Advertisers Capture: Evidence from Hong Kong

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Abstract

This paper shows that non-coercive pressure on the media can be substantial. Using daily advertising data between 2010 and 2014 in Hong Kong, this paper shows that private advertisers exhibited aversion to a major pro-Democracy (as opposed to pro-Beijing) newspaper. To establish causality, I exploit 1). differences in firms' characteristics that reflect their dependence to the mainland Chinese market and 2). exogenous outbreak of political events and their intensity to examine the effect of political salience on firms' decisions to place ads on a pro-Democracy newspaper. I estimate that the pro-Democracy newspaper suffered from an ad revenue loss equivalent to 33.9% of its total advertising revenue in 2014 due to these mechanisms.

1 Introduction

Media is the fourth pillar of democracy but it exists and functions outside of the formal government institutions. So while freedom of press is a constitutional right in most countries that are considered as democratic, the media environment can still be hostile towards liberal journalists. According to the 2016 annual Freedom of Press report, many countries with democratic institutions such as Malaysia and South Korea were rated "not free" or "partly free".¹ This prompts the question of how and to what extent political pressure outside of legislative boundary and formal institutions could influence media reporting. This paper attempts to shed light on this question by showing that censorship often works through incentives rather than coercion.

By studying the print newspaper advertising market in Hong Kong between 2010 and 2014, I show that private firms exhibited aversion to a pro-Democracy newspaper (Apple Daily) as opposed to a pro-Beijing newspaper (Oriental Daily). I quantify the size of revenue impact on the newspaper by exploring two mechanisms, illustrated in a simple model, that explain advertisers' decision on which newspaper to run their ad on. The first is identified by cross-sectional variation in firms' characteristics. I show that local firms that are politically connected

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¹The methodology comprises of questions that could be divided into three broad categories: the legal environment, the political environment, and the economic environment. 'Not free' countries include Malaysia and Mexico among many others, whereas 'partly free' countries include countries like India, Japan and South Korea.



Figure 1: 2016 Press Freedom Index issued by the Freedom House

with the mainland Chinese government, and firms with headquarters located in mainland were more likely to avoid the pro-Democracy newspaper, compared to otherwise similar firms. The second is identified by time series variation in intensity of polarized reporting. I show that more polarized reporting in turbulent periods led to more aversion to the pro-Democracy media among firms.

This study focuses on the two paid-for newspapers with the largest readership in Hong Kong: Apple Daily and Oriental Daily. The combined readership of the two newspapers represented approximately 75% of the total readership (including online readership²). Apple Daily is widely recognized as pro-Democracy whereas Oriental Daily is considered as pro-Beijing. The owner of Apple Daily, Jimmy Lai, is also widely viewed as an anti-Communist media tycoon and is frequently attacked by pro-Beijing media and politicians. He stepped down as the company's Chairman in December 2014, days after he was arrested in the Umbrella Movement, the largest political unrest that happened in Hong Kong before 2019. In contrary, Ma Ching Kwan, owner of the Oriental Daily, was appointed to be the member of the 10th and 11th session of the Chinese People's Political Consultative Conference (PCC), an important political organization of the mainland government.

In exchange for access to a market with 14 billion people, the Chinese government expects firms to comply with the mainland policies, especially on issues related to sovereignty and national security. Firms that are heavily exposed to or depend on the mainland market, as are the mainland and the politically-connected companies, are expected to display more political sensitivities. Political connection signals closeness to the mainland government and individuals who can exert large influences in the mainland economy are usually invited. For example, owners of major real estate developers and conglomerates such as the Sun Hung Kai Properties (the Kowk family) and the Cheung Kong Holdings (the Li family) are all politically connected,

²Estimated using 2014 readers survey from AC Nielsen.

and their companies have heavy investment in the mainland (Kan, 2016³).⁴ In absence of comprehensive data on firms' economic activities in mainland, I tested the hypothesis that politically connected and mainland firms were more likely to avoid advertising on the pro-Democracy newspaper. It is not a foregone conclusion that political-connected or mainland firms would immediately reject the pro-Democracy newspaper. A possible counter-mechanism is that connected and mainland firms are shelled from political pressure, which makes them more likely to advertise on Apple Daily. The finding disputes this channel, and that connected and mainland firms were more likely to act avoid the pro-Democracy newspaper.

To explore how firms' relationship to the mainland affects their newspaper choice, the basic empirical strategy employed here is to compare the newspaper choice of politically-connected and mainland firms with that of otherwise similar firms. The granularity of data allows me to include ad-level industry fixed effect to control for market-based preference for a particular newspaper. The key assumption is that holding observable firms characteristics constant, connected or mainland companies do not target readers of the pro-Beijing newspaper more.

The biggest threat to identification is that readers of the pro-democracy newspaper could be significantly different from that of the pro-Beijing newspaper, rendering firms' choice of newspaper purely market-based rather than politics-driven. To address this concern, I show that readers' demographic summary is very similar between the two newspapers. Furthermore, there is a significant fraction of readers who read both newspapers. If firms were not trying to sell to readers with a pro-Beijing stance only, it would be difficult to micro-target a specific demographic group by only advertising on the pro-Beijing newspaper. However, one could challenge that targeting readers with a pro-Beijing stance could allow firms to enhance the quality of the match between readers and ads. Namely, the readers' pro-Beijing stance might give additional information to advertisers about their likelihood of purchasing the product that is unobservable to the researcher. I acknowledge this possibility and allow that in our model. However, I note that this interpretation does not square with our finding that foreign companies, which are otherwise similar to connected and mainland companies, were much more likely to advertise on the pro-Democracy newspaper. I contend that if readers' pro-Beijing stance could enhance the quality of the product-reader match, all companies would have taken advantage of that.

One might suggest that even in absence of observable differences in readership demographics, firms' decision might still be justified economically without invoking the argument that firms' decisions were motivated by politics. And that is, pro-democracy readers might be biased against connected firms, and as a result connected firms could rationally respond to readers'

³This paper collected statistics on the land bank of Hong Kong real estate developers in mainland.

⁴From an interview in 2007, Jimmy Lai claimed that Apple Daily is the target of boycott and highlighted the role of the real estate developers in the boycott,⁵

There's a very well organized boycott here. We have almost no real estate advertisement because real estate companies are mostly big companies with business in China. We have 30-35% less ads than we should have. And now the boycott has become very permanent and very organized.

bias by targeting their ads to the pro-Beijing readers who might be more receptive to their ads. I offer two counter-arguments. First, firm's political connectivity is not a salient attribute among readers. Readers need to be motivated enough to look up the board members of the firms and determine whether any of them serve in the mainland government. Second, many of the connected firms are major players in their respective industries and in some cases, there are few to no non-politically connected business alternatives, which makes boycotting connected firms impractical.

The identification strategy of the time series analysis relies on a behavioral insight that consumers' attention tends to be drawn to an attribute which stands out among products (Schkade and Kahneman 1998; Koszegi and Szedil, 2013; Bordalo et al, 2013, 2015). The product is advertising outlet, the attribute is newspaper slant and the consumers are the advertisers in our context. I exploit unexpected outbreak of political events and their intensity to obtain exogenous variation in newspaper slant. The main intuition is that news reports always demonstrate a stronger interpretative narrative that is consistent with the newspapers' underlying political ideology when covering political events. In other words, ideological slant gap implied in the news articles appearing on newspapers representing opposite political stance should diverge when covering political events, but relatively indistinguishable on non-political news such as weather report.⁶ While the ideology of newspapers is ingrained in the public and Beijing's mind, I argue that this divergence created greater political sensitivities and more aversion to the pro-Democracy newspaper, especially among the advertisers that are otherwise less concerned about newspapers' political leaning.

One might suggest an alternative explanation for the empirical pattern, which is that under the assumption of improved newspaper-reader ideology match in polarizing times, firms might gain by advertising to readers with a certain political stance only. I addressed this concern by showing that the interactions between industries fixed effects and slant gap do not vary significantly by industry. If firms were driven by improved advertiser-reader match, I would expect industries that target young customers, who are more likely to have a pro-Democracy leaning, to shift to the pro-Democracy newspaper, and industries that target older customers to shift to the pro-Beijing newspaper in turbulent times. This is not the case, and thus bolsters the interpretation that advertisers were motivated by political concerns.

A remark on the assumption of exogenous newspapers' reporting follows. It is reasonable to suspect that the slant of news report is endogenous to expected advertising demand, which is the mechanism explored by Reuter and Zitzewitz (2006). Specifically, a pro-Democracy newspaper might engage in self-censorship and use milder language, while the pro-Beijing paper would use more provocative pro-Beijing language in turbulent times. Thus, in absence

⁶Eisensee and Strömberg (2007) and Metzger et al (2016) adopted a similar identification strategy. Eisensee and Strömberg (2007) show that the U.S. relief depends on whether the disaster occurs at the same time as other newsworthy events, such as the Olympic Games, which are unrelated to need for relief. Metzger et al (2016) use moments of heightened political tension between Russia and Ukraine to assess whether increase in political salience led to increased identification as either "Russian" or "Ukrainian" among Ukrainian citizens.

of advertising pressure, the slant gap might be greater than the observed level. However, the mechanisms explored in the paper depends on the effect of observed slant gap on advertisers' decision, not the "would-be" slant gap. The estimate therefore should be interpreted as the impact on advertising due to newspapers' chosen level of slant.

I also examined whether connected or mainland firms exhibited extra aversion during the turbulent times. The result was mixed. While there is some evidence that mainland firms were even more responsive to polarized reporting, the effect was insignificant for connected firms. On the other hand, foreign firms were significantly more likely to advertise on Apple Daily in turbulent periods. Among ads that appeared on Apple Daily, I also found that ads from mainland firms were more likely to appear away from the front pages, and foreign firms the opposite. Furthermore, there is evidence that in turbulent periods, connected firms were more likely to have their ads located away from the front pages, and foreign firms the opposite again. The result on this intensive margin is consistent with the overall thesis.

Hong Kong presents several attractive features for the purpose of this study. First, freedom of press is protected by the Basic Law, the de facto constitution. This means that political opinions different from that of the government are tolerated, and government cannot directly interfere with newspaper reporting. Second, the political divide in Hong Kong can be projected onto a political spectrum, with the pro-Democracy camp on one end and the pro-Beijing camp on the other end. This allows me to follow the methodology of Gentzkow-Shaprio (2010) to quantify polarization by using the text from two newspapers sitting at the opposite sides of the political spectrum.⁷ Third, several important political events - including the Umbrella Movement - erupted in our sample period. This provides sources of variation in intensity of political events, as well as variation in newspaper slant gap. Forth, Apple's politically-engaged pro-Democracy owner-billionaire allows the newspaper to withstand financial pressure to continue their provocative pro-Democracy reporting even when tension was high during turbulent periods. Absent of that would render identification of time variation in slant gap impossible.

Our thesis is most comparable to Di Tella and Franceschelli (2011) and Szeidl and Szucs (2017), which empirically illustrate government's intent to capture the media through ad allocation.⁸ While their focus is primarily on advertisements by the government and its subsidiaries, I examine advertising patterns of private firms. This is an important distinction. If private firms act independently in accord to government's preference without central coordination,

⁷Alternatively, Qin et al (2014) used principal component analysis to quantify media bias. They consider 9 content categories: mention of political leaders, citation of Xinhua, controversial issues intensively covered by oppositional overseas Chinese media, corruption, disasters, accidents, sports, crimes, and entertainment. They collapse these 9 dimensions of content differentiation into a single dimension. Groseclose and Milyo (2005) count the times that a particular media outlet cites various think tanks and policy groups, and then compare this with the times that members of Congress cite the same groups. Beattie(2017) uses a text-based method, which also draws inspiration from Gentzkow-Shaprio (2010) to construct an index that captures tone variation of environmentalist and skeptics of climate change.

⁸McMillan and Zoido (2004) provided the most direct evidence of media capture by the government. They show the monetary transfer from the Peruvian government to the media companies during Fujimoto's presidency

it suggests that government's influence extends beyond its own institutions. The mechanism emphasized in this paper is also different: rather than interpreting connected and mainland firms' aversion to Apple Daily as response to explicit demand issued by the mainland government, I interpret that as firms' internalization of the mainland government's preference. Other paper such as DellaVigna et al (2015) has also studied political considerations of private advertisers, but the mechanism studied in this paper concerns directly with the effect of news content, rather than media ownership, on advertisers' decisions. News content is arguably a more direct channel of influence because news content is intrinsically linked to the information readers receive and can affect meaningful economic outcome such as voting (DellaVigna and Kaplan 2007).⁹ This paper is also different in its focus on the effect of newspaper content on advertising decision, rather than the vice versa, which is the emphasis of a large strand of literature that aims to establish causal effect of advertising spending on media content (For example, Reuter and Zitzewitz 2005, Gurun and Butler 2012, Beattie et al 2017, Beattie 2017 etc ¹⁰). The validity of our design hinges on the newspaper ownership's strong anti-government stance, which is not always available in other context.

The identification strategy of this paper is also closely related to DellaVigna et al (2015), Szeidl and Szucs (2017) which exploits changes in political environment to study the effect of political considerations on advertisers' decision. This work also contributes to the literature on the relevance of firms' political connections (Faccio, 2006; Khwaja and Mian, 2005; Knight, 2007; Cingano and Pinotti, 2013; Coulomb and Sangnier, 2014; Luechinger and Moser, 2012). Much of the emphasis of literature is on the financial benefit of political connections. This paper departs from this and shows that politically connected firms could inherit government's preference and act as an extension of the state. The suggested mechanism is also broadly related to the literature of salience in consumers' choice (Schkade and Kahneman 1998; Koszegi and Szedil, 2013; Bordalo et al, 2013, 2015). A number of empirical studies have documented that consumers' attention is drawn to the attribute that stands out from that of the rest of the choices.¹¹ This paper provides new empirical evidence in a novel context. Finally, the finding of this paper suggests that to the extent that private firms can be captured by government via economic incentives, the view that a large private advertising market can promote media independence warrants caution (Petrova, 2011; Gehlbach and Sonin, 2011).

2 Institutional Context

The Sino-British Joint Declaration ensures that freedom of speech and press, among other rights hitherto enjoyed by the people of Hong Kong, will be ensured by law for at least 50 years after

⁹Work on the effects of news contents on readers includes Stromberg (2004); Gentzkow and Shapiro, 2004; Gentzkow, 2006; DellaVigna and Kaplan, 2007; Gerber, Karlan, and Bergan, 2009; Knight and Chiang, 2011; Enikolopov et al, 2011; Snyder and Stromberg, 2010

¹⁰The tendency of consumer and advertisers' desire for the same information posts an empirical challenge to identify causal effect of advertising spending on editorial content is due to. Some of these papers including Reuter and Zitzewitz 2005 and Beattie et al 2017 focus on more specific context where the two effect work in opposite direction.

¹¹See DellaVigna(2009) for a detailed review.

the transfer of sovereignty in 1997. Despite the agreement, there were signs that suggested press freedom in Hong Kong eroded after 1997. The most telling example was the physical assault on an editor of a liberal newspaper by an unknown attacker in 2014¹², which caused a chilling effect among liberal journalists. While local journalists saw the attack as effort of the mainland government to rein in Hong Kong's vibrant media, the pro-Beijing camp dismissed any link between the assault and press freedom. Another sign was the repeated attempts to downgrade politically-sensitive material in news air time by the exclusive free TV channel (TVB), which critics claimed were act of self-censorship.¹³ The annual report by Reporters Without Borders also pointed to these incidents and drastically lowered Hong Kong's press freedom ranking in recent years¹⁴, from 18 in 2002 to 70 in 2015.

Researchers have noted that in parallel to a growing shadow on the media, politics had become gradually polarized over the same period (Cheng, 2014). One manifestation was the increased occurrence of filibusters in the Legislative Council and large-scale protests compared to the early post-colonial period. Several important examples of large-scale protests in this time period follow. In the second half of 2012, a major political controversy involving the governmentbacked Moral and National Education (MNE) led many to the street. Student leaders and other opponents believed that the goal of MNE was to brainwash students into viewing the Chinese Communist regime favorably. They launched a protest with more than 100,000 protesters, which led to occupation of government headquarter that lasted for a few days, and resulting in government's temporary withdrawal of the program. In the last quarter of 2013, HKTV, a content provider started by self-made billionaire Ricky Wong with no political connection, was denied a operation license while other two politically connected companies were granted one. The decision spurred suspicion that HKTV was denied for political reasons, which sparked public outcry and led to tens of thousands protested on the street. In the last quarter of 2014, Umbrella Movement erupted. It was until then the biggest political unrest in decades and drew tens of thousands of protesters to the street. Many of them were young people who were united by a quest for universal suffrage.

2.1 Business and Politics

The business sector has been an ally of the mainland government in fending off demands for progressive democratization from pro-Democracy politicians since before the transfer of sovereignty (Fong, 2014). The close relationship between business and government could be inferred from the post-colonial government institution design. The chief executive of Hong Kong is elected by an election committee, of which the composition is weighted in favor of the business committee (Ma, 2007). In addition, half of the seats in the Legislative Council "Functional Constituency"- seats allocated to professional interest group with very narrow electoral base - are allocated to business groups. Business and professionals also made up a

¹²Kevin Lau, the editor of Ming Pao, was stabbed and suffered from serious injuries

¹³For example, coverage of the 20th anniversary of the 4 June Incident was downgraded.

¹⁴The index ranks the performance of 180 countries according to a range of criteria that include media pluralism and independence, respect for the safety and freedom of journalists, and the legislative, institutional and infrastructural environment in which the media operate.

large percentage of the major advisory committees, as well as the Executive Council in the government (Cheung and Wong, 2004; Ma, 2007).¹⁵ Many business and professional elites in these advisory committees also held seats in the organizations of United Front, which is a mainland initiative to bring different individuals and groups together to rally support for the Chinese Communist Party.

2.2 Participation in Mainland Politics

Very few selected Hong Kong residents can participate in mainland politics. The two main government bodies that allow limited involvement are the National People Congress (NPC, 全國人民代表大會) and the Chinese People's Political Consultative Conference (PCC, 中國人民政治協商會議). The NPC is the official legislative body of the PRC government. It consists of roughly 3000 delegates, and each delegate serves a 5-year term.¹⁶ There are 36 delegates from Hong Kong, and they are elected by a pre-selected group of members. The PCC is a political advisory body. Unlike the NPC, the PCC does not have actual legislative power. Nevertheless, it is an important political organization with the stated goal to "bring together people and groups from different sectors in the society to a common struggle against anti-communism threat". In essence, it aims to unite individuals with different backgrounds to secure the continuing ruling of the Chinese Communist Party. To that end, Hong Kong delegates of the PCC have varied professional backgrounds including high school principal, lawyers, architects, business owners...etc. To become a PCC member, one needs to be "invited" or "recommended" by "related political groups". Neither the selection process of NPC and PCC is open nor transparent to the public.

2.3 Newspaper Market

The print news market in Hong Kong is vibrant. Despite the high internet penetration rate and the growing popularity of internet news sites, traditional paid-for newspapers remained a major source of information for locals in the sample period. There were 7 major paid-for newspapers in a city of 7 million population in the sample period. Aside from Apple Daily and Oriental Daily, Economic Times, Economic Journal, Ming Pao, Sing Tao and the Sun all have a non-trivial fraction of overall readership but their market share was significantly less than that of the two major newspapers.¹⁷ Despite the popularity of the two newspapers, neither paper is known for its credibility as an information source: Apple was ranked 15 out of the 17 newspapers in 2010 in a credibility survey while Oriental was ranked 9¹⁸

Turning to the readers, unlike the US, periodic subscription is not a common form of purchase. Most readers purchase a copy from street vendor. This means that daily readership fluctuates and the exact demographic composition is difficult to estimate in advance for both the advertisers

¹⁵A review by the Legislative Council in 1997 identified more than 300 advisory committees, including statutory advisory boards and committees (65), non- statutory boards and committees (116), non-advisory statutory bodies (73), statutory charitable bodies (4), and statutory bodies dealing with appeals (45)

¹⁶The number of delegates varies slightly in each session.

¹⁷the Sun has ceased publication in April, 2016.

¹⁸http://www.com.cuhk.edu.hk/ccpos/en/research/Credibility_Survey%20Results_2010_ENG.pdf

and the newspapers. Furthermore, many readers are exposed to more than 1 newspaper. Table 1 shows that about 19% of Apple's readers also read Oriental. These features of readers' habit suggest that it is difficult for advertisers to forecast readership on a specific day with high confidence.

	Apple	Economic Journal	Economic Times	Ming	Oriental	Sing Tao	Sun
Apple	1684	54	65	168	316	103	119
Economic Journal	54	93	37	47	19	13	12
Economic Times	65	37	142	32	55	37	28
Ming	168	47	32	356	76	83	83
Oriental	316	19	55	76	1158	48	60
Sing Tao	103	13	37	48	83	157	36
Sun	119	12	28	36	83	60	224

Note: 2014 Data from AC Nielsen Media Index Report.

Table 1: Readership ('000) in 2014 (Including online readership)

Most paid-for newspapers were sold at a cover price of \$7HKD (less than \$1USD) in 2014. The price was raised from \$6HKD to \$7HKD in 2013 by Apple, Oriental and the Sun on the same day, and the decision was soon followed by other newspapers. This suggests the possibility of price collusion and that price was not the distinguishing factor that newspapers use to compete for readers. According to Sing Tao Daily's online advertising rate card, the newspaper requires at least one week notice in order to cancel a previously-placed advertisement.¹⁹ This means that an advertiser cannot easily cancel an ad reservation in response to the news report published on the day before the date the advertisement is scheduled to appear. However, an advertiser can respond to today's news report by deciding where to put an ad tomorrow, and the ad might not appear on the newspaper until further into the future. To reflect this dynamics, I chose the slant time unit measurement to be wide enough such that firms' ad placing response can be captured. A key determinant of advertisers' newspaper choice is ad price. In Hong Kong, ad prices are usually set in the beginning of the year and are committed by the newspapers throughout the year.

3 Illustrative Model

This section considers a highly stylized supply and demand model of newspaper advertising to illustrate the equilibrium effects on ad prices and ad share due to firms' characteristics and their salience to newspaper's political stance. The model abstracts away some relevant aspects of this market to highlight the mechanisms that guide the empirical work. In the model economy, the demand side depicts firms' choice between two newspapers: Apple (A) and Oriental (O). Firms' choice is affected by their salience to newspapers' political stance and their relation to the PRC government. The supply side assumes Bertrand-Nash competition between the two newspapers and ad price is the only decision variable.

¹⁹http://std.stheadline.com/daily/upload/singtao.pdf

The economy is populated by a large number of firms normalized to 1. Firms, indexed by i, can be classified as either Beijing-friendly (B) or neutral (N). Let r denote the fraction of firms that are Beijing-friendly²⁰, which includes politically connected firms and mainland firms in the empirical section. Each firm runs one ad on the chosen newspaper. I assume that advertising is always more beneficial than not advertising, regardless on which newspaper of the ad appears. Firm i receives a random economic benefit e_{ij} for reaching the readers of newspaper j. Economic benefit differs across firms because the quality of the match between firms' target audience and newspapers readers can vary across firms, and is unknown to the researcher.

Firms pay the fixed ad price p_j for running an ad on newspaper j.²¹ This price, as described below, is endogenously determined by market conditions and is committed by the newspapers in the beginning of the period. Beijing-friendly firms avoid Apple Daily so I consider a cost ν on Beijing-friendly firms when they advertise on Apple. This cost could be interpreted as a costly signal needed to demonstrate loyalty to Beijing (Spence, 1973), and is necessary to ensure future economic benefit such as access to profit-enhancing information and asset.

Della Vigna et al. (2015) showed that advertising on Berlusconi's TV station increased when Berlusconi came to power, and their interpretation was that firms received a political benefit to advertise on Berlusconi's TV station. By similar logic, Beijing-friendly firms could potentially enjoy a political benefit by advertising on Oriental Daily and the interpretation of ν would be quite different. However, there are two reasons I prefer the "political cost" interpretation in this setting. First, the context in Della Vigna et al (2015) has a single beneficiary: Berlusconi's TV station. In our setting, there are several newspapers that adopt a pro-Beijing stance while Apple is the only newspaper with a strong pro-Democracy stance. Second, none of the pro-Beijing newspapers is owned by government officials in Beijing, and advertising on them does not buy political favors directly.

As discussed in section 2, firms in Hong Kong are generally wary of being seen as pro-Democracy. I model firms' aversion to Apple as firms' own preference rather than mainland government's explicit involvement, so mainland government's role is implicit in the model. This is also our preferred interpretation of the empirical results: the conservatism in newspaper choice is interpreted more as a gesture rather than a forced action. Specifically, I assume that all firms derive disutility from advertising on Apple Daily, and the level of disutility depends on the firms' political salience and newspapers' ideology. Political salience is determined by news report slant, while ideology is news-invariant. In this setup, firms have a preference for Oriental Daily even in periods with no political event because Apple Daily's pro-Democracy ideology is already ingrained in the public and Beijing's mind.

Denote the news report slant of newspaper *j* as θ_j . The larger the θ the more pro-Democracy

²⁰The fraction of connected firms is treated as exogenous in the model. In reality, government needs to decide whether the company is "worthwhile" in connecting. From the government's perspective, there is a potential trade-off in providing economic benefit for the firm and gaining loyalty from them.

 $^{^{21}\}mathrm{I}$ assume that prices are the same for all firms and that there is no quantity discount.

the news report slants towards. As previously noted, editorial independence might be unlikely in this context and that in absence of advertising pressure, the level of slant might be different. However, given that 1. the mechanism that I explore in the empirical section depends on the observed slant only, and 2. allowing endogeniety of slant does not land itself a empirically testable prediction, I assume that the report slant is independent in this setting. I represent the underlying ideology of Apple and Oriental by $\overline{\theta_A}$ and $\overline{\theta_O}$, and $\overline{\theta_A} > \overline{\theta_O}$. Given all of these, the neutral and Beijing-friendly firms' indifference condition between the two newspapers can be described as follows:

$$e_{iA} - p_A - \theta_A - \overline{\theta_A} = e_{iO} - p_O - \theta_O - \overline{\theta_O}$$
(1)

$$e_{iA} - p_A - \nu - \theta_A - \overline{\theta_A} = e_{iO} - p_O - \overline{\theta_O} - \overline{\theta_O}$$
(2)

The first equality implies that even when the news report slant is the same between two newspaper, Oriental is still more attractive to advertisers than Apple because of its ideology. The second equality implies that it takes a larger economic benefit from advertising on Apple for Beijing-friendly firms to advertise on Apple relative to the neutral firms. Note that demand for Oriental Daily will also suffer if their reporting becomes more pro-Democracy holding Apple's slant constant. The equalities also imply that the larger the slant gap ($\Delta \theta \equiv \theta_A - \theta_O$), the less attractive is Apple Daily to firms holding other parameters constant. This suggests that while political salience increases with news report's slant, increase in salience alone does not affect firms' newspapers choice if both newspapers slant towards the same direction. Increasing contrast in news report slant, however, sway firms away from Apple. That consumer salience increases with contrasts in options has been highlighted in the literature (Bordalo et al, 2013, 2015; Koszegi and Szedil, 2013).

Denote the difference in economic benefit between two newspapers for advertiser *i* as $\triangle e_i \equiv e_{iA} - e_{iO}$. For tractability, I assume $\triangle e$ follows a uniform distribution with support $[-\delta, \delta]$. Given a threshold $\triangle e^*$ of which firms are indifferent between the two newspapers, firm *i* will place the ad on Apple if $e_{iA} > \triangle e^*$. Below the threshold, the firm will place the ad on Oriental. Hence the probabilities that neutral and Beijing-friendly firms will advertise on Oriental are:

$$S_{NO} \equiv \frac{p_A - p_O + \Delta\theta + \Delta\theta + \delta}{2\delta} \tag{3}$$

$$S_{BO} \equiv \frac{p_A - p_O + \nu + \Delta\theta + \Delta\overline{\theta} + \delta}{2\delta}$$
(4)

The probabilities that neutral and Beijing-friendly firms' will advertise on Apple are $S_{NA} \equiv (1 - S_{NO})$ and $S_{BA} \equiv (1 - S_{BO})$) respectively.

On the supply side, our view is that advertising space on newspaper is flexible and can be easily adjusted to accomodate fluctuation in ad volume; there is no capacity constraint such that newspapers can print as many pages as needed,²² and there is no minimum ad quota to fill. I model ad price-setting as a simple Bertrand competition where ad prices are set simultaneously

²²In contrary to TV commercials studied in DellaVigna et al (2015), ad spaces on newspapers are much more flexible since editors can rearrange news stories to fit however many number of pages needed to fit all advertisements.

by the newspapers and newspapers take into account of the best response strategy of each other to maximize expected revenue. I assume that the marginal cost of printing an additional ad equals to 0. Furthermore, newspapers have a correct expectation of the polarization over the period such that price is set correctly to reflect how political climate affects demand. Given these assumptions, Apple and Oriental choose ad price to maximize the following profit functions respectively:

$$\pi_A \equiv p_A \left[r(1 - S_{BO}) + (1 - r)(1 - S_{NO}) \right]$$

$$\pi_O \equiv p_O \left[r(S_{BO}) + (1 - r)(S_{NO}) \right]$$

The first order condition with respect to ad price yields the newspapers' best response pricing function. Substituting the pricing function of one newspaper into another yields the closed-form solution for ad price. The equilibrium share can be obtained by evaluating equations 3 and 4 at the respective equilibrium ad prices.

$$p_{O}^{*} = \delta + \frac{rv + \Delta\theta + \Delta\overline{\theta}}{3}$$
$$p_{A}^{*} = \delta - \frac{rv + \Delta\theta + \Delta\overline{\theta}}{3}$$
$$S_{O}^{*} = \frac{1}{2} + \frac{rv + \Delta\theta + \Delta\overline{\theta}}{6\delta}$$
$$S_{A}^{*} = \frac{1}{2} - \frac{rv + \Delta\theta + \Delta\overline{\theta}}{6\delta}$$

Ad price is sticky in the short run because newspapers have to commit to its price set in the beginning of the time period. Therefore ad share is the only moving variable if I vary other parameters. Holding ad price constant, the model predicts that an increase in occurrences and intensity of political events leads to a fall in Apple's ad share. In the medium run, newspapers can adjust prices and the model predicts that an increase in political events will lead to wider price gap and ad share gap also diverges. In the empirical section, I test the following specific predictions:

- 1 Apple's ad share drops relative to Oriental in politically polarizing periods.
- 2 Ad price gap increases in politically polarizing periods.
- 3 Beijing-friendly firms are less likely to advertise on Apple relative to Oriental in all periods.
- 4 All firms are less likely to advertise on Apple in politically polarizing periods.

Since our data does not contain variation in readership composition over time, our model does not explore reader's potentially endogenous newspaper choice to slant. In richer models, readers can become more salient to the newspapers' political stance in turbulent times. They might be more likely to read the newspapers when big news happened. And if the underlying population purchases more copies of Apple in turbulent times, the economic benefit of advertising on Apple will increase for firms. Our model prediction will then underestimate the cost of political salience.²³

²³This benefit from advertising on Apple to firms is likely to be unevenly distributed across firms. Firms that target a pro-Democracy demographic group, which are more likely to be younger, will benefit whereas firms that target older consumers are less well-off.

4 Data

4.1 Advertising

Our ad dataset contains all newspapers ads between 2010 and 2014. It is made available by a Hong Kong-based private company, Wisers, and their main business is to produce market intelligence for businesses. I excluded tender, announcement, and obituary because they are often ran by individuals rather than companies. All ads that were issued by the newspapers themselves are also discarded. The information for each ad includes the headline, date that the ad appeared on newspaper, the industry(s) that the product(s) belongs to, the company(s) that sells the product(s), and the section of newspaper that the ad appeared. There are 17 possible industries assignment using Wisers's classification.²⁴

I merged the ads dataset with a company information dataset that I constructed by matching the company name.²⁵ In the company information dataset, I classified a company as "Local", "Foreign" or "Mainland" by the company's headquarter location through information published on the companies' website.²⁶ I also classify an organization as "listed on Hong Kong Stock Exchange (HKSE)", "for-profit", "not-for-profit" or "government agencies" based on other publicly available information. Finally, I verified the mother company of the advertiser.²⁷

Ads can have multiple company assignments because multiple companies could be featured on the ad. I count an ad by the combination of the ad headline and the date for which the ad appeared. An ad with the same headline could appear on multiple days, and would be considered as different ads. Since I do not observe ad size, an ad with the same headline appearing on the same date with different size on different newspapers would still be considered the same ad. I count an ad assignment by unique combination of an ad (defined above) and the company associated with the ad. As an example, a cell phone ad could have two ad assignments: one with the network carrier, and one with the phone manufacturer.

In summary, there are 116954 ads, 15666 firms, 13757 mother firms, and 300607 ad assignments. There are 147004 ad assignments on Apple Daily, and 166434 on Oriental Daily in total. On average, there are 1.8 companies, and 1.2 industries assignment per ad. 32604 ads have a HKSE-Listed advertiser assignment. 41248 ads have one or more foreign advertisers, but only 4520 ads have one or more mainland advertisers. 968 ads are related to the local government bureaucracy, and 2569 have one or more not-for-profit organizations. Over the sample period, there are 27312, 25939, 22456, 22568, 18679 ads in each year between 2010-14. Finally, only 4899 unique ads appear on both Apple Daily and Oriental Daily.

²⁴Automobile, Baby products, Banking, Beauty, Computers, Education, Electronic Appliances, Fashion and Accessories, Food & Beverages, Insurance, Pharmaceutical, Real Estate /property, Restaurants, Retail, Sports, Telecommunication, Travel (airline, hotel).

²⁵Since there is variation in company names across the datasets, I perform fuzzy match using the the Python library *difflib* and manually verified the quality of the match.

²⁶Companies from Taiwan are classified as "Foreign" whereas companies from Macau are classified as "Mainland".

²⁷In most cases, Wisers lists the owner of the brand and I cross check to make sure the mother company is correct.

4.2 Politically Connected Advertisers

Following the literature on political connection (Faccio 2006, Khwaja and Milan 2005, Accemoglu et al 2014), I classify a HKSE-listed firm as "connected" to Beijing if at least one of the mother firm's board members appears on the list of connected individuals. I identify the board members through information from the Hong Kong Exchange and Clearing Limited, which maintains a list of all board members of companies on HKSE.²⁸ The list of connected individuals consists of all Hong Kong representatives of the NPC and PCC from the 9th to 12th session. The 9th session was between 1998 and 2003, and each session is 5 year long. There are 73 NPC members, and 264 PCC members in total. Since there are overlapping members between the NPC and PCC, the combined list results in 331 unique individuals after removing duplicates.²⁹

There are several business conglomerates in Hong Kong, and they play an important role in the economy. The presence of these business conglomerates means that despite the relatively few number of connected individuals, these connections can spread through the web of business empire. For example, both New World Mobility (telecommunication) and New World Development (real estate) belong to the New World Group and therefore are classified as politically connected. Similarly, the Cheung Kong Group parents the Hutchison Group (telecommunications and others) and Watsons (A large retail chain) among others. These children companies are all major players in their respective industries.

For advertisers that are not listed on the HKSE, there is no formal way to identify their ownership information. Instead, I gathered the online profiles of the list of connected individuals from the official website of their respective organizations (NPC and PCC), which contain the occupation and outside positions of each member.³⁰ This information is inexhaustive since many individuals have multiple affiliations but the online profiles usually list the primary affiliation only. I then cross-referenced with the ads dataset to identify the businesses or organizations that are associated with the profiles.

In summary, there are 20032 ads that have one or more connected advertiser. Table 2 shows the total number of all and fraction of connected ad assignments by industry. The "Banking" industry has the most ad assignments, followed by the "Travel", "Retail" and "Restaurants" industries. The percentage of connected ad assignments within each industry varies significantly. The "Insurance" industry has 29% of connected ad assignment - the highest among all industries -, followed by "Telecommunications", "Banking" and "Real Estate".

²⁸http://www.hkexnews.hk/reports/dirsearch/dirlist/directorlist_c.htm

²⁹The list excludes representatives of other provinces who are Hong Kong residents. There is no rule that restricts the PCC representatives of a province to be residents of that province. For example, Lawrence Ma(馬恩國) is the representative of Shanxi province in PCC, and Karson Choi (蔡加讚) is the representative of Guangxi province. Both are Hong Kong residents. Most of the representatives of Hong Kong are Hong Kong residents, however.

³⁰I retrieved the profile of all connected individuals using a python script to scrape their profile on the official websites of the NPC and PCC. The websites are :

http://www.npc.gov.cn/npc/gadbzl/xgdbzl_11/node_8514.htm

http://www.cppcc.gov.cn/CMS/icms/project1/cppcc/wylibary/wjWeiYuanList.jsp



Figure 2: Total number of ad assignments and fraction of ads assignments placed by connected organizations by industry.



Figure 3: Ad Assignment by company characteristics

Figure 3 shows the breakdown of ad assignments by other firm characteristics. Foreign companies were responsible for over 80,000 ad assignments as opposed to less than 10,000 ad assignments from mainland companies. Less than 10% of the foreign ad assignments were connected. In contrast, the percentage of connected ad assignment was over 60% among HKSE-listed ad assignments, which accounted for over 60,000 ad assignments in total. This is not surprising because HKSE-listed firms are often larger in size and revenue and are likely to

be heavily exposed to the mainland market.

Figure 4 plots the percentage of connected ad assignments in each quarter by newspaper. In all but one quarter, the percentage of connected to total number of ad assignments was higher on Oriental Daily. There is no visible trend over time. Figure 5 shows a similar plot for mainland ad assignment. The percentage of mainland ad assignments to total ad assignments at each newspaper was higher at Oriental in all quarters. Notably, the gap between the two newspapers diverged in 2014.









4.3 Readership

Fluctuation in Apple Daily's readership could potentially explain its variation in ad share. To investigate this possible pathway, I turn to the estimated readership reported in Apple Daily's annual investor report, which came from surveys conducted by AC Nielsen.³¹ The numbers are presented in columns 3 and 4 in table 2. In 2010, the total readership was quite close between the two newspapers, but Oriental's gradually shrunk to 1.2 millions. In contrary, readership has remained relatively flat for Apple at around 1.5 millions. ³²

	Apple	Oriental	Apple	Oriental	
	Ad Price	е	Readership (Print + Online)		
2010	85.3	104.95	1,566	1,457	
81.3%			107.5%		
2011	109.02	124.88	1,535	1,392	
87.3%			110.3%		
2012	114.48	121.95	1,503	1,344	
	93	8.9%	111.8%		
2013	114.48	150.68	1,411	1,207	
76.0%			116.9%		
2014	120.84	165.92	1,684	1,158	
	72	2.8%		145.4%	

Note: The second row in each year indicates the % of Apple's price and readership relative to Oriental's. Ad price measures the price per cm² of color ads in the run-of-paper. The unit of readership is 1000. Price data from 2013-2014 comes from Wisers. Prices from 2010-2012 come from a private mainland company (http://www.cmtad.com.cn/). Unit of price is Hong Kong dollars per cm². Readership data from Next Media annual financial report.

Table 2: Ad Price and Readership

³¹Oriental reports a different readership estimate from a different market research estimate in their annual investor report. They claim that they have about 4 million readers, while population in Hong Kong is about 7 millions. The very large number seems dubious and I choose to use the estimate of Apple instead. Another reason I use Apple's estimate is that I have access to AC Nielsen's Media Index 2014 report, and have verified their 2014 reported number. Finally, Oriental only reported the estimated readership for their own, but not the other newspapers.

³²A disadvantage of the data is that Apple only reports the combined readership of print and online readers but not separately. I therefore gathered information from 2014 AC Nielsen's media report to understand the newspapers' print and online readers composition. Even so, there are readers who read both the print and online version so it is difficult to provide a true estimate of the print readership only. I noted that in 2014, Apple's readers were much more likely to be also online readers than Oriental readers: the fraction of total readers who were also online readers in Apple and Oriental were 41% and 11% respectively. Hence, it is possible to conclude that the print version of Apple had become less attractive relative to print version of Oriental to advertisers from an economic standpoint only if I assume that Apple's online readership grew much faster than Oriental in the period. However, since I included linear time trend as well as other quarter specific controls in the estimating equation, they should control for readership changes.

	Apple	Oriental	Total
Average Age	43	47	40
Average Household Income (HK\$ per Month)	33878	32835	32115
Fraction of Readers who are:			
Female	46.37	48.4	53.69
Working	71.98	65.44	63.34
Student	3.73	4.74	11.71
Retired	7.76	11.62	7.3
Unemployed	4.03	7.84	6.49
Fraction of Readers who live in:			
Government Housing	35.58	34.08	29.21
Highest Level of Education completed:			
Primary Completed	11.49	16.07	10.52
F4-F5 (Grade 10-11)	24.4	25.17	25.06
University Or Above	22.58	17.23	27.88

Table 3: Readers Demography. Source: AC Nielsen 2014.

AC Nielsen regularly surveys over 6000 individuals of the Hong Kong general population aged between 12 and 64. The samples are weighted to the population of Hong Kong based on government statistics, making the sample representative to the 7 million residents in Hong Kong. The 2014 AC Nielsen's media index summarizes the readers demographics of the two newspapers, as presented in table 3. The average reader of Oriental Daily was slightly older (47 vs 43) while the average household income was very similar between the two newspapers. The fraction of readers who are female, employed is also very similar between the two newspapers. The education level of Apple's reader is however slightly higher: percentage of readers who have completed university or above was roughly 5% higher at Apple. Both newspapers had slightly more than 1/3 of their readers living in government housing.

A limitation of the readership dataset is that the date of the survey was not included and therefore, I cannot estimate if and how readership is affected during politically-polarized periods. However, as previously noted, the day-to-day fluctuation in readership and its composition is also unknown to the advertisers so it would be impossible for them to optimize ad spending on daily basis. And if the hypothesis that readership becomes more dissimilar between the two newspapers in turbulent periods holds, the data suggested that based on observable demographics, the readership demographics were still very similar in the most turbulent year in the sample period (2014), which implied that the demographics would be even more similar in the earlier years.

5 Measuring Slant Gap

I follow the methodology of Gentzkow and Shapiro (2010) to quantify slant gap between Apple Daily and Oriental Daily in each quarter. The main idea is to compare the relative frequencies of the most "ideology-telling" phrases in the two newspapers with that of the relative frequencies in the reference pro-Beijing and pro-Democracy rhetoric. These "ideology-telling" phrases are phrases that are indicative of the political stance of the user. For example, one would expect the

reference pro-Beijing rhetoric to use words such as "stability" more heavily and the reference pro-Democracy rhetoric to use words such as "freedom" and "justice" more often to emphasize on the values that they represent.

The main input of the slant measure is the daily front-page articles that appeared on Apple Daily and Oriental Daily between 2010 and 2014. Access to the newspapers archives is provided by Wisers. Other inputs to the slant measure are the editorial of the Hong Kong version of Wen Wui daily and the newspaper column "Law and Politics" (Chinese: 法政隨筆). They are used as the reference Pro-Beijing and pro-Democracy rhetoric respectively. Wen Wui Daily is a state-owned newspaper. It is controlled by the Liaison Office of the mainland government, and is often regarded as the mouthpiece of the Chinese Communist party. Their editorial is published daily (sometimes multiple editorials are posted in a day) and is publicly available on their website. I wrote a Python script to scrape all editorials from the newspaper's website.

"Law and Politics" is a column written by 7 pro-Democracy politicians/lawyers. The column has been published daily on Ming Pao since 2003. The contributors include Margaret Ng, Audrey Eu, Ronny Tong, Alan Leong, Gladys Li, Johannes Chan, Martin Lee, Albert Ho and Benny Tai.³³ Many of them were lawyers who belonged to the pro-Democracy political party, the Civic Party. Notably, Benny Tai - the initial advocate of "Occupy Central" movement, which later became the Umbrella Movement, has contributed to the column since 2011.³⁴

The computed-assisted processing of Chinese language only differs from that of English slightly. The first step involves removing all numbers, punctuation, and non-Chinese words from the text. Because the Chinese language does not have white space between words like English, I applied a procedure to parse sentences into meaningful phrases (I consider bi-gram, tri-gram and quad-gram as phrases made up of two, three and four Chinese characters respectively.). This is done by implementing an existing package (rwordseg) in R. For this step, I supplemented the package with a list of words that are specific to Hong Kong usage because many local dialogues and newly created phrases do not already exist in the dictionaries that come with the R package. I went through two procedures to create a list of new words. The first procedure was manual. I eyeballed all the phrases decomposed by the computer script and manually check whether some phrases should be joined together. For example, many names of the government officials were not recognized by the script, so I added them to the dictionary. Second, I wrote a script to concatenate unigram into bi-, tri- and quadgram, and rank them by the frequency they appear. I then manuallyed check whether these high-frequency terms represent any meaningful phrases. If so, these high-frequency terms were added to the dictionary.

5.1 Selecting Phrases

The next step is to select the phrases that most likely contain ideological valence. Let f_{plw} and f_{pll} denote the total number of times phrase p of length l used by Wenwui and Law and Politics, respectively. And let f_{-plw} and f_{-pll} denote the total occurrences of length-l appeared in by

³³Some authors dropped out and others joined during the sample period.

³⁴Most articles are writted in Chinese, and I excluded all articles written in English.

Wenwui and Law and Politics that are not phrase p. I compute the Pearson's χ^2 statistic for each phrase:

$$\chi^{2} = \frac{(f_{plw}f_{-pll} - f_{pll}f_{-plw})^{2}}{(f_{pll} + f_{plw})(f_{pll} + f_{-pll})(f_{plw} + f_{-plw})(f_{-pll} + f_{-plw})}$$
(5)

Pearson's χ^2 statistic is a test statistic for the null hypothesis that a phrase is equally likely to appear in Wenwui and Law and Politics. A large Pearson's χ^2 suggests that the phrase is unlikely to be in both, and would therefore imply high ideological valence.

For each period, I rank the phrases by their Pearson's χ^2 and identify the top 80 phrases with the largest χ^2 . The 80 phrases can be of any combinations of bi-gram, tri-gram and quad-grams.³⁵³⁶ Table 4 shows the phrases that are more heavily used by the pro-Beijing rhetoric in each quarter. Table 5 shows a similar table for pro-Democracy phrases. Many phrases in the tables are what our intuition would choose to express the users' ideological leaning. For example, the economy and foreign relations are emphasized more in the Wenwui editorials. In 2011, phrases such as "Development", "Economy", "Financial Crisis", and "United States" are among the most pro-Beijing phrases. In contrary, "Ai Weiwei" (Famous Chinese artist and dissident), "Election", "Democracy" and "Freedom of Press" are among the most pro-Democracy phrases in this period. The emphasis changed over time for both references. In quarter 4 of 2014, Wenwui made its view on the "Occupy Central" movement clear by using phrases such as "Law-Violating Central Occupation". It also used phrases such as the "police" and "Basic Law" to emphasize the need to bring law and order back. In contrary, the pro-Democracy phrases in this period included "Civil disobedience" to justify the morality and legality of the occupation and emphasized the government's wrongdoing.

5.2 Mapping Phrases to Slant

The list of 80 phrases gives us a basis to evaluate the slant of the news report in each period. I next compare the frequencies of these phrases used in the reference rhetoric and the news report. For each quarter, I index the phrases by $p \in \{1...80\}$ (Ignore phrase length, quarter for convenience of notation.). Let f_{pn} denote the frequency of phrase p on newspaper n. I also let $\tilde{f}_{pw} \equiv f_{pw} / \sum_{p=1}^{80} f_{pw}$ denote the relative frequency of phrase p in the Wenwui editorials in each period. \tilde{f}_{pl} , the relative frequency of phrase p, is defined similarly for phrases in the Law and Politics column. I estimate slant in each period separately for the two newspapers as follows:

i For each phrase *p*, calculate the difference in relative frequencies between Law and Politics and Wenwui: $\Delta \tilde{f}_p \equiv \tilde{f}_{pl} - \tilde{f}_{pw}$.

³⁵Gentzkow and Shapiro (2010) use equal number of bi-grams, tri-grams and quad-grams. I deviate from their treatment because this treatment gives us higher predictive power. Specifically, some quad-grams might be more informative than bi-grams in some periods or others. Using only the top 80 chi-square phrases helps us capture that.

³⁶There is nothing in this procedure that guarantees equal number of "ideology-telling" phrases from both sides. In other words, this step does not always yield 40 pro-Beijing and 40 pro-Democracy phrases each time. In the appendix I show the distribution of the number of pro-Beijing and pro-Democracy phrases over the sample period. The figure shows that there is consistently more pro-Democracy phrases than pro-Beijing phrases identified by this procedure. The reason is that the length of the pro-Democracy reference is shorter than that of the pro-Beijing reference, which means that the chi-square of a particular pro-Being phrase will always be lower.

		Bigram	Trigrm	Quadgram
2010	Q1	本港 (Hong Kong)	人民幣(Renminbi)	公社兩黨 (Civic Party & League of Social Democrats)
		經濟 (Economy)	投資者 (Investor)	金融海嘯 (Financial Crisis)
		市場 (Market)	房地産 (Real Estate)	主流民意 (Mainstream Opinion)
	02	本港 (Hong Kong)	反對派 (Opposition Group)	金融海嘯(Finance Crisis)
	~	經濟 (Economy)	人民幣(Renminbi)	公社兩黨 (Civic Party & League of Social Democrats)
		////////////////////////////////////	消費者(Investor)	主流民音 (Mainstream Opinion)
	03	本港 (Hong Kong)	人 民幣(Renminbi)	一型灰鋼場 (Columbarium field)
	20	中國 (China)	約角島 (Diao-Yu Islands)	全融海嘯 (Financial Crisis)
		徑濟 (Economy)	小 法通 (Octopus Card)	停車 作业 (Switch Off Idling Vehicles)
	04	★浩 (Hong Kong)	人 民幣 (Penminhi)	古容盤校 (Directly Subsidized Schools)
	Q4	本语 (Hong Kong)	大氏市 (Kerminor)	直員学校 (Diffectly Subsidized Schools)
		經濟 (Economy)	仅具有 (Investor)	員帶政東 (Monetary Policy)
2011	01	夫國 (United States)	厉地准 (Keal Estate)	通服壓力 (Inflationary Pressure)
2011	QI	中國 (Cnina)	小比显 (Libya) 按在推《Nuclear Crisis)	取版上頁 (Minimum wage)
		經濟 (Economy)	核厄依 (Nuclear Crisis)	迪康壓力 (Inflationary Pressure)
	~	夫國 (United States)	在氏連 (League of Social Democrats)	經濟学家 (Economist)
	Q2	中國 (China)	人氏幣 (Renminbi)	· 通服壓刀 (Inflationary Pressure)
		經濟 (Economy)	塑化劑 (Plasticizer)	中小企業 (Small and Medium-Sized Enterprises)
		本港 (Hong Kong)	研究所(Research Institute)	電力 など (Food Safety)
	Q3	經濟 (Economy)	投貨者 (Investor)	債務危機 (Debt Crisis)
		(China)	人民幣 (Renminbi)	歐信危機 (European Debt Crisis)
		發展 (Development)	研究所 (Research Institute)	豬肉價格 (Price of Pork)
	Q4	經濟 (Economy)	人民幣 (Renminbi)	歐債危機 (European Debt Crisis)
		中國 (China)	反對派 (Opposition Group)	貨幣政策 (Monetary Policy)
		市場 (Market)	準備金 (Reserve Fund)	債務危機 (Debt Crisis)
2012	Q1	中國 (China)	人民幣 (Renminbi)	愛國愛港 (Love the Country Love Hong Kong)
		經濟 (Market)	敘利亞 (Syria)	貨幣政策(Monetary Policy)
		市場 (Market)	競爭力 (Competitive Power)	研究中心 (Research Institute)
	Q2	中國 (China)	菲律賓 (Philippines)	歐債危機 (European Debt Crisis)
		經濟 (Economy)	立法會 (Legislative Council)	經濟學家(Economists)
		美國(United States)	人民幣(Renminbi)	貨幣政策 (Monetary Policy)
	Q3	日本 (Japan)	釣魚島 (Diao-Yu Islands)	中國政府 (Chinese Government)
		中國(China)	國有化 (Nationalization)	經濟學家 (Economist)
		經濟 (Economy)	研究所(Research Institute)	架構重組 (Restructuring)
	Q4	中國 (China)	釣魚島 (Diao-Yu Islands)	改革開放 (Reform and Open)
		經濟 (Economy)	習近平 (Xi Jinpin)	中國海軍 (Chinese Navy)
		日本 (Japan)	十八大 (18th National Congress of the Communist Party of China)	最低工資 (Minimum Wage)
2013	Q1	中國 (China)	釣魚島 (Diao-Yu Islands)	施政報告 (Policy Address)
		日本 (Japan)	習近平 (Xi Jinpin)	火控雷達 (Fire Control Radar)
		經濟(Economy)	人民幣(Renminbi)	中國軍隊 (Chinese Military)
	Q2	中國 (China)	釣魚島 (Diao-Yu Islands)	改善民生 (Improve Livelihood)
		日本 (Japan)	反對派 (Opposition Group)	全國人大 (National People's Congress)
		經濟(Economy)	職工盟 (Hong Kong Confederation of Trade Unions)	泛政治化 (Pan-politicalization)
	Q3	中國 (China)	反對派 (Opposition Group)	愛國愛港 (Love the Nation Love Hong Kong)
	-	經濟 (Economy)	夏千福 (Clifford Hart)	中國海軍 (Chinese Navy)
		日本 (Japan)	堆填區 (Landfill)	海洋權益 (Rights in the Ocean)
	04	中國 (China)	反對派 (Opposition Group)	三中全會 (Third Plenary Session)
	~	日本 (Japan)	基本法 (Basic Law)	特首普選 (Universal Suffrage of Chief Executive)
		本港 (Hong Kong)	釣魚島 (Diao-Yu Islands)	堅定不移(Unflinching)
2014	01	本港 (Hong Kong)	反對派 (Opposition Group)	施政報告 (Policy Address)
	~	經濟 (Economv)	基本法 (Basic Law)	落實普選 (Fulfill Universal Suffrage)
		美國(United States)	邵逸夫 (Run Run Shaw)	軍國主義 (Militarism)
	O2	美國 (United States)	反對派 (Opposition Group)	佔中公投 (Occupy Central Referendum)
	~-	中國 (China)	釣魚島 (Diao-Yu Islands)	新界東北 (Northeast New Territories)
		日本 (Iapan)	財委會 (Finance Committee)	軍國主義(Militarism)
	03	本港 (Hong Kong)	反對派 (Opposition Group)	落實普選 (Fulfill Universal Suffrage)
	20	依法 (Accord to Law)	基本法 (Basic Law)	人大決定 (National People's Converse's Decision)
		議員 (Council Membere)	戴耀廷 (Benny Tai)	主流民音 (Mainstream Oninion)
	04	佔中 (Occupy Central)	反對派 (Opposition Group)	佔領行動 (Occupation)
	~ *	經濟(Economy)	滬港通 (Shanghai-Hong Kong Stock Connect)	佔中搞手 (Occupy Central Schemer)
		警方 (Police)	基本法 (Basic Law)	違法佔中 (Law-Violating Central Occupation)
		= /3 (2 Once)	unit in (Subic Luw)	A series of the

Table 4: Phrases with highest χ^2 and used by Wenwui Daily in each year and quarter

		Bigram	Trigrm	Quadgram
2010	Q1	民主(Democracy)	八十後 (Post-'80)	功能組別(Functional Constituency)
		憲政 Constitutional Forms)	戴耀廷 (Benny Tai)	變相公投 (De facto Referendum)
		人民 (People)	劉曉波(Liu Xiaobo)	零八憲章 (Charter 08)
	Q2	民主(Democracy)	香港人 (Hong Kong people)	功能組別 (Functional Constituency)
	-	投票(Voting)	民主派 (Democratic Group)	變相公投(De facto Referendum)
		選舉(Election)	戴耀廷 (Benny Tai)	民主運動 (Democratic Movement)
	03	民主(Democracy)	戴耀廷(Benny Tai)	司法制度 (Judiciary System)
	×.	特首(Chief Executive)	基本法 (Basic Law)	功能組別(Functional Constituency)
		政治 (Politics)	世三條 (Article 23)	行政長官 (Chief Executive)
	01	民主 (Democracy)	到職法 (Lin Xiaobo)	同民教育 (National Education)
	Q4	法坐 (Bula of Law)	對地波 (Elu Aldobo)	図に取用 (National Education) 社会士差 (Consistions)
		法院 (Counto)	立注金 (Lassislative Consul)	社員主義 (Socialishi)
2011	01	运死 (Counts)	立法音 (Legislative Concur)	自世頂值 (Universal values)
2011	QI	成为 (Government)	立法音 (Legislative Concur)	何画政府 (Judicial Review)
		氏主 (Democracy)	戦離廷 (Benny Iai)	削限日用 (Headstrong)
	~ -	入境 (Border Entry)	音港人 (Hong Kong people)	局度目沿 (High Degree of Autonomy)
	Q2	法院 (Courts)	文木木 (Ai Weiwei)	司法獨立 (Judiciary Independence)
		報名 (Apply to)	立法曾 (Legislative Council)	國民教育 (National Education)
		立法 (Legislative)	戴耀廷 (Benny Tai)	終審法院 (Court of Final Appeal)
	Q3	選舉 (Elections)	香港人 (Hong Kong people)	新聞目由 (Freedom of Press)
		法律 (Law)	候選人 (Candidates)	核心價值 (Core Values)
		名單 (Candidate List)	基本法 (Basic Law)	武俠小説(Martial Arts Fiction)
	Q4	特首 (Chief Executive)	法改會 (Law Reform Commission)	司法覆核 (Judicial Review)
		檔案	梁振英 (CY Leung Chun Ying)	私立大學 (Private Universities)
		法律 (Law)	公民黨 (Civic Party)	六十五億 (6.5 billions)
2012	Q1	特首(Chief Executive)	香港人 (Hong Kong people)	特區政府 (HKSAR government)
		議員 (Council Members)	梁振英 (CY Leung Chun Ying)	特區政府 (HKSAR government)
		監察 (Monitor)	中聯辦(Liaison Office of the PRC in HKSAR)	核心價值 (Core Values)
	02	法律 (Law)	梁振英 (CY Leung Chun Ying)	議事規則 (Rules of Procedure)
	~	法治 (Rule of Law)	中聯辦 (Liaison Office of the PRC in HKSAR)	律政司長 (Secretary of Justice)
		民主 (Democracy)	李旺陽 (Li Wangyang)	終審決院 (Court of Final Appeal)
	03	民主 (Democracy)	信權人 (Creditor)	公民教育 (Civil Education)
	20	教育 (Education)	戴耀廷 (Benny Tai)	自面批評 (Negative Criticism)
		程序 (Sequence)	梁振革 (CY Leung Chun Ying)	(Judiciary Traditions)
	01	特首 (Chief Executive)	深振革 (CY Loung Chun Ying)	司法獨立 (Judiciary Independence)
	Q1	注除 (Courts)	注律界 (Law Circles)	A 家注院 (Court of Final Appeal)
		注定 (Ludges)	香港人 (Hong Kong people)	於甲社會 (Civic Society)
2012	01	法告 (Judges)	新振英 (C)(Laura Chun Vina)	上海中理 (Decentral Occurrent)
2013	QI	伝律 (Law)	采振央 (Cf Leung Chun Ying)	伯視中環 (Peacerul Occupation of Central)
		律即 (Lawyers)	戴雁廷 (Benny Iai)	公氏抗甲 (Civil Disobedience)
	~	行動 (Action)	香港人 (Hong Kong people)	和半佰中(Peaceful Occupation of Central)
	Q2	冏討 (Negotiation)	會港人(Hong Kong people)	和平佔中 (Occupy Central)
		民王 (Democracy)	湯顯明 (limothy long)	紅十子曾 (Red Cross)
		父親 (Father)	梁振英 (CY Leung Chun Ying)	廉政專員 (Commissioner of ICAC)
	Q3	提名 (Nomination)	不公義 (Injustice)	公民抗命 (Civil Disobedience)
		公義 (Justice)	委員會 (Committee)	和半佔中 (Peaceful Occupation of Central)
		選民 (Voter)	民主派 (Democratic group)	公民社會 (Civic Society)
	Q4	大學 (Election)	曼德拉 (Mandela)	司法覆核 (Court of Final Appeal)
		兒子 (Son)	梁振英 (CY Leung Chun Ying)	新香港人 (New Hong Kong people)
		篩選 (Screening)	香港人 (Hong Kong people)	言論自由(Freedom of Speech)
2014	Q1	傳媒 (Media)	香港人 (Hong Kong people)	新聞自由 (Freedom of Press)
		明報 (Ming Pao)	劉進圖 (Kevin Lau)	言論自由 (Freedom of Speech)
		民主 (Democracy)	李慧玲(Li Wei-ling)	公衆利益 (Public Interest)
	O2	中共 (Chinese Communist)	香港人 (Hong Kong people)	公民提名(Civil Nomination)
	-	民主 (Democracy)	民主派 (Democratic Group)	和平佔中 (Peaceful Occupation of Central)
		公民 (Citizen)	提委會 (Nominating Committee)	選舉辦法 (Flection rules)
	03	民主 (Democracy)	香港人 (Hong Kong people)	公中加口 (Livil Disobadiance)
	25	辞理 (Scrooning)	齿柱失 (Take it on board first)	和亚住山/Pogoaful Occupation of Control
		邮速 (Screening) 转金 (Disch discuss)	※正元 (Take it on board infst) 法律界 (Less Circles)	和日田中(reaceiul Occupation of Central) 司法獨立 (Indiaian-Indiana)
	04	①1.叩(Disobedience) ()()()()()()()()()()()()()()()()()()()	伝律介 (Law Circles) 禾準人 (Lawa Kana and La	可伝測立 (Judiciary Independence)
	Q^4	理則 (Citizen)	音他八 (Hong Kong people) 源振英 (CVL) - CL - V(-)	内土理則 (Democratic Movement) 公司協会 (Civit D: 1, 1:)
		別率 (Umbrella)	采振央 (CY Leung Chun Ying)	公氏扒帀 (Civil Disobedience)
		民主 (Democracy)	候選人 (Candidate)	聯合聲明 (Joint Declaration)

	Table 5: Phrase with hig	hest χ^2 and used b	y pro-Democracy	politicians in each	year and quarter
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ii Regress the relative frequencies of the selected phrases in newspaper $n \tilde{f}_{pn}$ on $\Delta \tilde{f}_p$. The slope estimates, which is our estimate of slant, gives:

$$\theta_{n} = \frac{\sum_{p=1}^{80} \Delta \tilde{f}_{p} f_{pn}}{\sum_{p=1}^{80} \Delta \tilde{f}_{p}^{2}}$$
(6)

This approach is a slight variation of Gentzkow and Shapiro (2010). Gentzkow and Shapiro (2010) uses speech by all congressmen as references and therefore need to separately account

for their individual ideological leaning. I can bypass this step because I have a single reference for each end of the ideology spectrum.

To illustrate the working of the slant estimate, note that the larger the difference of the relative frequencies Δf of a phrase, the more pro-Democracy the phrase implies. If the news report uses that phrase more often, the slant estimate of the newspaper will become more positive. Slant gap is calculated by subtracting the slant of Oriental Daily from that of Apple Daily ($\Delta \theta = \theta_A - \theta_O$). In politically turbulent periods, newspapers presumably use more phrases that are more telling of their political stance. Their word choice would then be closer to the respective reference, and further away from each other's reporting, thereby increasing the slant gap.

The evolution of the slant gap between the two newspapers is presented in figure 6. A large difference indicates that the reports in the two newspapers are closer to their respective reference rhetoric in that period. In all but one period, slant gap is positive, which aligns with the perception that Apple is more pro-Democracy than Oriental. Importantly, periods with large slant gap correspond to periods that both quantitative and qualitative evidence would suggest are more politically polarizing. For example, slant gap increases sharply in third quarter of 2012, which aligns with the timing of the National and Moral Education controversy. First and second quarter of 2014 also register large slant gap. In these two quarters, the White Paper controversies and the physical assault on the liberal journalist took place. Notably, quarter 4 of 2014, during which the Umbrella Movement erupted, has the highest slant gap in the sample period.



Figure 6: Difference in slant between the two newspapers.

It should be pointed out that the slant measure does not tell us whether the newspapers' report slant becomes more or less extreme in a given period. The reason is that word choices of the reference rhetoric also changed over time. Certain words are ideologically relevant in some periods but not others. One might also reasonably suspect that the set of "ideology-telling" phrases became more polarized in politically sensitive periods, so our measure will underestimate the absolute slant gap. In the appendix, I consider a measure of polarization of the reference rhetoric over time to access this possibility.

5.3 Validating the Slant Gap Measure

Our premise is that slant gap reflects the concurrent political climate: more intense political events trigger a larger slant gap because the media is compelled to take a stance in their reporting. While I have shown in figure 6 that sharp increases in slant gap are associated with occurrences of high-profile political events, to further validate the measure, I consider a proxy for the intensity of political events: number of protesters on street. Since protest is a clear political expression, the number of protesters on street could convey a sense of the prevalence of dissatisfaction towards the government.³⁷

A number of protests erupted in our sample period. While the specific demand of each protest differed, all but one could be classified as dissatisfaction towards the government. I present the estimated total number of protesters (estimated by the public opinion program of Hong Kong University³⁸) for each quarter in table 6. The Pearson correlation between the number of protesters and slant gap is 0.419 with a two-tailed p-value of 0.066. Since the number of observation is limited to 20 quarters, our result inevitably suffers from a lack of power. Nevertheless, the positive and mildly significant correlation between the two time series reassures us that slant gap moves in the same direction as number of protesters.

³⁷Acemoglu et al (2014) used a similar approach in estimating the effect of protests in Arab Springs on Egyptian stocks

³⁸The website: https://www.hkupop.hku.hk/english/features/rallies/summary.html. The website provides an estimated range of the number of protesters for each protest, and I use the middle of the given range.

Date	Protest	Number of Participants (Estimated)
2010/1/1	New Year Protest	10000-12000
2010/7/1	Annual July 1st Protest	22000-26000
2011/7/1	Annual July 1st Protest	59000-67000
2012/4/1	Protest against Mainland Influence on the Chief Executive Election	Few thousands
2012/06/10	Death of Li Wangyang	25000
2012/7/1	Annual July 1st Protest	90000-100000
2012/7/29	National and Moral Education	90000
2012/12/30	Support Leung Protest	50000
2013/1/1	New Year Protest	30000-33000
2013/7/1	Annual July 1st Protest	88,000-98,000
2013/10/20	HKTV Free Licence Controversies	120,000
2014/1/1	New Year Protest	13,000-16,000
2014/3/2	Kevin Lau Knife Attack	13,000
2014/6/27	White Paper Controversies	1800
2014/7/1	Annual July 1st Protest	150,000 - 166,000
2014/8/17	Anti- Occupy Central	79,000-88,000
2014/9/25	Student Protest for Universal Suffrage	4000
2014/09/28-2014/12/11	Umbrella Movement	> 200,000

Note: The estimate of the number of participants comes from the public opinion programme conducted by the University of Hong Kong.

Table 6: List of Major Protests in Hong Kong between 2010 and 2014

6 Empirical Evidence

The first model prediction says that Apple Daily's ad share falls in politically turbulent periods. To test that, I regress Apple's quarterly ad share relative to Oriental on slant gap. Without any controls, the resulting coefficient on slant gap is negative and statistically significant at the 5% level.³⁹ To investigate heterogeneity of industry responses, I regress Apple's ad share in each of the 17 industries on slant gap separately. Slant gap has a negative and significant effect in 5 of them: banking, electronics, real estate, restaurants and the telecommunication. For the other industries the coefficient is insignificant, but neither has a positive and significant effect, which supports the model prediction that larger slant gap negatively affects Apple's advertising.⁴⁰

The next model prediction says that ad price between Apple Daily and Oriental Daily diverges in turbulent times. The first two columns of table 2 show the ad price of a full-color page in the run-of-paper for each year in the sample period.⁴¹ In 2010, Apple's ad price was 81% of Oriental Daily's. The ratio increased to 94% in 2012 but dropped to 73% in 2014. Despite the increase in price gap in 2014, Apple Daily's relative advertising volume declined considerably. Given the short time series and the absence of ad price information in the dataset for individual ads, I am unable to conduct more systematic empirical analysis but the pattern broadly supports the model's second prediction.

Next, I test the third model prediction that Beijing-friendly firms are less likely to advertise

³⁹The coefficient on the slant gap is -0.0628 and the p-value is 0.037.

⁴⁰I also regress Apple's ad share on the quarterly share of Beijing-friendly ads to investigate if fluctuation in Beijing-friendly ads over time could explain aggregate ad share fluctuation. I do not find any significant effect. The coefficient is 0.67 and the p-value is 0.22.

⁴¹Newspapers charge different prices for ads at different positions, size and color scheme.

on Apple in all periods by estimating a logistic regression model. From the firm's perspective, there are three possible choices of advertising outlets: Apple (A), Oriental (O) or both Apple and Oriental (AO). I lumped A and AO into one category to estimate a binary outcome model. I do not use a multinomial logistic regression because 1). I care about Apple being chosen in one way or another and not just exclusively, and 2) the choice categories are not mutually exclusive.

$$P(y_{itq} = b) = \beta_0 + \beta_1 c_i + \beta_2 X_i + \delta_{tq} + v_{ib}, \qquad b = \{AorAO, O\}$$
(7)

where y_{itq} is the newspaper choice of firm *i* in quarter *q* of year *t*. $c_i = 1$ if firm *i* is classified as Beijing-friendly firm, which includes politically-connected, and mainland firms. X_i is a vector of firm-specific characteristics including the region of origin, whether the advertiser is a local government entity or not-for-profit organization, and industry fixed effects. Industry fixed effects control for industry-specific preference for a certain newspaper. It is comprised of both market-based as well as political preference for a newspaper. For example, the sporting goods industry might find Apple Daily more attractive because young people are more likely to be pro-Democracy and purchase sports products. The fixed effect will take into account for these market-based preferences that are inferred by the readership demographics. However, it also accounts for potential industry-specific political preference. For example, if the real estate industry, whose business is more dependent on relationship with the mainland government, exhibited an industry-wide aversion to advertise on Apple due to political reasons, the effect is also captured in the fixed effects. δ_{qt} are time controls that include dummies for each quarter in the year, a linear and quadratic time trend.

The unit of analysis used in the main table is an ad assignment. I also present the main regression results using an ad as the unit of analysis in the appendix. In this alternative formulation, an ad is considered to be Connected as long as at least one of its advertisers is connected, and likewise for Foreign and Mainland ads. I prefer using ad assignment as the unit of analysis because bigger ads tend to have more advertisers, and using ad assignment can at least partially address the issue that not all ads are equal. However, our main results discussed in the main text are robust to using ad as the unit of analysis. In addition, I did not use firm-level variable such as the number of ads per firm as the dependent variable because the ad level analysis allows us to control for ad-specific attributes such as the product of the ad, which might differ across ads for the same firm. Some companies also have businesses in multiple industries, which makes it difficult to control for ad-level industry effect.

The result is presented in table 7. In the first three columns I use the full sample of ad assignments, and in columns 4-6 I only include ad assignments with a HKSE-listed firm.⁴² The HKSE-listed firms are usually larger by the number of employees and revenue, and have heavier exposure to the mainland market so I separately estimate the effect of the independent variables on them. In columns 1 and 4, I include industry fixed effects. In columns 2 and 5, I additionally include quarter and industry-quarter fixed effects to control for quarter and industry specific preference for a newspaper. In columns 3 and 6, I add a linear and quadratic

⁴²I do not include control on government, and not-for-profit in the HKSE sample as the sample only have HKSE companies.

time trend to control for other time-related variations that can potentially explain the decline of Apple Daily's desirability to advertisers.

		Depende	ent variable:	1 if A or AO	is chosen	
Connect	-0.1765***	-0.1607***	-0.1694***	-0.0217	-0.0073	-0.0142
	0.000	0.000	0.000	0.201	0.672	0.411
	(-0.0441)	(-0.0400)	(-0.0422)	(-0.0054)	(-0.0018)	(-0.0035)
Foreign	0.0814***	0.0623***	0.0851***	0.3113***	0.2636***	0.2549 ***
Ū.	0.000	0.000	0.000	0.000	0.000	0.000
	(0.0204)	(0.0155)	(0.0212)	(0.0775)	(0.0654)	(0.0634)
Mainland	-0.7762***	-0.8445***	-0.8316***	-0.9359***	-1.0202***	-1.0015***
	0.000	0.000	0.000	0.000	0.000	0.000
	(-0.1940)	(-0.2102)	(-0.2073)	(-0.2329)	(-0.2530)	(-0.2489)
Government	-0.0856	-0.0890	-0.0835			
	0.117	0.105	0.128			
	(-0.0214)	(-0.0221)	(-0.0208)			
Industry FE	х	х	Х	х	Х	Х
Quarter FE		Х	Х		Х	Х
IndustryQuarter FE		Х	Х		Х	Х
Linear Time Trend			Х			Х
Quadratic Time Trend			Х			Х
Observations	300607	300607	300607	68116	68116	68116

Note: *p<0.1; **p<0.05; **p<0.001. The unit of analysis is ad assignment. The first row of each variable shows the coefficient, the second row shows the p-value, and the third row shows the marginal effect at the median. Column (1) - (3) uses the full sample, and column (4) - (6) uses the HKSE-listed sample only. Industry classification consists of the following categories:Automobile, Baby products, Banking, Beauty, Computers, Education, Electronic Appliances, Fashion and Accessories, Food & Beverages, Insurance, Pharmaceutical, Real Estate /property, Restaurants, Retail, Sports, Telecommunication, Travel (airline, hotel).

Table 7: Logit Regression Results

The coefficient of "Connect" is negative and significant at the 1% level for all specifications using the full sample. Adding extra industry and time controls does not alter the magnitude of the coefficient significantly and the coefficient remains highly significant. The same pattern holds for mainland firms as well. This supports the model prediction that Beijing-friendly companies are less likely to advertise on a pro-Democracy newspaper. The magnitude of the coefficient of "Connect" in the HKSE-listed firm sample is insignificant. This result suggests that among the listed corporations, being connected does not have as much explanatory power on individual firms' decision to advertise on Apple Daily. HKSE-listed firms are already more likely to have heavy exposure to the mainland market, so being Connected yields less explanatory power on firms' advertising decisions. This is consistent with the preferred interpretation that firms that heavy exposure to the mainland market were more likely to exhibit aversion from Apple Daily. On the other hand, listed foreign (mainland) companies are more (less) likely to advertise on Apple Daily companies are more (less) likely to advertise on Apple Daily companies are more (less) likely to advertise on Apple Daily companies are more (less) likely to advertise on Apple Daily companies are more (less) likely to advertise on Apple Daily companies are more (less) likely to advertise on Apple Daily compared with other listed firms. The effect of being "foreign" on newspaper choice is noticeably stronger in the HKSE-listed sample.

To determine the effect in probability scale, I calculate the marginal effects at the median, as shown in parenthesis in the same table. Using the first specification, our result implies that connected companies are 4.4% and mainland companies are 19.4% less likely while foreign companies are 2.0% more likely to advertise on Apple at the median. The result suggests that the aversion to Apple was stronger for mainland companies than connected companies, while foreign companies were more fond of Apple. It is possible that foreign companies were not as aware or concern about the political stances of the newspapers or simply preferred the newspaper with better cost-effectiveness. But our analysis does not allow me to separate the two effects.

In table 7, I also show that ads from the local government bureaucracy do not have a strong preference for Oriental Daily over Apple Daily, which suggests that the local government bureaucracy are more impartial than profit-motivated private firms. This seems puzzling in the first place but since before the handover, the Hong Kong government departments and agencies were supposed to remain "political neutral", meaning that public services should not be influenced by political factors (Scott, 1996). While the number of local government ads represented a small portion of the overall ad pool and that local and central government are quite different in nature, the finding stands in contrast to previous evidence that suggests government exchanges favor with the media through ad allocation of government-controlled bodies (Di Tella and Franceschelli (2011) and Szeidl and Szucs (2017)), which underscores the incentive-based mechanism explored in this paper.

Firms within the same industry could target different demographic groups. For example, within the broad restaurant industry, more expensive restaurant might target the affluent population whereas the more affordable fast-food chain might target younger family. While this speaks to the difficulty to control for all market-based preference, which is also complicated by the fact that assigning each ad to specific target demographic group inevitably involves some degree of subjectivity, many ad products and services in our dataset such as travel and banking ads have broad appeal and aim to reach a wide demographics.

Could the observed pattern a result of Apple Daily's refusal to print ads from companies that it dislikes? Many politically-connected, as well as the mainland advertisers are large corporations that have business in multiple sectors and their ads are devoid of any political content. Turning away ads from politically-connected companies means turning away ads from a wide array of companies. This translates to a large voluntary advertising revenue loss, which is arguably difficult for Apple to justify financially to its shareholders.

I test the last model prediction that firms are less likely to advertise on Apple in politically sensitive periods next. To do that, I estimate the following logit model:

$$P(y_{itq} = b) = \beta_0 + \beta_1 c_i + \beta_2 \triangle \theta_{tq} + \beta_3 c_i \cdot \triangle \theta_{tq} + \beta_4 X_i + \delta_{tq} + \nu_{ib}, \qquad b = \{AorAO, O\}$$
(8)

This estimating equation is the same as equation 7 with the addition of $\triangle \theta_{tq}$ and $c_i \cdot \triangle \theta_{tq}$. $\triangle \theta_{tq}$

represents the slant gap in quarter q of year t whereas $c_i \cdot \Delta \theta_{tq}$ represents the interaction between firm characteristics dummy and slant gap. β_2 is expected to be negative: the larger the slant gap, the less likely a firm would advertise on Apple. β_3 measures the possible differential impact of newspapers' slant gap on firms of different characteristics.

The result is presented in the top panel of table 8. The coefficient of $\Delta \theta_{tq}$ is negative and significant at 1% level in all 3 specifications. The magnitude attenuates only slightly as more controls are added. As noted previously, Apple's combined print and online readership remained flat whereas that of Oriental had declined. While the data does not allow us to separate out the print readership only, the set of linear and quadratic time trend controls for a possible decline in print readership. Using the most liberal specification in column (1), the result implies that one unit increase in slant gap decreases firms' probability of advertising in Apple by 12.5% at the median. To put the number in context, the average slant gap in 2014 is 0.454, which translates to a 5.7% decrease in likelihood to advertise on Apple. Using the HKSE-listed sample, the magnitude of coefficient for all 3 specifications become smaller but the coefficients are still significant at 1% level of significance. The results confirm the model predictions that slant gap negatively affects firms' likelihood to advertise on Apple Daily.

Our slant gap unit of measurement is set to quarterly. As a result of the relatively wide window, the observed advertising decision could happen before a major political event in that quarter took place. To address this issue, I replace slant gap and all the slant gap interaction in equation 8 with one-quarter lagged slant gap in a separate specification. The result is presented in the bottom panel of table 8. In all six columns, lagged slant gap has a negative and significant effect. Comparing these coefficients with those of $\Delta \theta_{tq}$ in table 8, the magnitude of the effect is stronger among the listed firms when $\Delta \theta_{tq-1}$ is the independent variable but quite similar when the full sample is used.

Coefficients of the interaction between mainland or connected firms and slant gap are insignificant using the contemporaneous slant gap. However, there is some evidence that suggests the intensity of aversion among mainland firms, but not connected firms, increased during more polarized periods, when lagged slant gap is used. Though inconclusive, the result is consistent with previous finding that mainland firms exhibited stronger aversion to Apple Daily than their connected companies counterparts. There is some weak evidence that suggests foreign firms were more likely to advertise on Apple Daily in turbulent times.

To address the concern that firms' response to slant gap is due to more efficient ad targeting via improved newspaper-reader ideology match, I examine the interactions between slant gap and industries fixed effects. If firms response to slant gap is driven by market-based preference, I expect industries that predominately target young (old) customers would respond to slant gap more strongly (weakly) than other industries which have more diverse customer demographics.⁴³ Age is a strong predictor of political preference, and younger people are much more like to support the pro-Democracy movement than the older counterparts so there were

⁴³An example of a "young" industry is the Education industry whereas an example of a "old" industry is the Pharmaceutical industry.

		Depend	ent variable:	1 if A or AO	is chosen	
$\Delta \theta_{ta}$	-0.4987***	-0.4856***	-0.2228***	-0.5576***	-0.4579***	-0.1474*
	0.000	0.000	0.000	0.000	0.000	0.09
	(-0.1247)	(-0.1211)	(-0.0555)	(-0.1386)	(-0.0648)	(-0.0366)
Connect· $\Delta \theta_{tq}$	-0.0481	-0.0428	-0.0085	0.0720	0.0201	0.1286
,	0.435	0.489	0.891	0.464	0.838	0.194
	(-0.0120)	(-0.0107)	(-0.0021)	(0.0179)	(0.0225)	(0.0319)
Mainland $\cdot \triangle \theta_{tq}$	-0.2066	-0.2108	-0.2065	-0.3220	-0.3025	-0.2761
	0.167	0.162	0.175	0.242	0.279	0.325
	(-0.0516)	(-0.0526)	(-0.0514)	(-0.0800)	(-0.0723)	(-0.0685)
Foreign $\cdot \Delta \theta_{tq}$	0.0907*	0.0750	0.1325***	0.0640	0.0459	0.0597
	0.057	0.117	0.006	0.693	0.779	0.715
	(0.0227)	(0.0187)	(0.0330)	(0.0159)	(0.0144)	(0.0148)
Observations	300607	300607	300607	68116	68116	68116
$\Delta \theta_{tq-1}$	-0.3107***	-0.5223***	-0.3112***	-0.6870***	-0.8572***	-0.5883 ***
,	0.000	0.000	0.000	0.000	0.000	0.000
	(-0.0773)	(-0.0940)	(-0.0764)	(-0.1631)	(-0.1633)	(-0.1430)
Connect· $\triangle \theta_{tq-1}$	0.1116	0.1405**	0.1291*	0.5738***	0.5577***	0.5425***
,	0.102	0.040	0.060	0.000	0.000	0.000
	(0.0278)	(0.0333)	(0.0317)	(0.1362)	(0.1324)	(0.1319)
Mainland $\cdot \triangle \theta_{tq-1}$	-0.3189**	-0.2723*	-0.2315	0.0410	0.0954	0.1664
	0.044	0.088	0.148	0.883	0.736	0.558
	(-0.0793)	(-0.0604)	(-0.0568)	(0.0097)	(0.0317)	(0.0405)
Foreign $\cdot \Delta \theta_{tq-1}$	0.0725	0.0717	0.0668	-0.5770***	-0.5966***	-0.61560***
	0.168	0.175	0.207	0.000	0.001	0.001
	(0.0180)	(0.0170)	(0.0164)	(-0.1370)	(-0.1457)	(-0.1497)
Observations	287754	287754	287754	65215	65215	65215
Industry FE	Х	Х	Х	Х	Х	Х
Quarter FE		Х	Х		Х	Х
IndustryQuarter FE		Х	Х		Х	Х
Linear Time Trend			Х			Х
Quadratic Time Trend			Х			Х

Note: *p<0.1; **p<0.05; ***p<0.001. The unit of analysis is ad assignment. Column (1) - (3) uses the full sample, and column (4) - (6) uses the HKSE-listed sample only. The first row of each variable shows the coefficient, the second row shows the p-value, and the third row shows the marginal effect at the median. Firms characteristics include political connectivity and country of origin (foreign, mainland). Industry classification consists of the following categories: Automobile, Baby products, Banking, Beauty, Computers, Education, Electronic Appliances, Fashion and Accessories, Food & Beverages, Insurance, Pharmaceutical, Real Estate /property, Restaurants, Retail, Sports, Telecommunication, Travel (airline, hotel).

Table 8: Results on Slant Gap and Interactions

presumably more young readers in turbulent periods. To examine this empirically, I modified the estimating equation 8 to also include the interactions of slant gap and industries. The result is presented in the appendix. None of the coefficient of the interactions is significant using the most liberal specification, which suggests that industries that target different demographic group did not exhibit extra aversion to Apple Daily in turbulent times.

Ad Position: The model only yields prediction on firms' choice of newspaper. In practice, firms can discriminate a newspaper on ad characteristics as well. For example, a firm can place a large color ad on the front page on one newspaper and a small gray-scale ad in the least-popular section on the other newspaper. This is clearly a concern for firms that advertised on both newspapers but given that only small amount of ads appeared on both newspapers, the extensive margin is the more important margin in our overall analysis.

However, among Apple Daily advertisers, it is still possible that connected firms were more likely to advertise in the less desirable sections on Apple Daily. I use data on ads' position, which is given as the newspaper section and section page number that the ad appeared, to investigate this hypothesis. Section A of the newspaper indicates the stack at the top of the newspaper and A1 is the first page of the stack which is the headline news. Likewise, section B is the second stack from the top and B1 is the first page in that stack. Each section focuses on a specific type of news. For example, section A is usually the "hard news" on topics like politics and business, whereas news in section B is related to stock/real estate market and section C is on entertainment. Section A is generally more desirable than the other sections for advertisers, as evident by the fact that it costs more to run an ad in section A than in the run-of-page.⁴⁴. I therefore modeled ad position as a binary variable: 1 if the ad is in section A, and 0 otherwise

Table 9 presents the regression results using the same right hand side variables specified in equation 8 and ad position as the dependent variable. Unlike previous analysis, this analysis only uses ads that appeared on Apple Daily. Ads from foreign firms were much more likely to appear on section A, and mainland firms the opposite. And in both the full and the HKSE-listed sample, the interaction terms between "Connect" and "Slant" are negative and significant at the 1% level in the most liberal specification while the interaction terms between "Foreign" and "Slant" are positive and significant at the 5% level across all specifications. This supports the notion that ads from connected companies were more likely to appear further away from the front pages in turbulent periods, and the opposite holds for foreign companies.

Persistence of Slant Gap's Effect: Firms are unlikely to have short memory on newspapers' reporting slant. In particular, slanted newspaper reporting in turbulent periods could have a lingering impact on firms' decision because advertisers might form a stronger impression on more polarized reporting. To examine the effect of this channel, I include both the contemporaneous and lagged slant gap in the logistic regression:

$$P(y_{itq} = b) = \beta_0 + \beta_1 c_i + \beta_2 \triangle \theta_{tq} + \beta_3 \triangle \theta_{tq-1} + \beta_4 c_i \cdot \triangle \theta_{tq} + \beta_5 c_i \cdot \triangle \theta_{tq-1} + \beta_4 X_i + \delta_{tq} + \nu_{ib}, \qquad b = \{AorAO, O\}$$
(9)

The result is presented in table 10. Columns (1) - (3) use the full sample and columns (4) - (6) use the HKSE-listed sample. Both contemporaneous and lagged slant gap are negative and highly significant in all specifications. The magnitude of the coefficients of both contemporaneous and lagged slant gap are greater using the HKSE-listed sample than using the full sample. Using the full sample, the coefficients of the contemporaneous slant gap are stronger than that of the

⁴⁴See evidence: http://www.thestandard.com.hk/banners/PrintAdRate.pdf

	Depend	lent variable	: 1 if the ad a	ppeared in sec	tion A of Ap	ple Daily
Connect	-0.0343	-0.0367	-0.0446	-0.0015	-0.0046	0.0032
	-1.237	-1.321	-1.608	-0.034	-0.102	0.072
	(-0.0075)	(-0.0080)	(-0.0099)	(-0.0003)	(-0.0009)	(0.0006)
Mainland	-0.2583***	-0.2724***	-0.2683***	-0.8137***	-0.8669***	-0.8356***
	-3.387	-3.578	-3.548	-5.353	-5.633	-5.508
	(-0.0562)	(-0.0594)	(-0.0596)	(-0.1527)	(-0.1700)	(-0.1593)
Foreign	0.1607***	0.1359***	0.1309***	-0.0003	0.0121	0.0338
	7.785	6.570	6.334	-0.004	0.175	0.489
	(0.0349)	(0.1249)	(0.0291)	(-5.429e-05)	(0.0024)	(0.0064)
$\Delta \theta_{tq}$	0.4406***	0.5392***	0.0887*	0.1518	0.1836	-0.1545
	9.552	11.377	1.693	1.090	1.288	-1.021
	(0.0958)	(0.1176)	(0.0197)	(0.0285)	(0.0360)	(-0.0295)
Connect· $\Delta \theta_{tq}$	-0.2358**	-0.2157**	-0.2580**	-0.3837**	-0.3425**	-0.51949***
	-2.281	-2.087	-2.499	-2.234	-1.981	-3.016
	(-0.0513)	(-0.0471)	(-0.0573)	(-0.0720)	(-0.0672)	(-0.0990)
Mainland $\cdot \triangle \theta_{tq}$	-0.0280	-0.0288	-0.0343	-0.1162	-0.1255	-0.1261
	-0.097	-0.099	-0.119	-0.171	-0.181	-0.185
	(-0.0061)	(-0.0063)	(-0.0076)	(-0.0218)	(-0.0246)	(-0.0240)
Foreign $\cdot \triangle \theta_{tq}$	0.5424***	0.5724***	0.4832***	0.4986**	0.4790^{*}	0.4724^{*}
	7.256	7.636	6.446	1.977	1.886	1.864
	(0.1179)	(0.0297)	(0.1073)	(0.0936)	(0.0939)	(0.0901)
Industry FE	Х	Х	Х	Х	Х	Х
Quarter FE		Х	Х		Х	Х
IndustryQuarter FE		Х	Х		Х	Х
Linear Time Trend			Х			Х
Quadratic Time Trend			Х			Х
Observations	133191	133191	133191	27342	27342	27342

Note: *p<0.1; **p<0.05; ***p<0.001. This table reports the results of a logit model with the same specification as equation 8 but using ad position as the dependent variable. The unit of analysis is ad assignment. The first row of each variable shows the coefficient, the second row shows the p-value, and the third row shows the marginal effect at the median. Column (1) - (3) uses ads that appeared in Apple Daily only, and column (4) - (6) uses ads that appeared on Apple Daily and were from HKSE-listed companies only. The second row of the coefficients prints the p-value and the third prints the marginal effects at the median. Firms characteristics include political connectivity and country of origin (foreign, mainland). Industry classification consists of the following categories: Automobile, Baby products, Banking, Beauty, Computers, Education, Electronic Appliances, Fashion and Accessories, Food & Beverages, Insurance, Pharmaceutical, Real Estate /property, Restaurants, Retail, Sports, Telecommunication, Travel (airline, hotel).

Table 9: Results of the logit model using ad's position

lagged slant gap, supporting the notion that newspaper's slant could have lingering impact on firms' choice of newspaper.⁴⁵

I also examined the interactions between contemporaneous and lagged slant gaps with the firms' characteristics. In all specifications, the coefficient on the interaction term between "mainland" and contemporaneous slant gap is negative and significant. This provides further

⁴⁵The autocorrelation of the slant gap time series is relatively low at 0.13 with a 95% confidence interval between -0.31 and 0.57, which implies that the lagged slant gap is not predictive of contemporaneous slant gap.

evidence that mainland firms exhibited more aversion during turbulent periods. I did not extend our analysis to consider longer lags because of data limitation, but occurrence of larger and more intense political events are likely to have a longer lasting effect than smaller ones.

		Depende	ent variable:	1 if A or AO	is chosen	
$\Delta \theta_{tq}$	-0.5648***	-0.4508***	-0.2643***	-0.6824***	-0.5221***	-0.2720***
	0.000	0.000	0.000	0.000	0.000	0.002
	(-0.1129)	(-0.0850)	(-0.0648)	(-0.1311)	(-0.0903)	(-0.0656)
$\Delta \theta_{tq-1}$	-0.2123***	-0.3999***	-0.2803***	-0.5440***	-0.7027***	-0.5404***
	0.000	0.000	0.000	0.000	0.000	0.000
	(-0.0953)	(-0.0804)	(-0.0687)	(-0.1752)	(-0.1444)	(-0.1304)
Connect· $\triangle \theta_{tq}$	0.1485**	0.15515**	0.1490**	0.2961***	0.2870***	0.2850**
,	0.018	0.014	0.018	0.003	0.005	0.005
	(0.0395)	(0.0374)	(0.0365)	(0.0758)	(0.0690)	(0.0688)
Mainland $\cdot \Delta \theta_{tq}$	-0.3497**	-0.3347**	-0.3300**	-1.1269***	-1.1168***	-1.1385***
,	0.022	0.028	0.031	0.000	0.000	0.000
	(-0.0883)	(-0.0816)	(-0.0809)	(-0.2679)	(-0.2691)	(-0.2747)
Foreign $\cdot \Delta \theta_{tq}$	0.2909**	0.2907***	0.2754***	0.1704	0.1859	0.1759
	0.000	0.000	0.000	0.302	0.265	0.292
	(0.0728)	(0.0702)	(0.0675)	(0.0430)	(0.0450)	(0.0424)
Connect· $\triangle \theta_{tq-1}$	0.0851	0.1125	0.1061	0.4961***	0.4853***	0.4791***
	0.218	0.106	0.128	0.000	0.000	0.000
	(0.0201)	(0.0271)	(0.0260)	(0.1197)	(0.1155)	(0.1156)
Mainland $\cdot \triangle \theta_{tq-1}$	-0.2165	-0.1817	-0.1531	0.3633	0.4183	0.4782
	0.184	0.268	0.352	0.217	0.160	0.110
	(-0.0488)	(-0.0405)	(-0.0375)	(0.0976)	(0.1059)	(0.1154)
Foreign $\cdot \triangle \theta_{tq-1}$	0.0230	0.0197	0.0213	-0.6017***	-0.6263***	-0.6444***
	0.666	0.713	0.692	0.001	0.001	0.000
	(0.0056)	(0.0050)	(0.0052)	(-0.1490)	(-0.1519)	(-0.1555)
Industry FE	х	х	х	х	х	х
Quarter FE		Х	Х		Х	Х
IndustryQuarter FE		Х	Х		Х	Х
Linear Time Trend			Х			Х
Quadratic Time Trend			X			Х
Observations	287754	287754	287754	65215	65215	65215

Note: *p<0.1; **p<0.05; ***p<0.001. This table reports the results of a logit model with both contemporaneous and lagged slant gap (among others) as the independent variables. The unit of analysis is ad assignment. Column (1) - (3) uses the full sample, and column (4) - (6) uses the HKSE-listed sample only. The first row of each variable shows the coefficient, the second row shows the p-value, and the third row shows the marginal effect at the median. Firms characteristics include political connectivity and country of origin (foreign, mainland). Industry classification consists of the following categories: Automobile, Baby products, Banking, Beauty, Computers, Education, Electronic Appliances, Fashion and Accessories, Food & Beverages, Insurance, Pharmaceutical, Real Estate /property, Restaurants, Retail, Sports, Telecommunication, Travel (airline, hotel).

Table 10: Results of the logit model including both contemporaneous and lagged slant gap in the regressors

7 Apple Daily's Revenue Loss

I am interested in separately estimating impact on Apple Daily's revenue in 2014 due to 1). heightened political sensitivities and 2). Beijing-friendly firms' preference for Oriental Daily over Apple Daily. To calculate the effect of 1), I use regressions results in table 8 to estimate what ad volume would have been in 2014 if the degree of political awareness remained fixed at its quarterly values in 2010. I focus on 2014 because both qualitative and quantitative evidences suggest that it is the most volatile year and political concern is expected to have the largest effect on advertisers' decision. To calculate the effect of 2), I use the results in table 7 to estimate the number of ads on Apple would have been placed by connected and mainland companies if they did not exhibit preference against the newspaper.

In order to calculate the impact on revenue, I would also need to know the size of ads but that information is absent in the Wisers dataset. To circumvent this issue, I collected a smaller, physical sample of 2045 ads from the archive of a Hong Kong public library and manually recorded the size and other ad characteristics of the following 10 dates in 2014: 3/6, 4/4, 5/3, 6/4, 7/1, 8/4, 9/6, 10/10, 11/3, 12/7. The dates are chosen arbitrarily to cover different months in the years and several politically important dates such as 6/4 (Annual anniversary of Tiananmen Square Massacre) and 7/1 (HKSAR establishment date and the annual protest to the government). The average ad size for all ads is 0.588 page, and connected and mainland ads is 0.783 page.

Revenue Impact of Political Salience - The average slant gap is 0.205 in 2010, and 0.454 in 2014. Slant gap is larger in all quarters in 2014 except quarter 3. Using the estimation result of -0.125 as the probability estimate corresponding to β_2 from column (1) in table 8 while holding the industry effects at their means, the increase in slant gap yields a 3.13 percent drop in probability of advertising on Apple.⁴⁶ This is equivalent to 584 ads loss.⁴⁷ I then multiplied the average ads size and the ad price in 2014 to the ad loss quantity to arrive at an revenue loss of \$HKD 78.2 millions (\$USD 10.0 million).⁴⁸

Revenue Impact of Aversion by Beijing-friendly firms - Connected companies are 4.4% and mainland companies 19.4% less likely to advertise on Apple in 2014 using the first specification in table 7. Connected firms accounts for 15% of a total of 18660 ads in 2014, and mainland firm 2.5%. This translates to a total of 214 ads loss, and a revenue loss of \$HKD 38.2 million (\$USD 4.9 million).⁴⁹⁵⁰

Putting the numbers in perspective, the ad revenue loss due to increased political salience amounts to 22.8% of Apple's 343.7 million \$HKD total advertising revenue, and Beijing-friendly

 $^{^{46}(0.454 - 0.205) * 12.5\% = 3.13\%}$

⁴⁷The combined (Apple + Oriental) ad quantity was 18660 in 2014. 18660 * 0.0313 = 584

⁴⁸The revenue impact due to neutral advertisers is : $584 * .588 page * 1886.8 cm^2 * 120.84\$/cm^2 = HKD 78,293,689$

 $^{^{49}}$ The expected number of ad loss due to firms' political connection: 18660*0.15*0.044 = 123 ads, and mainland firms: 18660*0.025*0.194 = 91 ads. Total ad loss: 123 +91 = 214

⁵⁰-214*.783 page *1886.8cm² * 120.84 $/cm^2$ = 38.2*million*

firms' political preference contributes to another 11.1%. These two channels sum to 33.9% of Apple's advertising revenue. In an economy where it is increasingly difficult for print media to remain profitable, the financial pressure due to politics on media is sizable, and it could very well persuade smaller newspapers to adopt a more pro-government political stance.

An obvious limitation of the above calculation is that endogenous ad price adjustment is not accounted for. Newspapers presumably adjusted the ad price in anticipation of heightened political awareness and to account for the fraction of Beijing-friendly firms in the pool of potential advertisers. Lowering the ad price potentially could mitigate the adverse revenue impact. However, given the short time series, I am unable to say much concerning the degree to which the evolving prices were due to these two channels.

Another limitation of this calculation is that I do not consider the possible existence of pro-Democracy companies. The existence of such companies would generate a politically-induced economic benefit for Apple. Our regression analysis suggests that foreign firms were more likely to advertise on Apple, but it is more plausible that foreign forms were simply reacting to a lower price-to-reader ratio rather than having a pro-Democracy preference. Finally, readers' interest in Apple might increase in volatile periods, leading to higher revenue from paper sales. Since our readership data is sparse and I do not observe readership composition at different time period, I cannot account for the effect of this possible channel.

8 Conclusions

This paper provides empirical evidence on the effect of newspaper's slant and firms' characteristics on advertisers' newspaper choice. Using daily advertising data on the two major newspapers in Hong Kong, I showed that an increase in political salience among advertisers in politicallyturbulent periods led to stronger aversion to advertise on the pro-Democracy newspaper. Furthermore, politically-connected and mainland firms exhibited stronger aversion to Apple Daily even in relatively stable periods. Using the regression results, I estimated that Apple Daily suffered from an ad revenue loss equivalent to 33.9% of its total advertising revenue in 2014 due to these two channel.

While Hong Kong has a unique political system, the implication of the findings is relevant to both democratic or nondemocratic countries where large businesses share cozy relationship with the government (e.g. South Korea⁵¹) or owned by the government (e.g. China, Italy or Hungary). This paper shows that businesses can inherit government's preference and behave as an extension of the state. The mechanism highlighted in this paper - politically-induced advertising pressure - can generate an unfavorable impact on the media's willingness to adopt a liberal political stance. This finding is especially important in an era when online news sites, of which the main source of revenue is advertising rather than readers subscription, become a dominant information channel.

⁵¹Schoenherr (2018) documented that politically connected firms in South Korea allocated contracts in favor of firms from the same connected network.

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