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Structure, conduct and performance: a simultaneous equations approach

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A simultaneous equations framework is used to study the relationship between structure, conduct and performance in US manufacturing in the 1980s and 1990s. The paper expands on earlier structure–conduct–performance studies by using a lag structure to signify that structure, conduct and performance do not affect one another contemporaneously. Findings support some aspects of the traditional structure–conduct–performance model, but challenge others. First, the data suggest that industry structure does not depend on current industry performance. Second, little evidence is found that industry conduct, proxied by advertising, is affected by industry structure. Third, results show that industry performance does not depend on industry conduct, though it is sensitive to industry structure. The main findings are that (1) concentration does not depend on firm profitability, though profitability depends on concentration, (2) advertising follows a process that is independent of the factors considered here, and (3) advertising seems to have no effect on profitability.

I. INTRODUCTION

Since the 1940s, industrial economists have used structure–conduct–performance studies to analyse industries and markets. Traditionally, analysts assumed a one-way causal relationship between market structure and market performance via market conduct. Market structure was treated as exogenous, as determined by basic market conditions such as technology and demand. More recent studies, however, recognize a feedback effect in which performance affects both conduct and structure, and conduct in turn affects structure. These studies indicate that structure is influenced by conduct and performance, thereby creating simultaneity bias in ordinary least squares (OLS) estimates of the effects of market structure on performance. A simultaneous equations model, however, can produce consistent and unbiased estimates when these feedback effects exist.

A simultaneous equations framework is used to study the relationship between structure, conduct, and performance in US manufacturing in 1982, 1987 and 1992. The model includes three equations, one each for structure (S), conduct (C) and performance (P), as a function of the other two variables: $S = f(C, P), C = f(S, P)$, and $P = f(S, C)$. Following convention, the Herfindahl–Hirschman index (HHI) is used as the dependent variable for structure, advertising as the dependent variable for conduct, and operating profit as the dependent variable for performance. Unlike traditional studies, however, we follow Kambhampati (1996) and assume that each variable influences the others not contemporaneously, but over time. Consequently, a particular lag structure is implemented to identify more precisely the relationship between the three variables.

Present findings support some aspects of the traditional structure–conduct–performance (SCP) paradigm, but challenge others. First, the data suggest that industry structure does not depend on current industry performance. Specifically, the average profitability of an industry does not have a statistically significant effect on the industry's HHI, controlling for past profitability, past advertising and past R&D. In regressions of concentration on profitability,

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the only right-hand-side variable with a statistically significant coefficient is lagged R&D. The coefficient is positive, consistent with the view that highly innovative industries tend to become more concentrated as they mature. Importantly, lagged advertising is not significant, casting doubt on the view, associated with Robinson (1933), Kaldor (1950), Bain (1956) and Comanor and Wilson (1974), among others, that advertising reduces consumer welfare and increases profits by creating spurious product differentiation and barriers to entry.[1]

Second, little evidence is found that industry conduct, proxied by advertising, is affected by industry structure. Concentration generally does not have a statistically significant effect on advertising, controlling for past profitability and industry growth. Moreover, advertising does not seem to depend on past profitability, suggesting that advertising is best regarded as a forward-looking, strategic variable. The first two results are interpreted as consistent with the view, associated with Stigler (1961), Telser (1964), Nelson (1974) and Demsetz (1979), that advertising performs a useful social function by giving consumers information about price, product quality and availability. Of course, interpreting advertising as a forward-looking variable does not rule out the possibility that it is designed to create *future* entry barriers. However, the finding that concentration does not depend on past advertising casts doubt on such a predatory view of advertising.

Third, it is found that industry performance does not appear to depend on industry conduct, though it is sensitive to industry structure. Specifically, advertising does not have a statistically significant effect on current profitability, controlling for industry growth, R&D and investment. In two of the three sample periods, concentration does have a statistically significant (and positive) effect on profits. Interestingly, current R&D usually has a negative and statistically significant effect on profitability. This is not surprising, however, as current accounting practices allow firms to express R&D entirely in the year incurred instead of amortizing it to recognize its future benefits.

Section II discusses structure, conduct, and performance in further detail and reviews previous approaches to this problem. Section III outlines the model and data. Section IV presents empirical results. Section V addresses potential problems in both the data and estimation process. Finally, Section VI offers concluding remarks.

II. STRUCTURE, CONDUCT AND PERFORMANCE

In the traditional SCP view, market organization (structure) – in particular, sellers' concentration – affects market performance through various channels. Besides sellers' concentration, market structure includes product differentiation, barriers to entry, buyers' concentration, fixed costs and barriers to exit, and the growth rate of market demand. Market conduct includes firms' policies that affect customers, rivals and suppliers, including price, product characteristics and other terms that influence market transactions. By creating high entry barriers or by attempting to drive out existing firms, for example, firms can attempt to alter the structure of the market.

Analysing market performance involves a normative evaluation of the results from a market's conduct. Caves (1987), for instance, analyses market performance by four criteria: (1) efforts to maximize consumer welfare by producing goods at lower cost; (2) improvements in the quality and diversity of goods and technology; (3) stability in prices and employment; and (4) producing an equitable distribution of goods among consumers of different needs. In doing so he attempts to identify potential discrepancies between actual and potential performance and to suggest ways to eliminate these discrepancies.

Bain (1951), Gupta (1983), Schmalensee (1989), Weiss (1994) and Baker and Woodward (1998), among others, have proposed a variety of econometric approaches for empirically evaluating the SCP paradigm. Here Kambhampati's (1996) simultaneous equations approach is followed. She uses a version of the standard three-equation model but includes a lag structure in the equations, rejecting the belief that each variable influences the other variables contemporaneously. She argues that lagged conduct and both lagged and current performance affect structure. Structure is influenced by the actions of both incumbents and potential entrants. Incumbents can influence structure more quickly than potential entrants, who are in the process of raising capital to finance their decision to enter and produce. Conduct is lagged as well, as past behaviour can represent an entry barrier. Thus, $S_t = f(C_{t-1}, \bar{P}_{t-3})$ where S_t represents current structure, C_{t-1} is lagged conduct, and P_{t-3} is profits averaged over the current and past three years. The conduct equation becomes $C_t = f(S_t, \bar{P}_{t-1})$ as last year's profits can affect the firm's current behaviour. Finally, the performance equation remains as $P_t = f(S_t, C_t)$. She specifies the concentration ratio as the structure dependent variable, advertising as the conduct dependent variable and profit margin as the performance dependent variable. She uses two-stage least squares (2SLS) to construct coefficient estimates for each of the exogenous and endogenous variables.

III. MODEL AND DATA

Kambhampati's lagged-dependent-variable approach is used in a simultaneous equations model to analyse struc-

[1] Greuner *et al.* (2000) find similarly that advertising does not appear to increase profitability in the US auto industry. For similar findings in other industries see Imel and Helmberger (1971), Grabowski and Mueller (1978), Porter (1979) and Nagle (1981).

ture, conduct, and performance in manufacturing in 1982, 1987 and 1992. Thus, this analysis involves three separate cross-sections with some lagged variables within each separate period. Unfortunately, the sample is limited by the availability of sellers' concentration data for 1982, 1987 and 1992, as well as COMPUSTAT data for each SIC code. Samples for each of the three years were, in fact, narrowed after sellers' concentration data were matched with the COMPUSTAT files and those observations with missing data discarded. First, four-firm concentration ratios (CR) and Herfindahl–Hirschman (HHI) indexes were retrieved from the *1982*, *1987* and *1992 Census of Manufactures*. These data are provided for about 450 industries, defined at the four-digit SIC level. Table 1 lists the ten most heavily concentrated industries, measured by HHI, for 1982, 1987 and 1992. As the table shows, there is little variation in the rankings between the two years, with photographic equipment, motor vehicle parts, aircraft parts, tyres, and medicinals appearing near the top of all three lists.

Table 1. *Most heavily concentrated industries, 1982, 1987 and 1992*

HHI	SIC	Industry
1982		
2157	3861	Photographic equipment and supplies
1817	3714	Motor vehicle parts and accessories
1778	3724	Aircraft engines and engine parts
1591	3011	Tyres and inner tubes
1470	2833	Medicinals and botanicals
1468	3523	Farm machinery and equipment
1358	3721	Aircraft
1188	3716	Motor homes
1000	3822	Environmental controls
975	3851	Ophthalmic goods
1987		
2588	2833	Medicinals and botanicals
2241	3861	Photographic equipment and supplies
2201	3724	Aircraft engines and engine parts
2126	3221	Glass containers
1897	3011	Tyres and inner tubes
1686	3721	Aircraft
1558	3714	Motor vehicle parts and accessories
1278	2052	Cookies and crackers
1076	3411	Metal cans
1011	3678	Electronic connectors
1992		
2717	3721	Aircraft
2676	3711	Motor vehicles and car bodies
2408	3861	Photographic equipment and supplies
2378	3724	Aircraft engines and engine parts
2162	3221	Glass containers
1743	3011	Tyres and inner tubes
1607	3844	X-ray apparatus and tubes
1456	3334	Primary aluminium
1419	3751	Motorcycles, bicycles, and parts
1260	3578	Calculating and accounting equipment

Industry performance data were aggregated up from Standard and Poor's COMPUSTAT tapes. COMPUSTAT was searched for all US firms from 1979 to 1992 matching the four-digit industries for which concentration data were available. (Data going back to 1979 were needed to construct all the lagged dependent variables.) Firms were found in 85 of the industries gathered from the *Census of Manufactures*. Of those 85 industries, any industry with fewer than three firms listed on COMPUSTAT was dropped from consideration. This left 57 four-digit industries for 1982, 61 for 1987 and 74 for 1992. Annual balance-sheet data on the firms in those industries were retrieved and industry averages constructed for sales, assets, income, advertising and R&D intensity, both contemporaneous and lagged. This left final samples of 57, 61 and 74 four-digit industries for 1982, 1987 and 1992, respectively, with data on concentration, profitability, advertising and other contemporaneous and lagged variables to use as instruments.

Table 2 provides descriptive statistics on the variables. Concentration is measured by the Herfindahl index (HHI).[2] Profit is measured by operating return on sales, defined as operating income divided by net sales.[3] Advertising is also divided by net sales, as is R&D.[4] Lagged growth is the ratio of net sales lagged one year and net sales lagged two years. Investment is defined as net capital expenditures divided by total assets.

Two-stage least squares was used to estimate the simultaneous equations model with the included lag structure. Kambhampati's (1996) three-equation model was followed, but with limited data. The endogenous variables in the model are advertising, concentration and profit. The exogenous variables are R&D, lagged R&D, lagged growth, investment, lagged advertising and lagged profit. Lagged values of advertising and profit enable these variables to enter as exogenous, rather than endogenous, variables. The structure equation is $S_t = f(C_{t-1}, P_{t-1})$, with concentration assumed to be a function of lagged advertising and lagged profit. R&D was lagged as it can act as a potential barrier to entry. The conduct equation assumes $C_t = f(S_t, P_{t-1})$, using advertising as the dependent variable and concentration, lagged growth and lagged profit as independent variables. Finally, the performance equation incorporates all

[2] All empirical results were repeated using four-firm concentration ratios. Only the results with the HHI are reported here.
[3] Other profit measures were tried, such as return on investment (net income divided by total assets) and return on equity (common equity divided by income available for common). The results were qualitatively similar to, though weaker than, those reported here.
[4] Blonigen and Taylor (1999), following Hall (1988), measure R&D intensity as the ratio of R&D expenditures to total assets. Both the asset-weighted and sales-weighted R&D intensity measures were used, and nearly identical results found. Only the results with the sales-weighted measure are reported here.

Table 2. *Descriptive statistics*

Variable	Mean	Standard deviation	Minimum	Maximum
1982 ($N = 59$)				
Concentration	587.8135	488.2574	66.0000	2157.00
Advertising	0.0157	0.0275	0	0.1576
Lagged advertising	0.0142	0.0227	0	0.1042
R&D	0.0277	0.1068	0	0.8211
Lagged R&D	0.0269	0.1142	0	0.8800
Investment	0.0724	0.0292	0.0170	0.1640
Sales	712.3604	808.7580	11.6200	3830.90
Profit	0.0711	0.1562	−1.0000	0.2390
Lagged profit	0.1057	0.0473	−0.0200	0.2370
Lagged growth	1.1281	0.1624	0.9402	1.7570
1987 ($N = 62$)				
Concentration	627.9032	586.0754	68.0000	2588.00
Advertising	0.0180	0.0303	0	0.1626
Lagged advertising	0.0184	0.0288	0	0.1572
R&D	0.0196	0.0444	0	0.2960
Lagged R&D	0.0201	0.0389	0	0.2417
Investment	0.0646	0.0243	0.0150	0.1560
Sales	1096.11	1504.57	18.7400	8487.10
Profit	0.0944	0.0819	−0.4200	0.2020
Lagged profit	0.0890	0.0863	−0.4900	0.1990
Lagged growth	1.0700	0.2285	0.1037	1.7323
1992 ($N = 74$)				
Concentration	661.5467	589.8311	15.0000	2717.00
Advertising	0.0188	0.0288	0	0.1634
Lagged advertising	0.0188	0.0283	0	0.1549
R&D	0.0620	0.1616	0	1.2137
Lagged R&D	0.0547	0.1184	0	0.8883
Investment	0.0590	0.0245	0.0161	0.1190
Sales	2392.69	5602.10	43.3380	43412.40
Profit	0.0925	0.0439	−0.0761	0.1860
Lagged profit	0.0904	0.0496	−0.1741	0.1986
Lagged growth	1.0679	0.3703	0.7396	4.1790

Concentration is defined as the Herfindahl-Hirschman index, gathered from the *1982*, *1987* and *1992 Census of Manufactures*. All other data are from COMPUSTAT. Profit is measured by operating return on sales, defined as operating income divided by net sales. Advertising and R&D are also divided by net sales. Lagged growth is the ratio of net sales lagged one year and net sales lagged two years. Investment is defined as net capital expenditures divided by total assets.

of the previous variables plus investment, giving $P_t = f(S_t, C_t)$ with profit as the dependent variable and advertising, concentration, lagged growth and investment as independent variables.

In the structure equation, the signs on lagged values of advertising, profit and R&D cannot be predicted. However, in the conduct and performance equations one has more insight into the predicted signs. According to the SCP paradigm, concentration and lagged profit should be positive and significant in the conduct equation. With high concentration and past profits, firms should advertise more. Kambhampati argues that lagged growth in sales should be negative. However, we feel that lagged growth should be positive, as there should be an increase in advertising to combat increased competition among the incumbents in the market to capture this increased demand. In the third equation, advertising, R&D, investment, concentration and lagged growth should all be positively related to the profit margin. Most important, if current profits depend on current market structure, then the sign on concentration should be positive.

IV. EMPIRICAL ESTIMATION AND RESULTS

The proposed model can be estimated as a system of three linear equations. Adding error terms, the equations to be estimated are

Table 3. *Two-stage least squares estimates*

	Concentration			*Advertising*			*Profit*		
Dependent variable	1982	1987	1992	1982	1987	1992	1982	1987	1992
Intercept	570.453[a]	653.785[a]	1153.171[b]	0.033	−0.014	0.220	−0.518[c]	0.114	0.367
	(3.325)	(2.857)	(2.378)	(0.897)	(−0.581)	(1.165)	(−1.676)	(0.809)	(0.939)
Lagged advertising	−2424.601	−8366.610	−1245.872						
	(−0.850)	(−1.640)	(−0.451)						
Lagged R&D	2034.281[b]	7382.920[a]	−146.762						
	(2.026)	(2.992)	(−0.180)						
Lagged profit	13.508	13504.000	1749.730	−0.032	0.052	−0.193			
	(0.010)	(1.666)	(0.470)	(−0.339)	(1.138)	(−0.473)			
Lagged growth				0.012	0.034	−0.026	0.087	−0.138	−0.036
				(0.335)	(1.337)	(−0.537)	(0.422)	(−0.963)	(−0.405)
R&D							−1.713[a]	−1.585[c]	0.037
							(−5.331)	(−1.720)	(0.171)
Investment							3.101[c]	−0.133	0.016
							(1.966)	(−0.123)	(0.015)
Concentration				−0.000[c]	−0.000	−0.000	0.000[b]	−0.000[c]	−0.000
				(−1.96)	(−0.981)	(−1.161)	(2.168)	(1.937)	(−0.796)
Advertising							1.472	0.286	−0.508
							(1.109)	(0.375)	(−0.398)
Profit	77.865	−13017.000	−6486.337						
	(0.218)	(−1.481)	(0.809)						
n	57	61	74	57	61	74	57	61	74
R^2	0.0942	0.1599	0.0295	0.0601	0.0478	0.0195	0.3976	0.0787	0.0146

[a] Significant at 1% level
[b] Significant at 5% level
[c] Significant at 10% level

t-statistics in parentheses. Concentration is defined as the Herfindahl–Hirschman index, gathered from the *1982*, *1987* and *1992 Census of Manufactures*. All other data are from COMPUSTAT. Profit is measured by operating return on sales, defined as operating income divided by net sales. Advertising and R&D are also divided by net sales. Lagged growth is the ratio of net sales lagged one year and net sales lagged two years. Investment is defined as net capital expenditures divided by total assets.

$$
\begin{aligned}
HHI_t &= \alpha_0 + \alpha_1 ADV_{t-1} + \alpha_2 R\&D_{t-1} \\
&\quad + \alpha_3 PROFIT^{t}_{t-1} + \varepsilon_t \\
ADV_t &= \beta_0 + \beta_1 PROFIT_{t-1} + \beta_2 GROWTH_{t-1} \\
&\quad + \beta_3 HHI_t + \mu_t \\
PROFIT_t &= \gamma_0 + \gamma_1 GROWTH_{t-1} + \gamma_2 R\&D_t \\
&\quad + \gamma_3 INVEST_t + \gamma_4 HHI_t + \gamma_5 ADV_t + \xi_t
\end{aligned}
\qquad (1)
$$

Because each of the three equations contains an endogenous right-hand-side variable, the system cannot be estimated consistently with OLS. Thus, the six exogenous variables in the system – lagged advertising, lagged R&D, lagged profit, lagged growth, R&D and investment – are used as instruments for estimating the system consistently using 2SLS. In the first stage, concentration, advertising and profit are regressed on all the exogenous variables in the system. In the second stage, the predicted values from the first stage regressions are used as instruments for concentration, advertising, and profit to estimate the three structural equations. Table 3 presents the 2SLS estimates of the coefficients in the structural equations for the years 1982, 1987 and 1992.

The results challenge some aspects of the standard SCP model. In the structure (concentration) equation, only the coefficient on lagged R&D is statistically significant, and only for two of the three years. The coefficient is positive, indicating that industries with higher levels of past R&D spending will tend to be more highly concentrated. This is consistent with the view that highly innovative industries tend to become more concentrated over time.[5] However, neither the coefficient on past profitability nor the coefficient on lagged advertising is significant. This suggests that neither current profitability nor current advertising creates future barriers to entry.

[5] As Waldman and Jensen (1998, p. 376) note, '[r]ecent work suggests that rather than increased concentration leading to increased R&D expenditures, increased R&D expenditures may lead to increased concentration.' Our data do not allow us to determine if the concentration changes primarily because of entry, as created by advertising and R&D expenditures, or because of changes in the inequality of firm sizes and firm exit. The latter interpretation means the firms that exit or contract in size also contribute to measured industry advertising and R&D. High barriers are only useful for explaining why entry does not depress concentration, but do not explain why the HHI increases in the first place.

Table 4. *OLS estimates with endogenous right-hand-side variables*

	Concentration			*Advertising*			*Profit*		
Dependent variable	1982	1987	1992	1982	1987	1992	1982	1987	1992
Intercept	566.410[a]	467.010[a]	887.874[a]	0.012	−0.010	0.013	−0.170[c]	0.054	0.077[a]
	(3.305)	(3.397)	(4.381)	(0.419)	(−0.432)	(0.2679)	(−1.775)	(0.763)	(3.573)
Lagged advertising	−2376.747	−4002.513	−1761.639						
	(−0.834)	(−1.403)	(−0.690)						
Lagged R&D	1998.432[b]	6568.754[a]	159.950						
	(1.993)	(3.027)	(0.258)						
Lagged profit	87.848	5395.834[c]	−233.840	0.005	0.041	0.076			
	(0.062)	(1.976)	(−0.135)	(0.080)	(0.969)	(1.166)			
Lagged growth				0.004	0.024	0.000	0.133[c]	−0.014	0.012
				(0.215)	(1.076)	(0.054)	(1.749)	(−0.222)	(0.971)
R&D							−1.327[a]	−0.411	−0.078[b]
							(−13.670)	(−1.152)	(−2.416)
Investment							1.424[a]	−0.838[c]	0.135
							(2.845)	(1.708)	(0.607)
Concentration				−0.000	−0.000	−0.000	0.000	0.000	0.000
				(−0.688)	(−0.410)	(−0.727)	(1.352)	(0.777)	(−0.878)
Advertising							0.393	0.002	0.099
							(0.443)	(0.007)	0.174
Profit	7.342	−4171.273	−1836.880						
	(0.021)	(−1.468)	(−0.816)						
n	57	61	74	57	61	74	57	61	74
R^2	0.0936	0.1773	0.0308	0.0096	0.0373	0.0272	0.8098	0.0733	0.1013

[a] Significant at 1% level
[b] Significant at 5% level
[c] Significant at 10% level
t-statistics in parentheses. Concentration is defined as the Herfindahl–Hirschman index, gathered from the *1982*, *1987* and *1992 Census of Manufactures*. All other data are from COMPUSTAT. Profit is measured by operating return on sales, defined as operating income divided by net sales. Advertising and R&D are also divided by net sales. Lagged growth is the ratio of net sales lagged one year and net sales lagged two years. Investment is defined as net capital expenditures divided by total assets.

In the conduct or advertising equations, the coefficient on concentration is significant but negative for the 1982 data, implying that advertising and concentration are inversely related. However, with the 1987 and 1992 data the coefficient on concentration becomes insignificant, so the negative coefficient may be simply an artefact of the 1982 data. Lagged growth in sales is not statistically significant; evidence is found for an industry life-cycle effect on advertising. Surprisingly, lagged profit is not significant in any year. This suggests that advertising is best regarded as a forward-looking, strategic variable: firms do not wait to accumulate cash reserves with which to fund future advertising campaigns.

In the performance or profit equations, the coefficient on HHI, as expected, is significant and positively related to the profit margin for 1982 and 1987 (though not significant for 1992). More concentrated industries tend to be more profitable. In a recent study using highly disadjusted price data and distinguishing the cyclical behaviour of prices, Baker and Woodward (1998) also find that a strong positive relationship between price change and concentration existed from 1948 to 1990. In this present study, the coefficient on advertising is not significantly related to profit in any year. Like Imel and Helmberger (1971), Grabowski and Mueller (1978), Porter (1979) and Nagle (1981), no systematic relationship is found between advertising and profitability, controlling for industry growth, R&D and investment. Interestingly, current R&D usually has a negative and statistically significant effect on current profitability in two of the three years. This is not surprising as current accounting practices allow firms to express R&D entirely in the year incurred instead of amortizing it to recognize its future benefits.

By way of comparison, Equations 4 were estimated by OLS, using the endogenous variables as regressors. Results are presented in Table 4. The findings are largely the same. In the structure or concentration equations, lagged R&D is significant in 1982 and 1987; lagged profit is also significant and positive in 1987. In the OLS results, past profitability appears to be a barrier to entry. In the conduct or advertising equations, the coefficient on concentration for 1982 becomes insignificant. In the performance or profit equations, the coefficients on concentration become insignificant for 1982 and 1987. The similarity of the OLS and 2SLS results suggests that there is not a strong endogeneity problem in the data set.

V. POTENTIAL PROBLEMS

While these 2SLS results are fairly robust to changes in variable definitions and measurement, there are other possible sources of error. First, the industry-level data are aggregated up from COMPUSTAT, which includes only publicly traded firms, so industry characteristics in industries with substantial privately held sectors are not measured precisely. Second, concentration and performance measures are always subject to problems when data are aggregated. As firms sell more than one product, actual profits are overstated in the observed industry code that the Census specifies.

As Schmalensee (1989) points out, some of these problems can be alleviated with panel data. With additional years of data, more potential instruments are available. Morever, panel data provide greater degrees of freedom by increasing the sample size, and also allow the relaxation of certain assumptions made in cross-sectional analyses. For example, cross-sectional models assume the same structure–performance relationship among all industries at one point in time. This assumption is based on the unlikely coincidence that all conditions are equal for industries. Using the time-series component of panel data allows a comparison regarding conditions over time.

VI. CONCLUSIONS

This paper expands on earlier structure–conduct–performance studies by implementing a simultaneous equations model with a lag structure to signify that structure, conduct and performance do not affect one another contemporaneously. The main findings are that (1) concentration does not depend on firm profitability, though profitability depends on concentration, (2) advertising follows a process that is independent of the factors considered here, and (3) advertising seems to have no effect on profitability. A comparison of OLS and 2SLS suggests that a simultaneous equations model can be useful for analysing the relationships between structure, conduct and performance.

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