

Kargas, Antonios; Argyroulis, Vasileios; Varoutas, Dimitrios

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Mergers and acquisitions in telecommunications market: a simultaneous equations approach to study Structure, Conduct and Performance

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Title: Mergers and acquisitions in telecommunications market: a simultaneous equations approach to study Structure, Conduct and Performance

Authors: Antonios Kargas^{1*}, Vasileios Argyroulis¹, Dimitrios Varoutas²

¹ Department of Business Administration, University of West Attica, Athens, Greece

² Department of Telecommunications and Informatics, National and Kapodistrian University of Greece, Athens, Greece

* Corresponding Author: akargas@uniwa.gr

Abstract: Paper aims to enrich readers understanding on Greek Telecommunication Industry, and more specifically on strategic decisions related with mergers and acquisitions. Even though mergers and acquisitions have long been studied in international level, the effects on market structure, on firms' conduct and, on their performance, remains an interesting topic. Current research contributes to the analysis of Greek telecommunication market, considering its current form, after a series of mergers and acquisitions that took place in previous years. An Industrial Organization's approach was adopted, namely the Structure – Conduct – Performance (SCP) framework. A SCP model, based on quantitative data, is developed for the major three telecom operators, while a two-stages least square regression analysis is conducted. By using a simultaneous equations model with lagged-dependent variables, the relationship between structure, conduct and performance is discussed. Results indicate that entry barriers exist in the market, as part of firms' conduct, shaping market's existing structure and affecting performance. Mergers and acquisitions is expected to keep playing a significant role in Greek telecommunications market since it acts as a reliable strategic option that ensures viability.

Keywords: Structure – Conduct – Performance, Simultaneous equations approach, Mergers and Acquisitions, Strategic Management, Greek Telecommunications Industry

Introduction

Mergers and acquisitions (M&A) have always been part of firms' strategy for business growth, geographical expansion and products / services development, especially in ICT business (Hossain, 2021). Changes in ownership and corporate governance, lead to market restructuring and to increased economy's competitiveness. Moreover, M&As are considered as valuable business strategies for enriching financial performance (Mugo, 2017), achieving high degree of horizontal integration (Hossain, 2021) and increasing competitiveness in domestic and international level (Datta *et al.*, 2020).

The Greek telecommunications market has faced various waves of market's expansion with new arrivals, followed by mergers and acquisitions that finally shaped its current structure. The whole procedure gathered research interest, mainly as an attempt to describe the current situation and to forecast future developments.

Current paper aims to provide useful information about mergers and acquisitions' effect on Greek telecommunications market by exploiting the pillars of Structure – Conduct – Performance (SCP) framework. The research on Structure – Conduct – Performance (SCP) covered over the years a wide range of empirical context applied on specific industries (Cool and Schendel, 1987; McGee and Thomas, 1986). Most studies involved in developing a

theoretical link between exploratory variables, are coming from the research on market's structure and firms' conduct, with performance variables. These variables format distinct conceptual pillars (Scherer and Ross, 1990) including:

1. Market Structure: putting emphasis on existing market's concentration.
2. Market Conduct: interpreting firms' behavior in terms advertising strategies / costs.
3. Performance: in terms of financial efficiency and profitability.

Although there exist researchers that include Public Policy (e.g. taxes and subsidies, international trade rules, price controls, antitrust legislation etc.) in an "extended form of SCP model" (Boyer *et al.*, 2017), this approach was not appropriate for studying the effect of mergers and acquisitions. Moreover, there are variables that directly affect both structure and conduct, while their use should be evaluated according to each industry's characteristics. Such variables are the number of patents, the minimum efficient scale (MES), the Lerner index (difference between market price and marginal cost), seller concentration, and price rigidity (Caves *et al.*, 2013; Caves and Porter, 1980; Darmon *et al.*, 2013; Mirzaei and Moore, 2014; Panagiotou, 2006; Setiawan *et al.*, 2012).

Even though SCP paradigm is a causal linear correlation between structure and performance (i.e. Structure->Conduct->Performance), this one-way-cause-effect logic has been questioned (Setiawan *et al.*, 2012). A more advanced (Leask and Parker, 2006; McGee and Thomas, 1986) two – way approach, with interactions between the various conceptual pillars has been developed by Carlton and Perloff (Carlton and Perloff, 2000).

The main research questions addressed in the paper include:

- Can SCP framework provide information regarding mergers and acquisitions in telecom market?
- In which ways market structure affects operators' conduct?
- How market structure and consequently operators' conduct can affect their performance?

In the following sections, a brief literature review on SCP model is presented, while it follows the methodology that was adopted for the analysis. Results and discussions present main findings and managerial implications related with mergers and acquisitions.

Literature Review

Structure – Conduct – Performance analysis has been used as a methodological tool for understanding several ICT technologies – oriented industries, such as telecommunications industry and market industry. Considering that telecommunications industry and content media market seem to be merged, analyses conducted with SCP methodology provided added value to current paper.

Meshor & Zajac (Meshor and Zajac, 1997) used SCP methodology in order to perform an political economy analysis of telecommunications policy, based on stakeholders' policy objectives, in Malaysia and Singapore. Results indicate that even though there existed significant differences in both market structure and stakeholders' goals (Conduct), the two countries had similar industry's performance in terms of adopting new telecom technologies ("fast followers").

Media market has been studied as well by using SCP analysis. Fu (Fu, 2003) studied content media market with SCP analysis, recognizing it as a valuable tool to interpret a market where ethical expectations should meet commercial needs. Results indicate that market structure determines the variety of products / services offered (media diversity) creating a framework where market dynamics is reflected on how much variety is produced in a content media market (Conduct). Another study, used the same methodological framework to reveal how OTT market (Over – the – Top video) is structured and how this affect behavior and performance (Qin and Wei, 2014). Results indicate that even in a highly concentrated and oligopoly – oriented market structure, competition and cooperation exist in terms of business conduct regarding several supplementary services such as license owners, content providers, Internet companies and manufacturers of smart TV. Strategic choices (Conduct) can lead to improvements in the efficiency of resource allocation and increased economies of scale as well.

Coming back to telecommunication industry, Mumuni, Luqmani and Quraeshi (Mumuni *et al.*, 2017) used SCP methodology to study the different phases in liberalization of the Saudi Arabian telecommunications market, regarding four distinct customer-based service performance outcomes, namely: (a) customer satisfaction, (b) customer attitudes, (c) customer loyalty and (d) service quality perceptions. SCP framework revealed that changes in market structure, from monopoly to the market entrance of a single competitor, significantly improved all four performance outcomes, while a reverse outcome appeared when a second competitor entered the market.

Patalinghug *et al.* (Patalinghug *et al.*, 2017) used SCP to study Philippine Telecommunications Industry, a highly concentrated industry according to results, with several entry barriers (e.g. capital requirements and subscriber base). Incumbent' s strategy / behavior can significantly influence the market structure in terms of technological innovation, pricing and products offered to subscribers. Both factors, market structure and conduct of incumbent, have significant impact on industry' s performance.

As far infrastructure sharing is concerned, the subject gained academic interest, with Frisanco *et al.* (Frisanco *et al.*, 2008) as mean to lead to shared operations among mobile operators. Recognizing infrastructure as a “hot topic”, authors put emphasis not only on technological aspects but moreover to strategic issues alongside with financial, technical and regulatory issues. Critical aspects were recognized, including the existence of networks with older technologies and variation of geography with rural, urban and suburban areas. While a series of benefits were recognized, authors suggested outsourcing as a significant option, due to economies of scale, alignment requirements and overall complexity as well. Outsourcing, in terms of service provider or network provider, could guarantee neutral governance, increased confidentiality regarding each operators' data / information, while the principal – agent problem is avoided.

Most significant research was conducted by Alexander Osei-Owusu and Anders Henten (Osei-Owusu and Henten, 2017) who used the Structure – Conduct – Performance framework in order to study telecommunication industry in Ghana regarding the possibilities of network tower sharing as a basic element for telecom infrastructure diffusion. Even though network tower sharing was a regulator' s strategy to expand telecom infrastructure diffusion, results proved to be against expectations. In all geographical areas (urban, suburban and rural) operators preferred to build their own individual towers, leading to multiple tower investments at the same locations. Even in large cities, where expectations were high, co –

locations reached only 40% of towers, while in most cases co – location involved just one (1) co – locator (not multi – locators). SCP framework analysis provide evidence about this mis – conduct. Market structure and significance of incumbent operator’s market power is the main reason for this situation. Tower companies proved to be “dependent” from incumbent operator, leading to business decisions that mainly favor incumbent to maintain its dominance. Such decisions can include co – locations contracts with competitors and pricing of infrastructure. Such a market structure led existing competitors and new entrants to build their own towers, while telecom infrastructure diffusion as a whole was hold back due to single cost ownership. The degree of concentration in the market alongside with the operators’ size, were the two most significant factors, shaping market structure and leading to the above – described conduct. Under such conditions, firms’ performance was affected by incumbent’s influence on market structure.

Methodology

The above mentioned researches indicate that the Structure – Conduct – Performance (SCP) framework has been used in various industries, across different economic environments (Caves and Porter, 1980; Darmon *et al.*, 2013; Panagiotou, 2006). According to each industry’s characteristics different measures have been used to evaluate market’s structure, firms’ conduct and their performance (Delorme *et al.*, 2010).

Market structure for example can include number of sellers and buyers, product differentiation, barriers to entry, cost structures, vertical integration, and diversification. Firms’ conduct from the other hand can be analyzed in terms of pricing behavior, product strategy and advertising, research and innovation, plant investments, and legal tactics. Finally, performance can be analyzed in both terms of financial and customers’ welfare, production and allocative efficiency, full employment, and also profitability (return on assets or return on equity).

Moreover, there exist a variety of econometric approaches when it comes to empirically evaluate the SCP framework (Bain, 1951; Baker and Woodward, 1998; Gupta *et al.*, 1983; Schmalensee, 1989; Weiss, 1979). Current research is following Kambhampati’s (Kambhampati, 1996) simultaneous equations approach, as it was used by Delorme *et al.* (Delorme *et al.*, 2010). Such an approach includes the traditional three regression equations that examine (a) market structure, (b) firms’ conduct and (c) their performance as a function of the other two variables:

- Structure = f (Conduct, Performance)
- Conduct = f (Structure, Performance)
- Performance = f (Structure, Conduct)

Simultaneous equations model is employed for the analysis, while the main differentiation lies on the assumption of rejecting the idea each variable can influence the other two variables contemporaneously. That is why a lagged – dependent – variable approach is adopted when needed. According to this approach, “Structure” can be affected by both lagged conduct, as an indication of entry barriers in the market, and lagged performance since it affects both incumbents and potential entrants. Moreover, “Conduct” is mainly affected from last year’s profits (performance) rather than firm’s current performance. Only, “Performance” remains as the traditional SCP model indicates, without any lagged variable.

Information was gathered for the 3 major Greek telecom operators, including both mobile and fixed telephony's data. Data were available in these operators publicly available yearly financial reports (Annual balance-sheet), as well as in Greek National Regulatory Authority's annual reports (Hellenic Telecommunications & Post Commission) where data regarding market's concentration were gathered in order to compute Herfindahl – Hirschman index (HHI). Data covers a period of 8 years from 2014 up to 2021.

Descriptive statistics of the variables used are given in Table 1 below.

Table 1 Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Concentration	24	3783	3834	3803,00	17,686
Advertising	24	2,1159	7,1860	3,649322	1,2006290
Advertising Lagged	21	2,2429	5,9427	3,620776	,9029703
R&D	24	4,1906	30,1513	11,571979	8,5763907
R&D Lagged	21	4,1906	29,6817	10,927341	8,1019445
Profit	24	4,3254	80,6003	25,975055	14,6721861
Profit Lagged	21	4,3254	40,9298	22,790212	8,9689592
Growth Lagged	21	,8462	105,8101	34,575936	48,6779200
Valid N (listwise)	21				

The model uses concentration as the dependent variable in structure equation, advertising as conduct's dependent variable and profit margin as performance dependent variable. The equations that finally developed a system of three linear equations and were used to estimate the model are given bellow.

The market structure equation includes:

$$HHI_t = a_0 + a_1 * ADV_{t-1} + a_2 * R\&D_{t-1} + a_3 * PROFIT_{t-1}^t + e_t \quad (1)$$

The firms' conduct / behavior equation includes:

$$ADV_t = \beta_0 + \beta_1 * PROFIT_{t-1} + \beta_2 * GROWTH_{t-1} + \beta_3 * HHI_t + \mu_t \quad (2)$$

The market's performance equation includes:

$$PROFIT_t = \gamma_0 + \gamma_1 * GROWTH_{t-1} + \gamma_2 * R\&D_t + \gamma_3 * HHI_t + \gamma_4 * ADV_t \xi_t \quad (3)$$

As far as structure equation is concerned, market's concentration is computed by Herfindahl – Hirschman index (HHI) and is considered as the dependent variable, while independent variables include lagged advertising (ADV), lagged research and development (R&D) and lagged performance (PROFIT). Advertising and research & development are coming as firms' conduct and are valuable in shaping market's structure because it can act as market barriers.

Firms' conduct equation includes advertising as dependent variable, while independent variables are lagged performance (PROFIT), lagged growth (GROWTH) and market's concentration (HHI). Finally, performance's equation has profits as dependent variable, while independent variables include lagged growth (GROWTH), research and development (R&D), market's concentration (HHI) and advertising (ADV).

As already mentioned, concentration is measured by Herfindahl – Hirschman index (HHI). Advertising (ADV) is mainly expressing advertising intensity and is calculated as advertising expenditures divided by net sales. Following the same logic research and development (R&D) is expressing the R&D intensity and is calculated as R&D expenditures divided by net sales. Profit is measured by operating return on sales, calculated as operating income divided by net sales. Finally, lagged growth is the ratio of net sales lagged one year and net sales lagged two years.

Finally, SPSS statistical software was used and two-stage least squares (2SLS) regression was applied in order to estimate the simultaneous equations model with the included lag structure. The two-stage least squares (2SLS) was selected as more appropriate to construct coefficient estimates for each of the exogenous and endogenous variables. Concentration, advertising and profit are the endogenous variables, while exogenous variables include lagged advertising, R&D, lagged R&D, lagged growth and lagged profit. The above-mentioned exogenous variables are the tool for estimating the system by using 2SLS.

Results

In the market's structure equation, all coefficients are statistically significant. Lagged advertising and lagged R&D are both statistically significant and positive. The more existing companies spend on research and development, alongside with advertising, the more concentrated the market will be. As far as R&D is concerned, this is consistent with the idea that more innovative an industry is, the more concentrated becomes over time (Waldman and Jensen, 2019). Additionally, advertising has gained research interest not only as a marketing tool but moreover as a significant market's entry barrier (Couto and Barbosa, 2020). From the other hand lagged profitability is statistically significant but negative, indicating that increased profitability acts as a motive for new entrants that can reduce market's concentration.

In the firm's conduct equation, only lagged growth is statistically significant, while concentration and lagged profitability are not – statistically significant, even though positive. Less expected results is that lagged profitability is not statistically significant, even though there exist other researches providing the same results (Delorme *et al.*, 2010). This fact can be interpreted as a firms' tension to develop future advertising campaigns, even without funding resources being guaranteed. Adopting such a framework suggests that advertising should be better being addressed as a forward-looking, strategic variable. Moreover, sales' growth tension seems to be the most effective variable when it comes to firms' conduct, more effective than profits themselves. Finally, having a statistically significant lagged growth indicates that industry's life cycle (in terms of sales) has a positive impact on advertising.

In the performance equation, the coefficient on concentration is statistically significant and negative to the profit margin. This is a rather surprising result since the theory presumes that industries with high concentration tend to provide higher profitability to firms. Such a tension further strengthens our findings in market's structure equation where a negative relationship between lagged profit and concentration was explained as a motive for new entrants in the market.

As far as advertising and lagged growth are concerned, a non-statistically significant relationship with profits was revealed. Both results are consistent with previous studies and results (Nagle, 1981; Porter, 1979). Finally, running research and development has a positive and statistically significant coefficient on current profitability. Existing research has revealed mixed tendencies in the proposed relationship with strong, positive relationships occurred in earlier periods and a stabilization tension existing when it comes to nowadays marginal returns to R&D investments (Curtis *et al.*, 2020).

Results are presented below in Table 2.

Table 2 Two-stage least squares estimates

Dependent variable	Concentration	Advertising	Profit
Intercept	3.796,157 ^a (230,348)	-14,761 ^{NS} (-0,344)	1.502,865 ^b (2,890)
Lagged advertising	7,501 ^c (1,793)		
Lagged R&D	0,974 ^c (2,025)		
Lagged profit	-1,277 ^b (-2,890)	0,033 ^{NS} (1,446)	
Lagged growth		0,019 ^a (4,987)	0,042 ^{NS} (0,516)
R&D			1,345 ^a (3,840)
Concentration		0,004 ^{NS} (0,398)	-0,394 ^b (-2,885)
Advertising			2,045 ^{NS} (0,671)
Profit			
R ²	0,365	0,628	0,584

a Significant at 1% level

b Significant at 5% level

c Significant at 10% level

NS - non statistically significant

t-statistics in parentheses.

It is worth mentioning that market structure, expressed as concentration is statistically related with both firms' conduct and performance. Such a finding supports the more advanced two – way SCP approach, with interactions between the various conceptual pillars, as developed by Carlton and Perloff (Carlton and Perloff, 2000). This interactive SCP framework is better suited on addressing micro-economic-related research issues at industry and inter-industry levels (Mirzaei and Moore, 2014; Setiawan *et al.*, 2012), while it is in accordance with the more firm-level-oriented, resource-based paradigm, addressing more firm-specific strategic issues regarding sustainable competitive advantage (Leask and Parker, 2006; McGee and Thomas, 1986).

Discussion

The Greek telecommunication market faced significant changes over the past thirty years (Kargas, 2014; Laitso *et al.*, 2017; Papadimitriou and Kargas, 2012; Zambarloukou, 2010), starting from a state-owned monopoly condition as far as fixed telephony is concerned, passing to a privatization phase (Constantinou and Lagoudakis, 1996) and to a liberalization phase afterwards (Moutafides and Economides, 2011). From the other hand mobile telephony started with two private companies (Caloghirou and Constantelou, 1995) with a third company owned from the former state-owned monopoly entered a few years later.

The following years the number of operators in both fixed and mobile telephony increased rapidly, with more than eleven (11) fixed operators performing in 2011, while the number of mobile operators was three (3) at the same period of time. Since then, Greek economy faced various waves of economic crisis, leading market to a further shrinkage in both demand and supply. As far as demand is concerned, a series of mergers and acquisitions took place, while most of them happened after Greek economic crisis of 2009. By the end of 2020, there existed three mobile network operators (MNOs) and four main fixed telephony and broadband operators. Most significant mergers and acquisitions that took place are presented in the following Table 3.

Table 3 Mergers and acquisitions in Greek Telecom Market

Type	Year	Initial Companies	New Company
Acquisition	2005	TIM S.p.A.	TIM Hellas
Merger	2006	Q-Telecom - TIM Hellas	TIM Hellas
Acquisition	2006	Telepassport Hellas S.A. - Lannet	Lannet
Acquisition	2006	Cosmote - OTE S.A.	OTE S.A.
Merger	2007	Tellas - Wind Hellas	Wind Hellas
Merger	2008	OTE S.A. - Deutsche Telekom	Deutsche Telekom
Acquisition	2012	Vivodi Telecom - On Telecom	On Telecom
Acquisition	2015	VoiceNet - OTE S.A.	OTE S.A.
Acquisition	2016	Hellas Online S.A. - Vodafone Greece	Vodafone Greece
Acquisition	2019	Cyta Hellas S.A. - Vodafone Greece	Vodafone Greece
Acquisition	2021	Nova S.A. - Wind Hellas	Wind Hellas
Merger	2023	Nova (former WIND Hellas) - United Group	United Group

Nowadays, there are three (3) main operators, providing both mobile/fixed telephony and broadband services, after the above-mentioned mergers & acquisitions, namely:

- Cosmote, which is a 100% subsidiary of the OTE Group of Companies, where 51.6% belongs to the German multinational Deutsche Telekom.
- Nova Telecommunications & Media (formerly WIND Hellas), which is a 100% subsidiary of the Dutch multinational United Group.
- Vodafone Greece (formerly Panafon), which is a Greek subsidiary of the British multinational Vodafone, which it owns 99.878% through Vodafone Europe B.V.

Current research enlight the market's conditions in which mergers and acquisitions took place or will take place in the next years, by revealing how market's concentration, firms' conduct and their performance (profit margin) can act as barriers or accelerators of such strategic decisions. It contributes to better understand aspects of mergers and acquisitions that remain

theoretically and empirically underexplored (Bauer and Matzler, 2014; Haleblian *et al.*, 2009; Kolev *et al.*, 2012), including the role of different temporal and spatial contexts (Angwin *et al.*, 2022).

Existing literature mainly focuses on macroeconomic factors (e.g. financial approaches) that can lead to intense “acquisition waves” (Harford, 2005), on “micro” perspective (e.g. strategic management literature) that focuses on the “time” (early or late) of such a decision (Andonova *et al.*, 2013; Carow *et al.*, 2004), on market power and economies of scale (e.g. economic approach) as motivational factors that lead to M&A (Thanos *et al.*, 2020; Thanos and Papadakis, 2012) and on distinct firms’ characteristics (Haleblian *et al.*, 2012).

Current research provides an alternative framework of understanding the market’s environment in which mergers and acquisitions occur. Taking as case study the Greek telecommunications market, results indicate that existing market structure and the high level of market’s concentration is mainly achieved by using advertising and R&D as entry barriers. Of course, in telecommunications industry there exist more than these two elements that act as entry barriers (e.g. regulatory, technological and investment issues), while there exist new forms of business strategies aiming to reduce its impact. For example, infrastructure sharing strategies aim to provide involving companies with a cost – oriented competitive advantage. Reduced infrastructure cost can drive resources to new directions (e.g. more R&D, advertising or new investments), developing new forms of firms’ conduct and reshaping market’s structure. Under such a framework the whole equation model should be re-evaluated.

Moreover, firm’s profitability seems to prevent new entrants, since a negative relationship exists between market’s concentration and profit margins. Existing research indicates that increased market power does not necessary leads to higher economic profits (De Loecker *et al.*, 2020). There exist a series of reasons interpreting a negative relationship between concentration and profitability, namely: implementation of new products, increased fixed costs, decreased marginal costs, changes in market’s structure, an increase in demand or in its elasticity, etc. Such conditions create the environment for further investing in telecom market via mergers and acquisitions, rather than developing a new firm from the scratch. Such an approach was adopted by United Group when acquired Nova (former Wind Hellas) in 2023.

Existing telecommunication companies have adapted their behavior (conduct) in such a framework by putting emphasis on their sales, while advertising is used as a forward-looking, strategic variable, being unrelated with previous years profits. Operators’ performance is mainly based on keeping market’s concentration on the existing, high levels, while there exists a statistically significant approach to use research and development as an entry – barrier tool.

From a methodologically point of view, results revealed that the SCP model in its extended form can be applied, providing significant information about market’s structure, firms’ conduct and their performance in Greek telecommunications market that has been used as case study. Moreover, proposed results are indicative of tensions existing in telecommunication industry in different European environments.

Future Research

As part of future research, it would be valuable to include “investments” as part of performance equation in order to incorporate whether such a variable plays significant role or if infrastructure – sharing models applied in Greek telecom market has reduced its importance. The variable was not applied in current paper since data about telecom operators’ investment are not public available. Finally, authors believe that expanding their

research before 2014 could make it feasible to create two distinct periods of analysis before and after 2012, so that to validate the theory of M&A's waves.

References:

- Andonova, V., Rodriguez, Y. and Sanchez, I.D. (2013), "When waiting is strategic: Evidence from Colombian M&As 1995–2008", *Journal of Business Research*, Elsevier, Vol. 66 No. 10, pp. 1736–1742.
- Angwin, D.N., Urs, U., Appadu, N., Thanos, I.C., Vourloumis, S. and Kastanakis, M.N. (2022), "Does merger & acquisition (M&A) strategy matter? A contingency perspective", *European Management Journal*, Pergamon, Vol. 40 No. 6, pp. 847–856.
- Bain, J.S. (1951), "Relation of profit rate to industry concentration: American manufacturing, 1936–1940", *Quarterly Journal of Economics*, Vol. 65 No. 3, pp. 293–324.
- Baker, J. and Woodward, P. (1998), "Market power and the cross-industry behavior of prices around a business cycle trough", *Federal Trade Commission Working Paper*, available at: https://digitalcommons.wcl.american.edu/fac_works_papers/50 (accessed 7 June 2023).
- Bauer, F. and Matzler, K. (2014), "Antecedents of M&A success: The role of strategic complementarity, cultural fit, and degree and speed of integration", *Strategic Management Journal*, John Wiley & Sons, Ltd, Vol. 35 No. 2, pp. 269–291.
- Boyer, M., Ross, T.W. and Winter, R.A. (2017), "The rise of economics in competition policy: A Canadian perspective", *Canadian Journal of Economics*, Blackwell Publishing Ltd, Vol. 50 No. 5, pp. 1489–1524.
- Caloghirou, Y.D. and Constantelou, N. (1995), "Telecommunications infrastructure competition in Greece: Potential scenarios for future debates", *Telecommunications Policy*, Butterworth Scientific, [etc.], Guildford, Surrey, Vol. 19 No. 4, p. 313.
- Carlton, D.W. and Perloff, J.M. (2000), *Modern Industrial Organization*, Reading MA: Addison., Addison-Wesley.
- Carow, K., Heron, R. and Saxton, T. (2004), "Do early birds get the returns? An empirical investigation of early-mover advantages in acquisitions", *Strategic Management Journal*, John Wiley & Sons, Ltd, Vol. 25 No. 6, pp. 563–585.
- Caves, R.E. and Porter, M.E. (1980), "The Dynamics of Changing Seller Concentration", *The Journal of Industrial Economics*, JSTOR, Vol. 29 No. 1, p. 1.
- Caves, R.E., Whinston, M.D. and Hurwitz, M.A. (2013), "Patent Expiration, Entry, and Competition in the U.S. Pharmaceutical Industry", *American Journal of Industry and Business Management*, Vol. 3 No. 2, pp. 164–177.
- Constantinou, P. and Lagoudakis, A. (1996), "The Greek telecommunications policies and the EU directives", *Telecommunications Policy*, Pergamon, Vol. 20 No. 4, pp. 261–271.
- Cool, K.O. and Schendel, D. (1987), "Strategic Group Formation and Performance: The Case of the U.S. Pharmaceutical Industry, 1963–1982", <Http://Dx.Doi.Org/10.1287/Mnsc.33.9.1102>, *INFORMS*, Vol. 33 No. 9, pp. 1102–1124.
- Couto, A. and Barbosa, N. (2020), "Barriers to entry: An empirical assessment of Portuguese firms' perceptions", *European Research on Management and Business Economics*, Vol.

26 No. 2, pp. 55–62.

- Curtis, A., McVay, S. and Toynbee, S. (2020), “The changing implications of research and development expenditures for future profitability”, *Review of Accounting Studies*, Vol. 25 No. 2, pp. 405–437.
- Darmon, R.Y., Duclos-Gosselin, L., Rigaux-Bricmont, B., Darmon, R.Y., Duclos-Gosselin, L. and Rigaux-Bricmont, B. (2013), “A Measure of Dynamic Market Performance”, *American Journal of Industrial and Business Management*, Scientific Research Publishing, Vol. 3 No. 2, pp. 164–177.
- Datta, D.K., Basuil, D.A. and Agarwal, A. (2020), “Effects of board characteristics on post-acquisition performance: A study of cross-border acquisitions by firms in the manufacturing sector”, *International Business Review*, Pergamon, Vol. 29 No. 3, p. 101674.
- Delorme, C.D., Kamerschen, D.R., Klein, P.G. and Voeks, L.F. (2010), “Structure, conduct and performance: a simultaneous equations approach”, *Applied Economics*, Taylor & Francis Group, Vol. 34 No. 17, pp. 2135–2141.
- Frisanco, T., Tafertshofer, P., Lurin, P. and Ang, R. (2008), “Infrastructure sharing and shared operations for mobile network operators: From a deployment and operations view”, *IEEE International Conference on Communications*, Institute of Electrical and Electronics Engineers Inc., pp. 2193–2200.
- Fu, W. (2003), “Applying the structure-conduct-performance framework in the media industry analysis”, *International Journal on Media Management*, Taylor & Francis Group, Vol. 5 No. 4, pp. 275–284.
- Gupta, V.K., Gupta and K, V. (1983), “A Simultaneous Determination of Structure, Conduct and Performance in Canadian Manufacturing”, *Oxford Economic Papers*, Oxford University Press, Vol. 35 No. 2, pp. 281–301.
- Haleblian, J., Devers, C.E., McNamara, G., Carpenter, M.A. and Davison, R.B. (2009), “Taking Stock of What We Know About Mergers and Acquisitions: A Review and Research Agenda”, *Journal of Management*, SAGE Publications Sage CA: Los Angeles, CA, Vol. 35 No. 3, pp. 469–502.
- Haleblian, J., McNamara, G., Kolev, K. and Dykes, B.J. (2012), “Exploring firm characteristics that differentiate leaders from followers in industry merger waves: a competitive dynamics perspective”, *Strategic Management Journal*, John Wiley & Sons, Ltd, Vol. 33 No. 9, pp. 1037–1052.
- Harford, J. (2005), “What drives merger waves?”, *Journal of Financial Economics*, North-Holland, Vol. 77 No. 3, pp. 529–560.
- Hossain, M.S. (2021), “Merger & Acquisitions (M&As) as an important strategic vehicle in business: Thematic areas, research avenues & possible suggestions”, *Journal of Economics and Business*, Elsevier, Vol. 116, p. 106004.
- Kambhampati, U.S. (1996), *Industrial Concentration and Performance : A Study of the Structure, Conduct, and Performance of Indian Industry*, Oxford University Press, New Delhi, India.
- Kargas, A. (2014), *Organizational Structure, Operational Strategy, Indexes and Forecasting in the Telecommunication Market*, National and Kapodistrian University of Athens: Department of Informatics and Telecommunications, available at:

<http://hdl.handle.net/10442/hedi/42643>.

- Kolev, K., Haleblan, J. and McNamara, G. (2012), "A review of the merger and acquisition wave literature : history, antecedents, consequences, and future directions", *The Handbook of Mergers and Acquisitions*, Oxford University Press, Oxford , pp. 19–39.
- Laitsou, E., Kiriakidis, M., Kargas, A. and Varoutas, D. (2017), "Fixed-mobile convergence in telecom markets: Evidence from Greece", *2017 Internet of Things Business Models, Users, and Networks*, Vol. 2018-Janua, IEEE, pp. 1–5.
- Leask, G. and Parker, D. (2006), "Strategic group theory: Review, examination and application in the UK pharmaceutical industry", *Journal of Management Development*, Emerald Group Publishing Limited, Vol. 25 No. 4, pp. 386–408.
- De Loecker, J., Eeckhout, J. and Unger, G. (2020), "The Rise of Market Power and the Macroeconomic Implications*", *The Quarterly Journal of Economics*, Vol. 135 No. 2, pp. 561–644.
- McGee, J. and Thomas, H. (1986), "Strategic groups: Theory, research and taxonomy", *Strategic Management Journal*, John Wiley & Sons, Ltd, Vol. 7 No. 2, pp. 141–160.
- Meshor, G.M. and Zajac, E.E. (1997), "The political economy of telecommunications in Malaysia and Singapore: A structure–conduct–performance comparative analysis", *Information Economics and Policy*, North-Holland, Vol. 9 No. 3, pp. 183–202.
- Mirzaei, A. and Moore, T. (2014), "What are the driving forces of bank competition across different income groups of countries?", *Journal of International Financial Markets, Institutions and Money*, North-Holland, Vol. 32 No. 1, pp. 38–71.
- Moutafides, G.M. and Economides, A.A. (2011), "Demand for broadband access in Greece", *Telematics and Informatics Telematics and Informatics*, Vol. 28 No. 2, pp. 125–141.
- Mugo, A. (2017), "Effects of merger and acquisition on financial performance: Case study of commercial banks.", *International Journal of Business Management and Finance*, Vol. 1 No. 1, available at: <https://serialpublishers.org/index.php/ijbmf/article/view/37> (accessed 11 December 2022).
- Mumuni, A.G., Luqmani, M. and Quraeshi, Z.A. (2017), "Telecom market liberalization and service performance outcomes of an incumbent monopoly", *International Business Review*, Vol. 26 No. 2, pp. 214–224.
- Nagle, T.T. (1981), "Do Advertising-Profitability Studies Really Show That Advertising Creates a Barrier to Entry?", *Journal of Law and Economics*, University of Chicago Press, Vol. 24 No. 2, pp. 333–349.
- Osei-Owusu, A. and Henten, A. (2017), "Network tower sharing and telecom infrastructure diffusion in Ghana - a Structure-Conduct-Performance approach", International Telecommunications Society (ITS), Calgary, available at: <http://hdl.handle.net/10419/178421>.
- Panagiotou, G. (2006), "The impact of managerial cognitions on the structure-conduct-performance (SCP) paradigm: A strategic group perspective", *Management Decision*, Vol. 44 No. 3, pp. 423–441.
- Papadimitriou, A. and Kargas, A. (2012), "The relationship between organizational culture and market orientation in the Greek telecommunication companies", *NETNOMICS: Economic Research and Electronic Networking*, available

at:<https://doi.org/10.1007/s11066-012-9066-0>.

- Patalinghug, E.E., Manuela Jr., W.S., Manzano - Lizares, R. and Patalinghug, J.C. (2017), "Assessment of the Structure, Conduct, and Performance of the Philippine Telecommunications Industry", *SSRN Electronic Journal*, available at:<https://doi.org/10.2139/ssrn.2912238>.
- Porter, M.E. (1979), "The Structure within Industries and Companies' Performance", *The Review of Economics and Statistics*, MIT Press, Vol. 61 No. 2, pp. 214–27.
- Qin, Q. and Wei, P. (2014), "The Structure-Conduct-Performance Analysis of OTT Media", *Advances in Management and Applied Economics*, Vol. 4 No. 5, pp. 29–39.
- Scherer, F.M. (Frederic M. and Ross, D. (David R. (1990), *Industrial Market Structure and Economic Performance*, Third edition., Houghton Mifflin, Boston.
- Schmalensee, R. (1989), "Chapter 16 Inter-industry studies of structure and performance", *Handbook of Industrial Organization*, Elsevier, Vol. 2, pp. 951–1009.
- Setiawan, M., Emvalomatis, G. and Oude Lansink, A. (2012), "Structure, conduct, and performance: evidence from the Indonesian food and beverages industry", *Empirical Economics* 2012 45:3, Springer, Vol. 45 No. 3, pp. 1149–1165.
- Thanos, I.C. and Papadakis, V.M. (2012), "The use of accountingbased measures in measuring M&A performance. A review of five decades of research", *Advances in Mergers and Acquisitions*, Vol. 10, pp. 103–120.
- Thanos, I.C., Papadakis, V.M. and Angwin, D. (2020), "Does changing contexts affect linkages throughout the mergers and acquisition process? A multiphasic investigation of motives, pre- and post-acquisition and performance", *Strategic Change*, John Wiley & Sons, Ltd, Vol. 29 No. 2, pp. 149–164.
- Waldman, D.E. and Jensen, E.J. (2019), *Industrial Organization : Theory and Practice*, 5th Edition., Routledge, New York, available at:<https://doi.org/10.4324/9781315157405>.
- Weiss, L.W. (1979), "The Structure-Conduct-Performance Paradigm and Antitrust", *University of Pennsylvania Law Review*, JSTOR, Vol. 127 No. 4, p. 1104.
- Zambarloukou, S. (2010), "Ownership, corporate governance and industrial relations in the banking and telecommunications sectors: the case of Greece", *Industrial Relations Journal*, Blackwell Publishing, Vol. 41 No. 3, pp. 233–248.