Relationship between advertising and consumption in China: Exploring the roles of economic development and mass media

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Abstract
The article investigates the dynamic interaction between national advertising spending and consumption in China from 1979 to 2014, including the media production in this process. The results show that the household consumption, economic openness, and economic freedom all positively predict advertising spending. As a peculiar combination of market economy and party-state controlled political system, there exists an asymmetry in the role of the government in terms of media advertising versus media product supply, and newspaper versus television. The ad-consumption elasticity is larger after 1992 than that before 1992, and newspaper ad is more sensitive to economic changes than TV advertising. The imbalance between media dual markets suggests there exists a semi-market in media industrialization in China. Media contents in China serve as both propaganda tool and advertising vehicle, and content production investment is mainly compensated by advertising.

Keywords
Advertising, economic freedom, economic openness, household consumption, market-oriented economy, responsiveness

Introduction
As one of the world’s largest advertising markets, China’s ad spending in traditional media fell for the first time in 2015, prompting concerns that the government is not doing enough to stabilize the
The Chinese economic model, with an authoritarian political system, presents an interesting case of the dynamic interaction between the advertising industry and national economy (e.g. gross domestic product (GDP), national consumption), especially during the recent so-called transition to a consumption-driven economic model (Holodny, 2015; Kurlantzick, 2013). Since the return of commercial advertising in 1979, soon after the Reform and Opening-up in 1978, total advertising revenues in China have rapidly increased from a mere 0.01 billion RMB Yuan in 1979 to 560.56 billion Yuan in 2014 (China Association of Advertising, 2015), indicating that advertising has become one of the fastest-developing industries in China. Advertising has a close relationship with GDP (Figure 1), and the same trend was observed in China as ad spending and economy grew correspondingly during the period. Previous studies have isolated several economic factors to play a role in the development of a country’s ad industry, namely, GDP (DiPietro, 2009), consumption (O’Donovan, Rae, & Grimes, 2000), sales (Hsu, Darrat, Zhong, & Abosedra, 2002), economic openness (Chang & Chan-Olmsted, 2005), and economic structure such as the percentage of manufacturing and service in GDP (Van der Wurff, Bakker, & Picard, 2008). Nevertheless, the dynamics of the China model from this advertising–economy perspective have not been investigated empirically thus far.

Additional insight can be garnered about the ad-econ dynamics from the media industry aspect. While party-state officials provide the Chinese media with monopolistic operating
licenses, advertisers are the media’s lifeblood. Both broadcast and print media have been heavily dependent on advertising revenues (Zhao, 2008, p. 84). With a goal of contributing to the knowledge in this area concerning the world’s most populated economy, this study would explore the interaction mechanism between advertising and economy in China after 1979. Special attention will be directed at the factors of consumption, economic conditions, and mass media in the ad-econ dynamics.

**Literature review**

*Interaction between advertising and economy (consumption, industrialization, economic openness, and economic freedom)*

Most ad-econ studies focused on the interaction between advertising and macro economy within a nation using time series national data (Ashley, Granger, & Schmalensee, 1980; Chowdhury, 1994; Deleersnyder, Dekimpe, Steenkamp, & Leeflang, 2009; Esteban-Bravo, Vidal-Sanz, & Yildirim, 2015; Hsu et al., 2002; Lischka, Kienzler, & Mellmann, 2014b; Picard, 2008). Some empirical studies employed panel data (Chang & Chan-Olmsted, 2005; Deleersnyder et al., 2009; Kopf, Torres, & Enomoto, 2011; Van der Wurff et al., 2008) or cross-sectional data (DiPietro, 2009). A few relevant studies addressed the relationship between advertising and sales at the industry level within a nation (Lischka et al., 2014b; Smart, 1988). As mentioned, most studies have suggested a positive relationship between advertising and economy. GDP, as a key economic indicator, was sometimes included in previous ad-economy studies, especially for cross-country comparisons (Chang & Chan-Olmsted, 2005; Deleersnyder et al., 2009; DiPietro, 2009; Picard, 2001; Van der Wurff et al., 2008). Consumption, often assumed as the result of increased advertising activities, was frequently employed in such studies, especially within one nation (Ashley et al., 1980; Jung & Seldon, 1995; Kalita & Ducoffe, 1995; Lischka, Kienzler, & Mellmann, 2014a; O’Donovan et al., 2000; Taylor & Weiserbs, 1972).

Compared with the relatively consistent, positive ad–economy relationship, the directions of their interaction turned out to be more differentiated. According to the activist point of view, advertising is an economical catalyst which can stimulate the consumers’ demand and eventually activate the economic growth (Jones, 2006; Kopf et al., 2011), a viewpoint popular among the advertising scholars and practitioners, who argued that advertising plays a centrally important part in the economic system of a country and is therefore an efficient market force (Ewing & Jones, 2000). On the other hand, the deterministic perspective claims that the origination and development of advertising is the result of economic growth. Contrary to the investment view of the activist perspective, this school of thought sees advertising as a kind of expenditure or demand. To sum up, advertising and economic growth may stimulate each other simultaneously in a circular pathway instead of a unidirectional way, especially at the firm level (Kopf et al., 2011).

Many communication studies on the advertising–economy relationship can be seen along the deterministic view, especially from the perspective of the Principle of Relative Constancy (PRC). The concept originally stated that “the level of spending on mass media by consumers and advertisers is determined by the general state of the economy, and any change in the level of the economy causes a parallel change in spending on mass media” (i.e. constancy assumption). Its second notion is that there is a tremendous ebb and flow of spending among the various media, which is called functional equivalence assumption. The two conclusions are jointly known as the PRC (McCombs, 1972). Most of the PRC studies focused on the relationship between the consumers’ media spending
and economy (e.g. income or consumption), but some of them also examined the relationship between advertising and economy (e.g. GDP; Chang & Chan-Olmsted, 2005; Demers, 1994; Glascock, 1993; Van der Wurff et al., 2008). However, the PRC only received limited supports, especially after the advent of new media technologies (Dupagne, 1994, 1997; Son & McCombs, 1993; Wood, 1986; Wood & O’Hare, 1991).

Like its Western counterparts, the development of Chinese advertising is related to its economic conditions. Zhao (2015) pointed out that the total retail sales of consumer goods are closely related to ad spending in China. As national policy shifted from class struggle to economic reform, the Chinese media, including its advertising, embodied and contributed to this reorientation since 1979, when China restored commercial advertising practices, and especially after 1992, when it instituted its form of market economy (Akhavan-Majid, 2004).

The budgeting method used by advertising practitioners was relatively simple in China and based on percentage-of-sales or affordable amount of money, which conforms to the practitioners’ rule of thumb to use a certain share of past sales for advertising expenditures (Lischka et al., 2014b). These practices, coupling with the Chinese culture of living within one’s means, add weight to the aforementioned deterministic viewpoint.

As a marketing tool, advertising was adopted for promoting mainly nonagricultural products and services in China. As China transitioned from agriculture to more manufacturing and service economy, the intensity of advertising activities increased. In more recent years, the move toward domestic consumption quickened as the country began an overhaul aimed at reducing the reliance on state-driven investment and the manufacturing sector, and rebalancing these economic activities with consumption (Wassener, 2014). While consumerism might be on the rise in China, its economic growth since 1978 depends largely on the successful implementation of industrialization (Huang, 2015). China’s industrialization process was rapid and accompanied by the emergence of powerful industrial concentration, regional specialization, and geographical clustering that elevated China’s export-oriented economy (Long & Zhang, 2012). The compressed industrialization and rapid urbanization improved social mobility and nurtured the formation of the middle class in China. It is interesting as the Chinese middle class is different from those in other Western countries due to the dramatic reorganization of social structure. Researchers have posited that, consumption, not income, is a more accurate term to measure the size of the middle class in this country (Chen & Qin, 2014).

As China became more integrated into the world and raised its spending power, more multinational corporations entered the country with products and services that contribute to the growth of advertising. Chang and Chan-Olmsted (2005) found economic openness (i.e. percentage of Foreign Direct Investment (FDI) in GDP), though not statistically significant, to be an important factor in differentiating GDP–ad spending associations. Kshetri and Alcantara (2016) pointed out that FDI positively predicts per capita ad spending, and it has bigger impacts (direct and indirect) in low-income countries such as China than in high-income countries. Similarly, some studies suggested that international trade is positively linked to advertising levels (Banks, 1986; DiPietro, 2009; Leff & Farley, 1980), and foreign entry significantly affects advertising intensity (e.g. the proportion of advertising expenditure in sales; Sun, 2014).

A higher degree of economic openness often results in an increase in the offering of foreign goods or services, and thus a growth in foreign investment in advertising in China. Most of FDI goes to the secondary and the tertiary industries, which are exactly the major service objects of advertising. In fact, the advertising industry in China not only has the highest level of foreign
penetration but also plays an instrumental role in shaping the Chinese media system and promoting transnational consumerism (Zhao, 2008, pp. 154-156, 185). Advertising from the multinational corporations opened the window to the world of capitalism for the Chinese consumers, affecting their purchase habits and consumption behaviors (Wang, 2000, p. 9). A healthy economic environment is an important factor for continuous economic prosperity. Particularly, compared with other industries, the media industry is under relatively higher regulation, political manipulation, and other controls. Therefore, media industry with a lower level of regulation or higher level of freedom would produce higher level of advertising media revenue. Economic freedom was found to be important in differentiating GDP–ad spending associations in a study across more than 70 nations over time (1991–2001; Chang & Chan-Olmsted, 2005). Accordingly, the following hypotheses on the relationships between advertising and various economic factors are posited:

\[ H1. \] The consumption level in China is positively associated with its advertising spending.

\[ H2. \] The industrialization level in China is positively associated with its advertising spending.

\[ H3. \] The economic openness in China is positively associated with its advertising spending.

\[ H4. \] The economic freedom in China is positively associated with its advertising spending.

**Advertising responsiveness to economy across time and media**

Conventional wisdom holds that firms would cut back on seemingly flexible expenditures such as R&D, marketing, and advertising when the economy goes down and would increase them when the economy goes up, which translates into a corresponding drop or increase in a country’s aggregate advertising spending (Frankenberger & Graham, 2003). Deleersnyder et al. (2009) support such a pro-cyclical advertising response, noting that managers would find it difficult to justify large advertising investments during economic declines because of the lower instantaneous return from advertising versus promotions. Moreover, the number of firms that advertise typically decreases during degenerating periods because of an increase in bankruptcies and reorganizations. On the other hand, managers are more likely to be able to “afford” a longer-term view when sales are expanding, and more new firms enter the market. Lamey, Deleersnyder, Dekimpe, and Steenkamp (2007) found advertising expenditures to exhibit a pro-cyclical behavior in all four media types (i.e. newspapers, radio, magazines, and TV). Contrary to the pro-cyclical view, advertising executives have repeatedly claimed that countercyclical, or at least inelastic, advertising may be more effective than pro-cyclical advertising (Frankenberger & Graham, 2003; Graham & Frankenberger, 2011; Srinivasan, Lilien, & Sridhar, 2011).

Many studies have discovered a high level of ad responsiveness to economy, ranging from 1.4 (average co-movement elasticity with GDP across 37 countries of the world), 1.91 (all media in the United States; Deleersnyder et al., 2009), 1.23 (total ad elasticity to sales in the United Kingdom), 1.40 (press ad elasticity to sales in the United Kingdom; Turner, 2000), 1.7 (all advertising’s elasticity with consumption in New Zealand; O’Donovan et al., 2000), to 2.074 (US long-run total advertising–GDP elasticity; Esteban-Bravo et al., 2015). Additional studies employed disaggregate ad data to calculate its relationship with economy. For example, Picard (2008) found the correlation between newspaper ad (retail, classified, national, and total) and GDP ranged from 0.30 to 0.99 in the United States during 1950–2005, and Roark and Stone (1994) found the highest
correlation between ads of Editor & Publisher and gross national product (GNP) was 0.249 in the United States from 1960 to 1992. Advertising is a relatively new marketing tool that has only resurfaced in China after 1978. As China’s economy became more market-oriented, more advertising executives are following the market instead of the planned economy dominated by state-owned enterprises, which is inelastic to the economy. With the typical ad-sales percentage budgeting method, and a culture that prefers thrift and prudence (Leung, 2008), it is plausible that its advertising would behave cyclically to economy. In a country that often values collectivism, the notion of “herding behavior” is likely to hold true also in advertising spending (i.e. the managers tend to imitate their competitors). Furthermore, the Confucian culture of being “better safe than sorry” means managers are more inclined to decrease advertising in difficult times and expand advertising when economy is good (Deleersnyder et al., 2009).

China only transitioned to a more market economy in 1992, when major economic restructuring programs were introduced (Harrold & Lall, 1993; Jaggi, Rundle, Rosen, & Takahashi, 1996). It is important to note that the cyclical nature would likely be affected by the degree of “market orientation” in China. As China’s economy became more market-oriented after 1992, more private enterprises and new products entered into the market. The press was regarded as part of tertiary sector to be promoted as a new point of economic growth by the end of 1992, and the government announced in 1992 that major newspapers to be financially independent by 1994 (Zhao, 2000). Commercial advertising was consequently accelerated to achieve media’s finance independence and further economic boom.

Extant studies show that different media respond to economic change differently. In general, print media such as newspaper and magazine are more responsive to economy than broadcast media such as TV and radio. Newspapers rely more on retail and classified advertising (Picard & Rimmer, 1999), and magazines mainly offer access to niche audience which is relatively flexible (Linnett & Friedman, 2002). Whereas, television is used by major companies to advertise more high-profile brands to large populations which is less recession-sensitive and more immune to economic changes (Van der Wurff et al., 2008). Picard (2001) found the effect of economic downturns on newspaper and magazine advertising to be four times that of effect on television advertising in nine developed countries (Germany, France, Italy, Japan, the United Kingdom, the United States, Finland, Sweden, and Spain). Other studies have confirmed similar conclusion (Bush, 2002; Deleersnyder et al., 2009; Didow & Franke, 1984; Picard, 2002; Yang, 1964).

The newspaper led the industrialization of media in China from the mid-1990s, and print media are more market-oriented compared with broadcast media in China. The first market-oriented medium after 1978 is West China Metropolis Daily, which was established in Chengdu in 1995. Founded in Guangzhou in 1996, the first media group, Guangzhou Daily Newspaper Group, started the trend of media commercialization and consolidation. The rise of nonparty commercial newspapers as the dominant media in China was accompanied by the drop in the readership of the party media in the state versus market tug of war during the 1990s. The growing demand for advertising in an increasingly market-oriented economy led to the rise of the newspaper industry as one of the most lucrative businesses in China around 2000 (Akhavan-Majid, 2004). More recently, during the slowdown of the Chinese economy, over 30 print media terminated their publishing in 2014 (Zhao, 2015). Similarly, Chinese magazines provide niche content that is responsive to different segments of audiences, reflecting a more market-driven nature. Television is typically the first choice of large companies that want to utilize the medium for brand building among a larger population, and television advertising is generally dominated by major players and is more stable. For example, the second largest medium in advertising revenues behind only to the Internet searching giant, Baidu,
is the *China Central Television Station* (CCTV), which took up about one-third of all national TV advertising. CCTV, a state-owned media firm, is ranked the 20th on the list of Top 30 Global Media Owners in 2015 (Barnard, 2015).

As a typical dual-market product, media firms both provide contents to audiences and access to advertisers (Picard, 1998). The two sides of media—markets of consumers and advertisers are closely interconnected. Typically, media advertising compensates the financial loss in the consumers’ market. Media that supply inexpensive or even free content to audiences, such as newspaper, radio, and television, depend almost exclusively on advertising revenues (Kalita & Ducoffe, 1995). In such a dual market, audiences are the foundation of advertising. The more high-quality audiences one medium has, the more advertising it can derive from the market. Meanwhile, more advertising can lead to better content product because of increased access to resources. The interdependence between media supply and advertising is evident in industrialized China. Studies have found that the demand for advertising space increases as newspaper circulation increases, and the advertising volume a newspaper carries influences its subscription level (Depken & Wilson, 2004; Mantrala, Naik, Sridhar, & Thorson, 2007). Accordingly, the following hypotheses are proposed:

\[ H_5 \]. The elasticity of advertising to economy would be greater after China transitioned to a market economy in 1992.

\[ H_6 \]. The relationship between print advertising and economy is stronger than the relationship between broadcast advertising and economy.

\[ H_7 \]. The product supply of print media has a stronger relationship with economy than that of broadcast media.

**Methods**

**Data collection**

Secondary economic and advertising data of China from 1979 to 2014 were collected from various sources to test the hypotheses. Specifically, data on economy such as GDP, household consumption, industrialization level, and FDI were garnered from the online World Development Indicators (WDI) database of the World Bank. Economic freedom index was collected from the website of Fraser Institute’s Economic Freedom of World Project. Advertising spending data, including overall and specific media platforms, were derived from the annual *China Advertising Yearbook* published by *Xinhua Press* (China Association of Advertising, 2015). As for media product supply data, they were collected from the website of National Statistics Bureau of China (NSBC; see sources of data in Appendix 1).

**Measures**

Advertising spending in the study is measured by the annual overall advertising revenues (including advertising of newspaper, magazine, TV, radio, and advertising agencies) and revenues by medium (e.g. newspaper, magazine, TV, or radio). Household consumption is the household final consumption expenditure (formerly private consumption), which is the market value of all goods and services, including durable products purchased by households, while industrialization level was represented by the percentage of manufacturing and service industries in GDP. The percentage
of FDI in GDP is used as the indicator of economic openness. Next, economic freedom is measured using the annual Economic Freedom of the World index reported by the Fraser Institute which takes into account factors such as tax rate, government subsidies, legal system and property rights, inflation, tariffs, trade barriers, and credit market/labor marketing/business regulations. Finally, the degree of product supply for broadcast media is measured by the annual total TV program production hours and radio program production hours, while the supply of print media was measured by the number of total annual newspaper copies distributed and the total annual number of magazine copies distributed, as reported by NSBC.

**Analysis and results**

**Stationarity**

The graphical inspection reveals that the data series may be nonstationary (Figure 2); therefore, it is critical to test unit roots to avoid spurious regressions (Engle & Granger, 1987).

This study employs the well-known Augmented Dickey-Fuller (ADF) test to investigate the order of integration of the series for both original and first-differenced data. To validate the test results, the less well-known (confirmatory) Kwiatkowski-Phillips-Schmidt-Shin (KPSS) stationary (no unit root) test is conducted. Note that ADF test uses null hypothesis that a series contains a unit root (no stationary), while KPSS test uses null hypothesis that the series is stationary; therefore, the significant results of ADF tests indicate the stationarity while the significant results of KPSS test indicate the non-stationarity. The results of unit root tests reported in Table 1 yield the same general conclusion, that is, the variables are nonstationary in original level form but stationary in first difference; therefore, all the data series are said to be difference stationary (e.g. to follow \( I(1) \) process).
As all variables are integrated of order one, $I(1)$, it is necessary to determine whether there is a stable and non-spurious (cointegrated) relationship among the regressors in each of the relevant specifications. The Johansen Test is employed to determine the number of cointegrating vectors for any given number of nonstationary series (of the same order; Johansen & Juselius, 1990). Information criteria are the initial measures that can be adopted when selecting the appropriate lags in a time series model. The results show that one unique cointegrating vector should be chosen because it is the last significant estimate before the null of no cointegration cannot be rejected ($44.492 < 47.210$, denoted by * for trace statistics in Table 2).

### Vector Error Correction Model

As there exists a unique linear combination of the $I(1)$ variables that links them in a stable and long-run relationship, the Vector Error Correction Model (VECM) allowing for 1 lag of order is selected. That is to say, 1 lag of dependent variable (e.g. $lnp_{ad,t-1}$) was treated as an independent variable (Johansen, 1995). Before VECM estimation, the lag order is determined by vector autoregression (VAR) representation. Based on the Bayesian Information Criterion (BIC) and the above literature, the lag of 1 is selected in this study (Table 3).

The VECM framework allows investigators to model the short-run correction mechanism of a system of variables to their long-run equilibrium without deciding, a priori, about the endogeneity or exogeneity of the included variables. The vector autoregressive framework treats all variables as endogenous and determines the direction of causality between them based on econometric tests instead of assuming exogeneity based on economic theory. There are advantages in this article without predetermining the direction of causality here. First, there has been no consensus in the literature about the direction of causality between the advertising and macro economy (e.g. GDP or consumption). Second, China is a developing country with a significant structural and institutional change and opened itself to the West in a very short period of time. This could cause any predictions from economic theory about the behavior of some key macro variables to deviate significantly from their actual trajectory. VECM specifications can only be estimated if there is a cointegrating relationship among the variables which is the right case for this study (Ramirez & Kőműves, 2014).

| Variables                      | Original level data | First-difference |
|-------------------------------|---------------------|------------------|
|                               | ADF                 | KPSS             | ADF               | KPSS             |
| Natural log of per capita ad  | $-4.034^{***}$     | $0.376^{***}$    | $-4.946^{***}$    | $0.111$          |
| Natural log of per capita consumption | $1.552$           | $0.283^{***}$    | $-4.686^{***}$    | $0.0497$         |
| Industrilization              | $-0.237$           | $0.210^{***}$    | $-5.752^{***}$    | $0.145^*$        |
| Economic openness             | $-1.916$           | $0.300^{***}$    | $-4.438^{***}$    | $0.0419$         |
| Economic freedom              | $-2.217$           | $0.124^*$        | $-3.250^{**}$     | $0.0903$         |

The lag order for KPSS test is 1.

*p < 0.01; **p < 0.05; and ***p < 0.01.
For a given lag $p$, the LR test compares a VAR with $p$ lags with one with $(p-1)$ lags. The null hypothesis is that all the coefficients on the $p$th lags of the endogenous variables are zero.

Based on the theoretical principles and the experience in China discussed above, this article treats the advertising as a function of consumption, industrialization, economic openness, and economic freedom.

$$\begin{align*}
\text{Advertising} &= f(\text{Consumption, Industrialization, Openness, Freedom})
\end{align*}$$

The long-term relationship for the advertising model can be expressed in logarithmic per capita form.

$$\ln \text{perad} = \alpha + \beta_1 \ln \text{perconsumption} + \beta_2 \text{openness} + \beta_3 \text{industrialization} + \beta_4 \text{freedom} + \epsilon \quad (1)$$

where perad is the per capita advertising, perconsumption is the per capita household consumption, openness is the percentage of FDI in GDP, industrialization is the percentage of manufacturing and service in GDP, and freedom is the Fraser economic freedom index. The maximum likelihood estimation (MLE) method for VECM by Johansen (1991) is employed, and lag of 1 and rank of 1 are selected.

As this article mainly addresses the long-run equilibrium of the above cointegrating relationship, the cointegrating equation based on VECM can be written as

$$\ln \text{perad} = -18.208 + 2.590^{**} \ln \text{perconsumption} + 0.728^{**} \text{openness} - 0.133 \text{industrialization} + 1.567^{**} \text{freedom}$$
The lag range-multiplier test (of no autocorrelation) is conducted and no autocorrelation is detected for the VECM error term ($\chi^2_{df=25} = 28.509, p = 0.285$). If the process is stable, the moduli of the remaining $r$ eigenvalues are strictly less than 1, and the current VECM estimates are stable (Figure 3). Therefore, $H_1$, $H_3$, and $H_4$ are supported, but $H_2$ does not get support.

Granger Causality Test is used here to inspect the effect direction within two variables that may interact with each other. At the significance level of 0.05, the null hypothesis that per capita consumption does not Granger-cause per capita advertising was rejected, meaning that per capita consumption was the Granger-cause of per capita advertising but not the other way around. Furthermore, while the tests show that industrialization and advertising spending have mutual influence, neither economic freedom nor openness have any causal influence on per capita advertising and vice versa (see Table 4). It seems that the ad–economy relationship is mainly bidirectional or from economy to advertising, as no single causal relationship from advertising to economic conditions was detected. In sum, $H_1$ and $H_3$ receive additional support.

**Cross-media and cross-time differences**

The results of log-log equation between advertising and GDP/consumption during whole period (1981–2014) shows 1-unit change (approximation of the first-differenced natural logarithm) from GDP’s growth translated into a corresponding 2.36-unit change of advertising spending (elasticity = 2.36, $p < 0.01$), and 1-unit change of household consumption is accompanied by 2.13-unit change in advertising (elasticity = 2.13, $p < 0.01$).

When China’s economy stepped further into market, the responses of advertising to economy fluctuated across media and across time (before and after 1992). The results show that compared
with the earlier period, the elasticity of advertising to economy after 1992 is greater. Specially, the advertising–GDP co-movement elasticity was 2.13 \((p<0.10)\) for 1981–1991 and 2.89 \((p<0.10)\) for 1992–2014; advertising–consumption elasticity was 2.01 \((p<0.05)\) for 1981–1991 and 3.43 \((p<0.05)\) for 1992–2014. To test the different responses of economy to advertising during the structural break, dummy variable is created with the equation

\[
\ln \ln ad = \alpha + \beta_1 \ln economy + \beta_2 \text{dummy} \times \ln economy + \beta_3 \text{dummy} + \varepsilon
\]

where \(ad\) represents total advertising or advertising on each medium, \(economy\) represents GDP or household consumption, and \(\text{dummy}\) equals 1 for the period after 1992 (1992–2014, otherwise, \(\text{dummy} = 0\)). Equation (2) is used to test the differences of elasticities between the two periods and whether \(\beta_2\) and \(\beta_3\) are jointly statistically different from zero by Chow Test. The Chow Test assumes the homoscedasticity and no autocorrelation, and subsequently white test for homoscedasticity and Brusch-Godfrey LM test for autocorrelation are conducted. The homoscedasticity hypothesis is rejected \((\chi^2_{df=2} = 4.90, p<0.10)\), and hypothesis of no autocorrelation is also rejected \((\chi^2_{df=1} = 16.40, p<0.01)\) for ad-consumption equation. That is to say, the error term of regression of \(\ln ad\) on \(\ln consumption\) has both heteroscedasticity \((p<0.10)\) and autocorrelation \((p<0.01)\). Similarly, the error term of regression of \(\ln ad\) on \(\ln GDP\) has both heteroscedasticity \((p<0.10)\) and autocorrelation \((p<0.01)\). Therefore, Newey-West estimation with heteroscedasticity and autocorrelation consistent (HAC) standard error is conducted in equation (2) instead (Newey & West, 1987). The structural breaks are significant for both ad-consumption \((F(2,32) = 31.23, p<0.01)\) and ad–GDP \((F(2,33) = 28.36, p<0.01)\) relationships, indicating \(\beta_2\) and \(\beta_3\) were statistically different from zero in both models. The test results demonstrate that the differences are significant; therefore, H5 is supported.

The responsiveness of advertising expenditures among media reflects how closely advertising expenditures follow the fluctuation of economy. The standardized regression coefficient (Beta) between annual growth rates (approximation of the first-differenced natural logarithm) for advertising and household consumption (or GDP) indicates how closely advertising follows the economic changes in China. The results show that the Beta for print advertising growth is greater than that of broadcast advertising, and the Beta for newspaper advertising growth is greater than that of TV (see the left half of Table 5). But t-test shows that the advertising responses to household

| Null hypotheses                                                                 | F        |
|---------------------------------------------------------------------------------|----------|
| Natural log of per capita consumption does not Granger-cause natural log of per capita advertising. | 4.13**   |
| Natural log of per capita advertising does not Granger-cause per capita GDP.     | 0.11     |
| Degree of economic openness does not Granger-cause natural log of per capita advertising. | 0.18     |
| Natural log of per capita advertising does not Granger-cause degree of economic openness. | 0.10     |
| Industrialization does not Granger-cause natural log of per capita advertising. | 6.62**   |
| Natural log of per capita advertising does not Granger-cause industrialization.  | 6.81**   |
| Economic freedom does not Granger-cause natural log of per capita advertising.   | 0.50     |
| Natural log of per capita advertising does not Granger-cause economic freedom.   | 0.82     |

The lag in the test is 1. **\(p<0.05\).
consumption (or GDP) between print and broadcast media are not statistically different, and the advertising responses to household consumption (or GDP) between TV and newspaper are not statistically different either. So, H6 is not fully supported.

As for H7, note that to keep the results comparable, the media supply data for newspaper and magazine only included those from 1982 to 2014 because the data on program hours are only available for the period from 1982 to 2014 (the numbers in the parentheses are the elasticities from 1979 to 2014 for print media, the right half of Table 5). The results show that TV and radio programs production does not follow the household consumption, but their responsiveness to GDP is closer than that of print media. The seemingly unrelated regression (SUR) Test shows that the supply responses to household consumption (or GDP) between print (circulation) and broadcast (program production) are not statistically different ($\chi^2 = 0.98, p = 0.32$), and the supply responses to household consumption (or GDP) between TV (program production) and newspaper (circulation) are not statistically significant either. Therefore, H7 is not supported.

### Discussion and conclusion

As a peculiar combination of market economy and party-state controlled political system, China presents an interesting advertising environment. This study explored the dynamics between China’s advertising and economy and discovered the significant connection between the two, as well as their relative relationship.

Specifically, both VECM procedure and Granger test found household consumption to positively predict advertising spending in China, and not the other way around, confirming the deterministic perspective of advertising in this country. The VECM analysis reveals the elasticity of per capita consumption to per capita advertising is 2.590, which is consistent with the finding that advertising magnifies the growth of macro economy (Deleersnyder et al., 2009; Esteban-Bravo et al., 2015; O’Donovan et al., 2000; Turner, 2000). As China’s economy is shifting from investment and export, which rely less on advertising, to consumerism (Reuters, 2015), the interrelationship between advertising and economy is expected to be even more intensified. The pro-cyclical finding might be explained by a number of economic and cultural factors. First, the result of the unprecedented active market economy induced the entry of a large number of new enterprises that needed advertising at the beginning of the product cycle to jumpstart their businesses. Next, the

| Media      | Advertising Beta (consumption) | Advertising Beta (GDP) | Supply Beta (consumption) | Supply Beta (GDP) |
|------------|-------------------------------|------------------------|--------------------------|------------------|
| Print      | 0.50***                       | 0.57***                | 0.54*** (0.56***         | 0.37** (0.39**)  |
| Broadcast  | 0.37**                        | 0.40**                 | 0.22                     |                  |
| Newspaper  | 0.48***                       | 0.59***                | 0.53*** (0.53***         | 0.35** (0.36***  |
| TV         | 0.43**                        | 0.43**                 | 0.17                     | 0.38**           |
| Radio      | 0.079                         | 0.52**                 | 0.23                     | 0.55***          |
| Magazine   | 0.34*                         | 0.44**                 | 0.24 (0.62***            | 0.16 (0.55***    |

The numbers in the parentheses are the elasticities from 1979 to 2014 for print media.

*p < 0.10; **p < 0.05; and ***p < 0.01.
Chinese nature to save for the future, being prudent and thrift, and avoid face-losing failures might lead to a more limited advertising budget during economic difficulties (Cardon, 2009; Leung, 2008). Finally, the Chinese advertising companies seldom used sophisticated budgeting methods, and the most common method of advertising budgeting used in China was “judgmental” (Prendergast, West, & Shi, 2006). Nevertheless, the larger elasticity difference after 1992 suggests that, as China’s economy became more market-oriented and its advertising industry grew more mature, the managers also became more sensitive to economic changes.

The cointegration equation in VECM does not find significant impacts of industrialization, but Granger tests indicate that industrialization and advertising promote each other mutually, and industrialization is the only economic variable having reciprocal influence with advertising. Industrialization represents the relative composition of manufacturing and service (excluding agriculture), which heavily relies on advertising for promotion. For example, the Top 10 categories of advertising in 2014, all in manufacturing and service, made up 69.09% of China’s total advertising revenues (China Association of Advertising, 2015). The bidirectional relationship between industrialization and advertising has significant implications on the topic of urbanization in China because most manufacturing and service industries are clustered in the cities. For example, Top 2 big cities, Beijing and Shanghai, collectively generated 42.56% of the national advertising in 2014 (China Association of Advertising, 2015). It is plausible that advertising spending has further growth potential as China becomes more industrialized and urbanized into the future. On the other hand, observers have noted the risk of “manufacturing hollowing out” and “technology upgrade trap” during China’s transition toward a new stage of decelerating economic growth during increasingly sophisticated industrialization (Huang, 2015). Only fundamentally sound industrialization and urbanization would further stimulate advertising development through appropriate economic upgrading and transformation. The lack of significant impacts of industrialization on advertising in VECM may be the significant impact from consumption, which dwarfs the similar impacts from the secondary/tertiary economic sectors.

Although the cointegration result confirms the positive impact of economic openness on advertising, no causality between them is detected through the Granger test. It would be fruitful to continue to monitor the nature of this relationship as China’s economy becomes more integrated into world and the FDI continues to grow. Note that while the foreign-invested advertising companies only made up 8.82% of total Chinese advertising in 2013, three of the Top 5 biggest advertising companies are foreign-invested (China Advertising Association, 2014). Although the economic openness has a significant impact on advertising, on the other side, advertising is hard to promote the overall openness in economy. The results of VECM reveal significant impacts of economic freedom on per capita advertising, indicating that governmental policies (e.g. tax rate, government subsidies, and regulations) would play positive roles in advertising prosperity.

The results on the relationship between different media and economy reveal more peculiar insights into the China model. Several factors might explain the findings that newspaper advertising follows more closely with the economy than TV advertising and address the differences from the perspective of product supply between the two. First, newspaper advertising is relatively inexpensive in China compared with TV advertising. The localized nature makes newspapers ad spending more responsive to local economies, particularly in dynamic regional economic clusters. On the other hand, TV advertising is more centralized and expensive and used more frequently for brand building, especially for less recession-sensitive ads (Van der Wurff et al., 2008). In sum, there seems to be an asymmetry in the role of the government in terms of media advertising versus media product supply, and newspaper versus television. Specifically, staying true to its market-authoritarianism...
model, the Chinese government has been quick to support the production and supply of media, which serve as an important tool for disseminating state agenda. In a sense, while the media supply is more reflective of the government’s political needs, media operations are supported with a market orientation. As Wu (2000) indicated in his metaphor of the China press system, “one head, many mouths,” which means the community party-state (head) still exercise tight control over the many party and nonparty newspapers published in today’s China, the abundant “mouths” have to be fed by an active advertising market. There are some practical implications for the cross-media differences on the magnitudes of advertising–economy relationship. Since the Chinese newspapers are relatively more sensitive to economic fluctuations—as China transitions into a more consumption-oriented economy and faces a slowdown in growth—the newspaper industry is likely to be hit disproportionally hard and needs a transformational move to digitalization.

There are some limitations associated with this study. First, it does not fully capture the impact of government regulations. In China, the advertising industry is regulated by a confusing array of official entities (Gao, 2007). There are problems of unclear autonomy of legal regimes, indeterminacy in interpretation, and thus low predictability. In addition, the government frequently changed the categories used in collecting statistics (Wu, 2000), making the inclusion of policy factors difficult to examine. Second, this article does not address the Internet advertising for the lack of data. With the growth of digital media advertising, inclusion of online and mobile advertising would offer new insight for the advertising–economy relationship in China.

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### Appendix 1. Sources of data.

| Variable       | Description                                      | Available           | Sources                                      |
|----------------|--------------------------------------------------|---------------------|----------------------------------------------|
| **Dependent variable** | **Advertising**                                |                     |                                              |
|                | Total ad                                         | 1979–2014           | China Advertising Association (CAA)          |
|                | Newspaper ad                                     | 1983, 1985,         |                                              |
|                | Magazine ad                                       | 1987–2014           |                                              |
|                | TV ad                                             |                     |                                              |
|                | Radio ad                                          |                     |                                              |
| **Economic variables** | **GDP**                                        | 1978–2014           | World Development Indicator (WDI)            |
|                | Annual gross domestic product                     |                     |                                              |
| **Population** | Midyear estimates on total population            | 1978–2014           | WDI                                          |
| **CPI**        | Consumer price index based on 1978 (100)         | 1978–2014           | WDI                                          |
| **Openness**   | Percentage of Foreign Direct Investment in GDP   | 1982–2014           | WDI                                          |
| **Industrialization** | Percentage of industry and service in GDP       | 1978–2014           | WDI                                          |
| **Consumption**| Total annual national HH consumption             | 1978–2014           | WDI                                          |
| **Freedom**    | Economic freedom                                 | 1980, 1985, 1990, 1995, 2000–2013 | Fraser Institute |
| **Media supply**| **TV**                                           | 1982–2014           | The National Bureau of Statistics of China (NBSC) |
|                | Total hours of annual TV program production       |                     |                                              |
| **Radio**      | Total hours of annual radio program production    |                     |                                              |
| **Newspaper**  | Total annual newspaper copies distributed        | 1979–2014           |                                              |
| **Magazine**   | Total annual magazine copies distributed         | 1979–2014           |                                              |