from the same Unique Visitor) a website of publisher i has per month during the year t;

- $Circulation_{it}$ represents the average number of print copies in units for the selected publisher i and year t;

- $Unique\ visitors_{it}/Circulation_{it}$ is the ratio that represents the proportion of online readers over print circulation for a given media i and time t;

- $GDP\ pc_{it}$ represents the Gross Domestic Product per capita for the country where the newspaper i is based in time t;

- $Paywall_{it}$ is a dummy variable that takes value 1 the publisher has any type of Paywall is in place;

- x'_{it} is a vector of control variables such as year dummies, to account for the negative trend that industry's revenues have followed, and company-specific dummies to control for relevant outliers.

We have estimated the model using a fixed effects panel data model. Fixed effects models account for variables not included in the formula above that are constant over the time period considered. For example, they may include the overall quality of a publication, its reader demographics, its format, and whether its print edition is distributed nationally, regional, or locally.

The model produces estimates for the coefficients ($\hat{\beta}$) that capture the marginal impact that the variables on the right-hand side of the equation have on the dependent variable (log of revenues). In the specification detailed above, the estimated coefficient of log(total traffic) $\hat{\beta}_1$, can be interpreted such that a 1% change in total traffic to a publisher's website is associated on average with a $\hat{\beta}_1$% change on average in total revenues, holding all else equal.

Results

The model specified above uses annual data from 2015-2017 for a sample of 51 publishers across France, Germany, Spain, and the UK. Model results capture the average effect of the independent variables, i.e. the right-hand side of the equation, on the dependent variable, i.e. log of revenues, across publishers in the sample.

The estimates of the coefficients are detailed in the table below.

Table 5: Econometric results

Fixed Effects Model
Number of observations: 150
Number of publishers: 51
Time period: 2015 - 2017

Independent variables	Coefficients
log(total_traffic)	0.102**
log(circulation)	0.283*
log(unique visitors / circulation)	-0.096*
log(GDP per capita)	1.204***
paywall	0.034*
2016	-0.037***
2017	-0.085***

*** Significant at 1%
** Significant at 5%
*Significant at 10%
Standard errors were clustered on publishers

Source: Deloitte Analysis

The estimated coefficient of log(total traffic) suggests that, holding all else equal, 10% higher web traffic is associated with an estimated 1.02% higher overall revenue on average. In the sample of 51 publishers, the average share of referral traffic relative to total traffic is 61% across all three years. Therefore, based on the argument detailed in the preceding section, the impact of 10% higher referral traffic from other sites is an estimated 0.62% higher overall revenue on average.

To estimate the monetary value of referral traffic to publishers' websites, the estimated coefficient was used to assess the impact of a 100% decrease in total traffic. The results imply that an estimated 10.2% of publishers' total revenues are supprted by web traffic, and an estimated 6.2% of publishers' total revenues are supported by referral traffic.

The contribution of total web traffic and referral traffic to publishers is listed in Table 6 by country. The table shows two alternative estimation approaches, a baseline and an alternative approach, which are described as follows:

- **The baseline approach,** presented in the main body of the report, attributes the aggregated impact to each country based on country specific characteristics of the digital news market (namely the country's share of total digital revenue across the four countries in the sample, and the country's share of referrals vs direct traffic). This approach assumes that web traffic is likely to impact digital revenues more directly than other revenue streams.

- **The alternative approach** provides a sensitivity to the baseline results. In this approach, the overall impact is attributed to each market based on the country's share of total revenue across the four markets and the average share of referrals vs direct traffic across the sample. This is consistent with the specific nature of the econometric model, which measures average impacts across the geographies.

Table 6: Estimated total and referral traffic value (baseline and sensitivity)

Country	Estimated value of total web traffic (€m) - Baseline	Estimated value of total web traffic (€m) - Sensitivity	Estimated value of referral traffic (€m) - Baseline	Estimated value of referral traffic (€m) - Sensitivity
France	355	317	228	193
Germany	492	797	220	486
Spain	185	139	112	85
UK	614	393	455	239
Total	**1,646**	**1,646**	**1,015**	**1,003**

Source: Deloitte analysis based on methodologies described in the report and publishers' total revenue. Publishers' total revenue is from PwC Global Entertainment & Media Outlook: 2018-2022. Figures may not sum due to rounding. Value measured in revenue terms.

The estimated coefficient of *log(circulation)* shows that print circulation has a positive impact on publishers' revenues. Hence, revenues are expected to be higher with higher circulation. [25]

As mentioned before, the variable *log(uvnique visitors / circulation)* measures the proportion of online readership over print circulation for a given media, which could be used as a proxy for media audience structure. The estimated negative coefficient associated to this variable suggests that publishers with a higher proportion of online readers have, on average, less revenue than publishers with a higher proportion of print readers. This is consistent with the finding that a digital user generates less than 10% of the revenue of a print reader.[26]

The estimated positive coefficient associated to the *GDP per capita* suggests that the macroeconomic cycle of the country where the publisher is based has a positive impact on revenues. As the economic theory suggests, as the citizens of a country grow wealthier, publishers may attain higher revenues. The countries in the sample show different GDP per capita patterns over the analysed period.

The positive coefficient on the variable *Paywall* indicates that media with a paywall in place have obtained on average higher revenue over the years covered in the sample. Holding all else equal, a company with a paywall in place is estimated to earn 3.4% higher revenue on average.

Negative coefficients on the variables 2016 and 2017 indicate a declining trend in publishers' revenues over time. This finding is consistent with the general market trends discussed in the main body of the report.[27]

Robustness checks

To check robustness of the results, alternative specifications and panel data models were also estimated, including a random effects model with multiple publisher characteristics to control for other influences on revenues, which is not necessary under the fixed effects model. Under the Random Effects model the estimated coefficient of *log(total traffic)* is 0.108, very similar to the estimation under the fixed effects specification. Also different sample sizes were tested with minor impact on coefficients. The traffic coefficient ranged between 0.101 and 0.112.

Cozzolino and Giarratana (2014) suggests that endogeneity may have been introduced with the inclusion of both circulation and total traffic variables in the model.[28] Additional specifications omitting circulation have been estimated. Differences between the coefficients of the alternative specification and the original specification were not material.

Calculating the average value of a visit

The average value of one visit was derived from the estimated revenue impact for the companies in the sample and their web traffic following the next equation:

$$\frac{\textit{Estimated revenue impact}}{\textit{total traffic}} = \textit{average value of a visit}$$

We derive the average value of a visit by dividing the estimated economic value of total visits by total traffic for the publishers in the sample.

The estimated average value of a visit ranges between €0.04 and €0.06. This range represents the average value across the four markets for the years covered in the sample.

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25   The range of circulation values in our sample is narrower than that of web traffic and this makes the coefficient less likely to represent changes of a large magnitude.

26   See "Reuters Institute Digital News Report 2018"

27   Traditionally publishers do not incur in recurring advertising expenditures. Companies in the media industry rather promote specific marketing campaigns or engage in media barter agreements, mainly with other media in their own group. Therefore, this variable is not considered material for the analysis, and accordingly it has not been included in the model. Media barter is a marketing technique based on the placement of advertising in a media in exchange for the goods or services from the advertised company. In the case of the media industry, this agreement is instrumented as an exchange of ad placements.

28   Cozzolino and Giarratana (2014), "Mechanisms of Value Creation in Platform Markets"

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