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**Feedback Nash equilibrium for dynamic brand and channel advertising in dual channel supply chain.** (English) [Zbl 1293.90034](#)

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Summary: This paper investigates dynamic brand and channel advertising and their effects on market expansion and market share in a dual channel supply chain by using differential game theory. Nash equilibrium of the differential game will be obtained by the feedback approach. A sensitivity analysis was performed to assess the impact of key parameters on optimal strategies and to characterize behaviors of both the manufacturer and retailer over time. Comparative statistics show that a higher compatibility of a product with online marketing leads to a higher advertising effort for the online channel by the manufacturer, an enhanced steady state for demand of the brand as well as greater sales in the steady state through the online channel.

**MSC:**

[90B60](#) Marketing, advertising

[91A80](#) Applications of game theory

[91A23](#) Differential games (aspects of game theory)

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**Keywords:**

direct marketing; dynamic advertising; differential game theory; feedback Nash equilibrium; online channel

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**References:**

- [1] Cassar, K.; Swerdlow, F.S.; Kim, H.; Johnson, M., Local commerce: Internet threat mandates brick-and-mortar reconstruction, No. 11, (2000)
- [2] Brynjolfsson, E.; Smith, M.D., Frictionless commerce? A comparison of Internet and conventional retailers, *Manag. Sci.*, 46, 563-585, (2000)
- [3] Smith, M.D.; Bailey, J.; Brynjolfsson, E.; Brynjolfsson, E. (ed.); Kahin, B. (ed.), *Understanding digital markets: review and assessment*, (2000), Cambridge
- [4] Chiang, W.Y.; Chhajed, D.; Hess, J.D., Direct marketing, indirect profits: a strategic analysis of dual channel supply chain design, *Manag. Sci.*, 49, 1-20, (2003) · [Zbl 1232.90231](#)
- [5] Jørsengen, S., Zaccour, G.: *Differential Games in Marketing*. Kluwer Academic, Boston (2004)
- [6] He, X.; Prasad, A.; Sethi, S.P.; Gutierrez, G.J., A survey of Stackelberg differential game models in supply and marketing channels, *J. Syst. Sci. Syst. Eng.*, 16, 385-413, (2007)
- [7] Amrouche, N.; Martin-Herran, G.; Zaccour, G., Pricing and advertising of private and national brands in a dynamic marketing channel, *J. Optim. Theory Appl.*, 137, 465-483, (2008) · [Zbl 1152.91023](#)
- [8] Amrouche, N.; Martin-Herran, G.; Zaccour, G., Feedback Stackelberg equilibrium strategies when the private label competes with the national brand, *Ann. Oper. Res.*, 164, 79-95, (2008) · [Zbl 1170.91313](#)
- [9] Karray, S.; Zaccour, G.; Haurie, A. (ed.); Zaccour, G. (ed.), *A differential game of advertising for national and store brands*, 213-230, (2005), New York · [Zbl 1182.91040](#)
- [10] Karray, S.; Martin-Herran, G., A dynamic model for advertising and pricing competition between national and store brands, *Eur. J. Oper. Res.*, 193, 451-467, (2009) · [Zbl 1151.91062](#)
- [11] Viscolani, B.; Zaccour, G., Advertising strategies in a differential game with negative competitor's interference, *J. Optim. Theory Appl.*, 140, 153-170, (2009) · [Zbl 1173.91019](#)
- [12] Jørgensen, S.; Taboubi, S.; Zaccour, G., Cooperative advertising in a marketing channel, *J. Optim. Theory Appl.*, 110, 145-158, (2001) · [Zbl 0980.91006](#)
- [13] Buratto, A.; Grosset, L.; Viscolani, B., Advertising coordination games of a manufacturer and a retailer while introducing a new product, *Top*, 15, 307-321, (2007) · [Zbl 1142.49019](#)
- [14] He, X.; Krishnamoorthy, A.; Prasad, A.; Sethi, S.P., Retail competition and cooperative advertising, *Oper. Res. Lett.*, 39, 11-16, (2011) · [Zbl 1208.90093](#)
- [15] Prasad, A.; Sethi, S.P., Competitive advertising under uncertainty: a stochastic differential game approach, *J. Optim. Theory*

- Appl., 123, 163-185, (2004) · [Zbl 1114.90050](#)
- [16] He, X.; Prasad, A.; Sethi, S.P., Cooperative advertising and pricing in a stochastic supply chain: feedback Stackelberg strategies, *Prod. Oper. Manag.*, 18, 78-94, (2009)
- [17] Krishnamoorthy, A.; Prasad, A.; Sethi, S.P., Optimal pricing and advertising in a durable-good duopoly, *Eur. J. Oper. Res.*, 200, 486-497, (2010) · [Zbl 1177.90232](#)
- [18] Bass, F.M.; Krishnamoorthy, A.; Prasad, A.; Sethi, S.P., Generic and brand advertising strategies in a dynamic duopoly, *Mark. Sci.*, 24, 556-568, (2005)
- [19] Nair, A.; Narasimhan, R., Dynamics of competing with quality- and advertising-based goodwill, *Eur. J. Oper. Res.*, 175, 462-474, (2006) · [Zbl 1137.91467](#)
- [20] Giovanni, P.D., Quality improvement vs. advertising support: which strategy works better for a manufacturer?, *Eur. J. Oper. Res.*, 208, 119-130, (2011) · [Zbl 1206.90066](#)
- [21] Erickson, G.M., An oligopoly model of dynamic advertising competition, *Eur. J. Oper. Res.*, 197, 374-388, (2009) · [Zbl 1157.91316](#)
- [22] Grosset, L.; Roberti, P.; Viscolani, B., A goodwill model with predatory advertising, *Oper. Res. Lett.*, 39, 419-422, (2011) · [Zbl 1235.91072](#)
- [23] Huang, J.; Leng, M.; Liang, L., Recent developments in dynamic advertising research, *Eur. J. Oper. Res.*, 220, 591-609, (2012) · [Zbl 1253.90125](#)
- [24] Vidale, M.L.; Wolfe, H.B., An operations research study of sales response to advertising, *Oper. Res.*, 5, 370-381, (1957)
- [25] Nerlove, M.; Arrow, K.J., Optimal advertising policy under dynamic conditions, *Economica*, 39, 129-142, (1962)
- [26] Sorger, G., Competitive dynamic advertising: a modification of the case game, *J. Econ. Dyn. Control*, 13, 55-80, (1989) · [Zbl 0657.90031](#)
- [27] Liang, T.; Huang, J., An empirical study on consumer acceptance of products in electronic markets: a transaction cost model, *Decis. Support Syst.*, 24, 29-43, (1998)
- [28] Yan, R.; Guo, P.; Wang, J.; Amrouche, N., Product distribution and coordination strategies in a multi-channel context, *J. Retail. Consum. Serv.*, 18, 19-26, (2011)
- [29] Hess, J.; Gerstner, E.; Chu, W., Controlling product returns in direct marketing, *Mark. Lett.*, 7, 307-317, (1996)

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