Web Appendix to "Paywalls: Monetizing Online Content"

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Appendix A - Robustness Checks

1) Estimating the spillover effect on the print newspaper using a panel regression

	Top 25 DMAs, USA Today as control group				Top 25 DMAs, WSJ as control group			
DV=	Weekday circulation share (%)		Weekend circulation share (%)		Weekday circulation share (%)		Weekend circulation share (%)	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE
NYT x Paywall	0.62**	0.10	0.55**	0.13	0.42**	0.06	0.21*	0.09
DMA dummies, DMA specific linear and quadratic time trends		√		√		√		√
R^2	0.58		0.49		0.84		0.74	

** p<0.01, *p<0.05, + p<0.1; standard errors are clustered by DMA

Table 1: Robustness Check: estimating the spillover effect on the print newspaper, top 25 DMAs, panel regression

2) Examining the impact of excluding WSJ from the donor pool (set of control group newspapers)

	40 pages - including WSJ										40 pages - excluding WSJ									
	ln(Unique Visoitors)		ln(Pages)		ln(Visits per visitor)		ln(Pages per visitor)		ln(Duration per visitor)		ln(Unique Visitors)		ln(Pages)		ln(Visits per visitor)		ln(Pages per visitor)		ln(Duration per visitor)	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Light x NYT x paywall	-0.154**	0.061	-0.063	0.132	-0.039	0.045	0.060	0.082	0.237*	0.113	-0.183**	0.059	-0.126	0.133	0.070	0.122	0.033	0.084	0.189+	0.098
Heavy x NYT x paywall	-0.148	0.138	-1.994**	0.202	-0.988**	0.133	-1.667**	0.171	-1.783**	0.198	-0.391**	0.079	-2.041**	0.206	-1.024**	0.115	-1.712**	0.182	-1.900**	0.213
#Obs-treated	1025																			
#Obs-control	4100																			

** p<0.01, *p<0.05, + p<0.1
Standard errors are obtained from a placebo test, and are bootstrapped with 1000 replications.
Two-way fixed effects for DMAxnewspaper and month are included. The treatment effect is evaluated at the mean counterfactual.

Table 2: Assessing the impact of excluding WSJ from the donor pool

3) Assessing the impact of the NYT paywall in the short term (one quarter, two quarters after paywall rollout)

SHORT TERM EFFECT OF THE PAYWALL

	20 pages, first month										20 pages, first two months									
	ln(Unique Visitors)		ln(Pages)		ln(Visits per visitor)		ln(Pages per visitor)		ln(Duration per visitor)		ln(Unique Visitors)		ln(Pages)		ln(Visits per visitor)		ln(Pages per visitor)		ln(Duration per visitor)	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Light x NYT x paywall	0.125	0.083	0.232	0.144	0.056	0.052	0.216*	0.104	0.318*	0.150	0.069	0.073	0.354*	0.164	0.051	0.054	0.203^{+}	0.108	0.299*	0.142
Heavy x NYT x paywall	-0.287**	0.065	-1.301**	0.171	-0.428**	0.122	-0.806**	0.160	-0.869**	0.208	-0.318**	0.064	-1.434**	0.153	-0.544**	0.123	-0.960**	0.162	-0.952**	0.210
#Obs-Treated	375										400									
#Obs-Control	1875										2000									

	20 pages, first three months										20 pages, first six months									
	ln(Unique Visitors)		ln(Pages)		ln(Visits per visitor)		ln(Pages per visitor)		ln(Duration per visitor)		ln(Unique Visitors)		ln(Pages)		ln(Visits per visitor)		ln(Pages per visitor)		ln(Duration per visitor)	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Light x NYT x paywall	0.084	0.062	0.160	0.153	0.069^{+}	0.043	0.213*	0.099	0.339**	0.139	0.048	0.055	0.159	0.157	0.093*	0.042	0.260**	0.090	0.404**	0.125
Heavy x NYT x paywall	-0.319**	0.062	-1.436**	0.167	-0.546**	0.127	-0.961**	0.161	-0.955**	0.205	-0.383**	0.066	-1.645**	0.204	-0.659**	0.170	-1.075**	0.208	-1.074**	0.228
#Obs-Treated	425										500									
#Obs-Control	2125										2500									

** p<0.01, *p<0.05, + p<0.1

Standard errors are obtained from a placebo test, and are bootstrapped with 1000 replications.
Two-way fixed effects for DMAxnewspaper and month are included. The treatment effect is evaluated at the mean counterfactual.

Table 3: Short term effect of the NYT paywall on Online Visitation of users with varying activity levels, aggregate data, generalized synthetic control

4) Examining cross-newspaper subtitution - Two-way frequency table of visitation behavior between the treated and control newspapers (visits and duration on the website)

# Users		NYT △Visits $_{(Pre-Post)}$				NYT △Visits $_{(Pre-Post)}$		
	USAT	Increased	No Change	Decreased	WP	Increased	No Change	Decreased
Control group $\triangle_{(Pre-Post)}$	Increased	30	57	0	Increased	23	40	0
	No Change	219	72208	1571	No Change	225	72424	1559
	Decreased	0	525	564	Decreased	1	326	576
	WSJ	Increased	No Change	Decreased	CT	Increased	No Change	Decreased
Control group $\triangle_{(Pre-Post)}$	Increased	22	20	0	Increased	3	18	0
	No Change	227	72598	1767	No Change	246	72373	1919
	Decreased	0	172	368	Decreased	0	399	216
	NYDN	Increased	No Change	Decreased				
Control group $\triangle_{(Pre-Post)}$	Increased	22	23	0				
	No Change	227	72264	1773				
	Decreased	0	503	362				

Table 4: Two-way frequency table of change in newspaper visitation from pre to post
Exploring Substitution across Treated and Control Newspapers

# Users		NYT △Duration $_{(Pre-Post)}$				NYT △Duration $_{(Pre-Post)}$		
	USAT	Increased	No Change	Decreased	WP	Increased	No Change	Decreased
Control group $\triangle_{(Pre-Post)}$	Increased	48	127	4	Increased	54	137	4
	No Change	873	65974	5445	No Change	854	66189	5280
	Decreased	13	1626	1064	Decreased	26	1401	1229
	WSJ	Increased	No Change	Decreased	CT	Increased	No Change	Decreased
Control group $\triangle_{(Pre-Post)}$	Increased	46	65	5	Increased	10	79	3
	No Change	878	67035	5738	No Change	920	66736	6031
	Decreased	10	627	770	Decreased	4	912	479
	NYDN	Increased	No Change	Decreased				
Control group $\triangle_{(Pre-Post)}$	Increased	81	236	17				
	No Change	839	65840	5663				
	Decreased	14	1651	833				

Table 5: Two-way frequency table of change in newspaper visitation from pre to post
Exploring Substitution across Treated and Control Newspapers

5) Examining possible substitution between the treated and control newspapers by considering behaviors of only those users who accessed EITHER the treated or one of the control newspapers in the pre or post periods

	20 pages						30 pages						40 pages					
	ln(Visits per visitor)		ln(Pages per visitor)		ln(Duration per visitor)		ln(Visits per visitor)		ln(Pages per visitor)		ln(Duration per visitor)		ln(Visits per visitor)		ln(Pages per visitor)		ln(Duration per visitor)	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE
NYT x paywall x Light	-0.010	0.043	0.197**	0.025	0.414**	0.027	0.064*	0.018	0.137**	0.025	0.336*	0.027	0.041*	0.018	0.093**	0.024	0.284**	0.027
NYT x paywall x Heavy	-0.742**	0.002	-1.207**	0.003	-1.300**	0.005	-0.629**	0.002	-1.000**	0.002	-1.079**	0.005	-0.435**	0.001	-0.735**	0.002	-0.805**	0.002
#Obs-treated	1025																	
#Obs-control	5125																	

** p<0.01, *p<0.05, + p<0.1
Standard errors are obtained from a placebo test, and are bootstrapped with 1000 replications.
Two-way fixed effects for DMAxnewspaper and month are included. The treatment effect is evaluated at the mean counterfactual.

Table 6: NYT paywall on Online Visitation - Restricted sample of exclusive users created by eliminating users who accessed both NYT and any one of our control newspapers, from the sample, in either the pre or the post period.

6) Examining possible substitution behaviors between treated and control print newspapers

# Users		NYT △Wkday circ$_{(Pre-Post)}$				NYT △Wkday circ$_{(Pre-Post)}$		
	USAT	Increased	No Change	Decreased	WSJ	Increased	No Change	Decreased
Control group $\triangle_{(Pre-Post)}$	Increased	147	29	11	Increased	131	31	10
	No Change	2	8	0	No Change	14	7	0
	Decreased	1	1	0	Decreased	5	0	1

Table 7: Two-way frequency table of change in newspapers' weekday circulation from pre to post Exploring Substitution across Treated and Control Newspapers

7) Information on different subscription options offered by the NYT after the paywall:

	Subscription Option 1	Subscription Option 2	Subscription Option 3
DIGITAL	$3.75 per week for web + mobile app access ($195/year)	$5 per week for web + iPad app access ($260/year)	$8.75 per week for all-access plan ($455/year)
PRINT$^{\sharp}$	$5 for Sunday only home delivery	$6.5 per week for weekend home delivery	$11.5 per week for daily home delivery

♯ - all NYT print subscriptions were provided free digital access - https://www.theatlantic.com/business/archive/2011/03/new-york-times-erects-pay-wall/348883/

Table 8: Subsctiption options offered by the NYT around the time of the paywall

7) Examining the impact of promotional ad spending by the NYT:

		Excluding ad spending		Including ad Spending			
				Effect of the paywall		Effect of Prom. Focused Ad Spending	
		Est.	SE	Est.	SE	Est.	SE
LIGHT	Unique Visitors	-0.117*	0.058	-0.103^{+}	0.056	0.026	0.034
	Pages	0.095	0.131	-0.324	0.251	0.126	0.090
	Visits per visitor	-0.040	0.050	-0.099	0.078	-0.045	0.039
	Pages per visitor	0.142	0.097	0.179^{+}	0.093	0.068	0.060
	Duration per visitor	0.302**	0.115	0.352**	0.119	0.011	0.072
HEAVY	Unique Visitors	-0.751**	0.115	-0.760**	0.117	-0.016	0.037
	Pages	-3.110**	0.373	-3.067**	0.374	0.082	0.093
	Visits per visitor	-0.788**	0.165	-0.828**	0.191	0.071	0.053
	Pages per visitor	-1.508**	0.310	-1.284**	0.228	0.085	0.058
	Duration per visitor	-1.806**	0.393	-1.510**	0.323	0.099	0.070

** p<0.01, *p<0.05, + p<0.1 ; Heavy classification based on 20 pages of NYT pre-paywall usage.
Standard errors are obtained from a placebo test, and are bootstrapped with 1000 replications.
Two-way fixed effects for DMAxnewspaper and month are included. The treatment effect is evaluated at the mean counterfactual.

Table 9: Examining the role of subscriber-acquisition related promotions by newspapers

8) Assessing generalizability of the effect of the paywall on NYT, by investigating the impact of the paywall launched by the LAT in Mar 2012:

	ln(Unique Visitors)		ln(Pages)		ln(Visits per Visitor)		ln(Pages per Visitor)		ln(Duration per Visitor)	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE
LAT x paywall x Light	0.066	0.084	0.126	0.145	0.012	0.051	0.004	0.108	0.150	0.125
LAT x paywall x Heavy	-0.272**	0.112	-0.644**	0.168	-0.111**	0.079	-0.204**	0.109	-0.232**	0.127
N-treated	1025									
N-control	5125									

** p<0.01, *p<0.05, + p<0.1
Standard errors are obtained from a placebo test, and are bootstrapped with 1000 replications.
Two-way fixed effects for DMAxnewspaper and month are included. The treatment effect is evaluated at the mean counterfactual.

Table 10: Assessing Generalizability: examining the effect of the LA Times Paywall, median split, generalized synthetic control.

9) Exploring the spillover effect of the LAT paywall on its print circulation

WP as Control group	Weekend		Weekday	
	Est.	SE	Est.	SE
Paywall	-6.32**	0.60	-4.72**	0.94
LAT x Paywall	4.58**	0.87	4.79**	1.36
Zipcode specific linear and quadratic trends	√		√	
Newspaper dummies	√		√	
R^2	0.89		0.84	

** p<0.01, *p<0.05, + p<0.1

Table 11: Assessing Generalizability: examining the effect of the LA Times Paywall on print readership, panel regression.

Appendix B - Revenue Impact of the NYT paywall

As discussed earlier, the paywall resulted in lower engagement in online content, especially among heavy users. Lower engagement and traffic leads to a lower quantity of ad impressions that can be served on the newspaper's website. Thus, relative to the period before the paywall, this will lead to lower advertising revenue. However, as a result of the paywall, the newspaper is likely to have richer information on subscribing visitors, increasing its ability to serve *targeted* ads. Moreover, subscribing visitors, by virtue of their revealed willingness to pay for digital content, are likely to be more attractive to advertisers. In the absence of the paywall, advertisers would not have been able to directly identify such high willingness to pay users. Therefore, the paywall can potentially help a newspaper charge higher ad rates per impression (typically measured in terms of cost per mille or CPM) as a result of the improved quality of the served ad impressions. Therefore, the net effect of paywalls on online advertising (which we term the *indirect* effect) is likely to depend on the relative magnitudes of the changes in the quantity and quality of ad impressions subsequent to the paywall.

In order to study this we use the online advertising data described above. Our data consist of advertising expenditure and advertising impressions sourced from comScore's AdMetrix package. We first provide a plot of the temporal evolution of ad revenues for the NYT as well as for the broad category (total ad revenues invested in online newspapers in the U.S., as reported by the Newspaper Association of America) in Figure 1. We see that NYT's total digital ad revenue increased in the period following the paywall, just as the category spending did. More specifically, we find that while the NYT's digital advertising grew at an average annual rate of 169.4% between 2009 and 2013, the corresponding increase for online newspaper advertising was about 9.08% during this period.

The average online ad rate (CPM or the cost per 1000 impressions) for the NYT increased by around 32% in the period following the paywall. As such, this is in contrast to the decrease in CPMs experienced by online display advertising during this period (Johnston, 2014). Prima facie, this might indicate that advertisers were willing to pay a premium for ads placed at NYTimes.com, possibly as a result of superior quality of ad impression served on

the website. However, the fact that CPMs increased post-paywall does not necessarily imply that advertisers were willing to pay higher rates per impression - it is also conceivable that the NYT increased its CPMs in anticipation of the changes in the quality of impressions, although advertisers did not perceive such quality improvements.

In order to understand the impact of the paywall on NYT's online ad revenues, we run two sets of analyses: First, we track online advertising in a panel regression of logged online ad expenditure at the NYT considering corresponding ad spend on all US online newspapers as a comparison group (data we compiled from naa.org). This allows us to track the evolution of NYT's online advertising relative to that experienced by the overall category of online newspaper advertising. In the second specification, we regress a proxy for the number of digital ad impressions served at the NYT (in logs) on a paywall indicator, after controlling for time trends and seasonality in advertising.

Formally, we used the following specification:

$$A_{nt} = \alpha I_{\tau} + \theta_1 t + \theta_2 t^2 + \nu_t + \epsilon_{nt}, \tag{1}$$

where the dependent variable A consists of the logarithm of the ratio of total online ad spending (in \$) on the NYT in each month t to the corresponding category level ad spending (advertising spending on all online newspapers in the U.S.) in the first specification, and the logarithm of ad impressions for the NYT in the second specification.

In essence, the first specification allows us to track how NYT ad revenues evolved in relation to that of U.S. online newspapers. We control for temporal changes in advertising by using a parametric function of linear and quadratic month trends. We also include month of the year fixed effects to capture seasonal variations in advertising behavior. In addition, we explore the impact of including separate month of the year fixed effects for the pre/post periods, as a robustness test of whether the paywall motivated seasonal shifts in ad spending levels on the NYT. The coefficient α captures the effect of the paywall on NYT's ad revenues, or the *indirect effect*.

We present the results in Table 12. We find that the paywall had a negative effect of around 48.90% (calculated as [exp(-0.67)-1] from the estimate in column (1) in Table 12) of post-period ad expenditure, which remains consistent when we consider a shorter time window before and after the paywall (see Table 13). Results from the second model specification indicate that the paywall had a significant impact on the number of advertising impressions on the NYT website.[1] Considered against the backdrop of the finding that the paywall had a negative impact on the number of impressions served following the paywall (on account of the loss of the heavy user segment), one can rationalize the drop in advertising as arising from the reduced *quantity* of impressions - in line with the results from the second specification. This suggests that the effect of the paywall on online advertising due to changes in quantity of impressions served (the *quantity effect*) dominated the corresponding change to advertising due to the *quality effect*.

Overall, a decrease in circulation/readership can lead to lower advertising, especially in markets where advertising is known to be closely linked to the size of the reader base - such as newspapers (Rochet and Tirole, 2003; Fan, 2013; Pattabhiramaiah et al., 2018). This resulting lower cash flow can hamper the newspaper's ability to invest in quality. The resulting decline in quality can lead to a further decline in readership, thereby driving the quality-driven circulation spiral (Gabszewicz et al., 2007). In our context, if the paywall decreased online readership and led to lower online lower advertising, this might result in lower quality of content and decrease readership further.[2] While our data do not allow us to comment on the exact mechanism behind the circulation spiral, as we discuss below, the paywall had a net positive impact on NYT's revenues. Therefore, we do not foresee any adverse changes in the quality of online content because of the paywall.

In sum, our results of lower online engagement of NYT's readers after the paywall are consistent with the observed decrease in online advertising. An essential caveat to these results may be in order. Our choice of NYT was motivated mainly based on media reports of its success with executing a paywall. While these media reports did not discuss specifics of the advertising gains for NYT from the paywall, our results appear to be inconsistent with the broad claims in media reports lauding the all-around success of NYT's paywall (Doctor, 2013). In fact, our findings are more consistent with industry reports that have lamented the losses in ad revenues accrued to newspaper firms after they erected digital paywalls (Ingram, 2015; Tadena, 2015).

So what is the total impact of the NYT's paywall on its overall revenues? In order to answer this question, we employ industry data as well as our model estimates to perform back of the envelope calculations to infer the revenue impact of the paywall. We first consider online subscriptions, which is a new source of revenue to newspapers on account of the paywall. At the end of our analysis period in 2013, 500,000 readers had signed up for NYT's paid membership. While the NYT offered various pricing tiers for different subscription plans (\$3.75 per week for access

[1] We are thankful to an anonymous reviewer for guiding us to pursue this line of enquiry.

[2] We thank an anonymous reviewer for pointing out the role of declining circulation/advertising in driving the circulation spiral.

to NYTimes.com, $5 per week for online+iPad access, $8.75 per week for unlimited access on all devices),[3] we do not have information on how many consumers signed up for each of these plans. Thus, we use the price of the cheapest plan ($3.75 per week) to arrive at the most conservative estimate for NYT's online subscription revenues. Using this metric, we compute that the NYT gained approximately $97.5 million in online subscription revenues in 2013. We next discuss the impact on online advertising. Given that the NYT lost approximately 48.90% in online revenues (compared to the category level baseline of online newspaper advertising), we can attribute a $7.34 million revenue loss (48.90% of the $15.02 million in online ad revenues) to the paywall.

Next, we consider the spillover effect of the paywall on the print newspaper. Recall that we discussed two plausible mechanisms behind the spillover effect: substitution effect wherein readers abandon the online version and switch to print as a result of the paywall, and the bundling effect wherein readers who would have otherwise subscribed to the online paywall instead find print subscription with free online access more attractive. Given our finding that bundling was probably the main driver of the spillover effect, we base our calculations by considering only bundling.[4]

In order to quantify the magnitude of the spillover effect, we consider two plausible scenarios. First is the most likely scenario based on the modal options chosen by NYT readers. In this case, we assume that the typical marginal reader subscribes to the modal weekend print option at a cost of $6.5 per week. Further, we assume that, in the absence of bundling online access with print, she would have chosen the modal/most affordable digital subscription option at $3.75 per week. Thus, the marginal revenue benefit of the paywall would be $2.75 (i.e., $6.5-$3.75) per subscriber per week. This, leads to a net incremental subscription revenue of $31.3 million. In addition, if we consider the incremental advertising revenue of $126 that each print reader of NYT generates (compiled based on the NYT's 2013 annual report), this would yield an additional $27.6 million in benefits to NYT. The total spillover effect accruing from incremental print subscriptions and advertising would thus be $58.9 million.

Second, we consider a more conservative scenario wherein the reader chooses between: i) the cheapest print option (Sunday only, costing $5 per week), and ii) the mid-priced digital option (which offered digital access on a browser+iPad for a fee of $5 per week). Given that the two prices are identical, there would be no marginal benefit from subscription revenues. Therefore, spillover effect of the paywall in this case would likely arise only from print advertising, i.e., $27.6 million. To put these results in context, for every $1 generated in online subscription revenue as a result of the paywall, the NYT lost $0.08 in online advertising revenue as a result of the indirect effect. At the same time, it gained between $0.28-$0.60 as a result of the positive effect of the paywall on the print newspaper.

There are two potential caveats to the quantification of the spillover effect. First, if advertisers are actively switching between print and online versions of the newspaper, it is possible that some of the calculated increase in print advertising might be a result of advertiser substitution away from online advertising at NYT. However, as Sridhar and Sriram (2015), Salmon (2009) and Hartung (2010) note, such cross-channel substitution is likely to be small. Second, the calculation of the incremental advertising revenues assumes that any increase in readership is immediately monetizable in the form of higher advertising revenues. In reality, it might take some time before this increase in ad revenues as a result of the change in readership can be realized.

The net benefit from the paywall under the conservative (modal) scenario is the sum of the three revenue components: direct effect via online subscription, indirect effect on online advertising and spillover effect on print readership, and consequently, advertising. Based on our calculations, this amounts to a gain of $117.7-$149.1 million, which represents between a 6.4%-8.1% of NYT's total revenues in 2013. Thus, this research is one of the first to offer empirical evidence for a positive economic return from newspaper paywalls, by documenting that the NYT paywall was responsible for at least a 6% gain in its total revenues within a period of two years since its inception.

[3] http://www.nytimes.com/subscriptions/Multiproduct/lp5558.html – retrieved May 2013.

[4] If the spillover effect of the paywall were to be driven by the substitution explanation, all the increase in print readership would be deemed as incremental. This would likely imply a larger revenue gain. Therefore, we can view our analysis as a conservative assessment of the magnitude of the spillover effect.

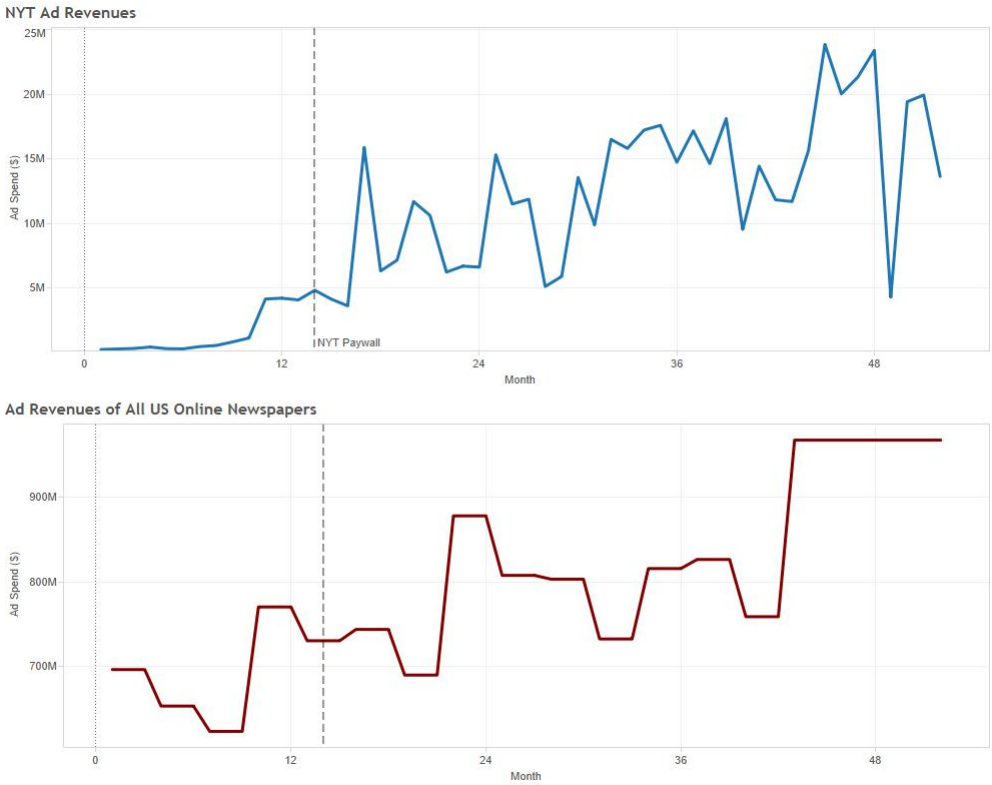

Figure 1: Temporal Evolution of NYT's Online Ad Revenues when compared with the Online Newspaper Industry's.

DV =	log of Ad Revenues						log of Ad Impressions					
	(1)		(2)		(3)		(4)		(5)		(6)	
Parameter	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Paywall	-0.67**	0.25	-0.59*	0.29	-1.45*	0.73	-0.96**	0.26	-0.90**	0.30	-1.52**	0.61
Month Trend	0.25**	0.02	0.25**	0.02	0.26**	0.02	0.26**	0.02	0.26**	0.02	0.26**	0.02
Month Trend - Quadratic	-3.1e-3**	3.0e-4	-3.1e-3**	3.3e-4	-3.2e-3**	3.4e-4	-3e-3**	3e-4	-3e-3**	3e-4	-3e-3**	4e-4
Month of the year fix ef.			✓						✓			
Separate month of the year fix. ef for pre/post					✓						✓	
Adj.R^2	0.89		0.90		0.92		0.88		0.89		0.91	

** p<0.01, *p<0.05, + p<0.1 ; Robust SE's are reported.

Table 12: Online Advertising Regression

DV=	Log of Ad Revenues			
	(1)		(2)	
	1 Qtr pre/post		2 Qtrs pre/post	
	Est.	SE	Est.	SE
Post	-1.079**	-0.244	-1.150**	-0.318
Linear and quad. trends	√		√	
N	6		12	
Adj. R^2	0.902		0.672	

+ p<0.1 * p<0.05 ** p<0.01

Table 13: Short term effect of the paywall on Online Advertising

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