Cournot duopoly and insider trading with two insiders

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Abstract

We study the effect of competition among insiders in an extension of the static Kyle [Kyle, A. (1985). Continuous auctions and insider trading. *Econometrica*, 53, 1315–1335] model of insider trading introduced by Jain and Mirman (JMC) [Jain, N., & Mirman, L.J. (2002). Effects of insider trading under different market structures. *The Quarterly Review of Economics and Finance*, 42, 19–39]. In the JMC model competition in the real sector is introduced. In this paper we introduce competition in the stock sector in the JMC model by assuming that there is a manager who is responsible for making the real decisions of the firm as well as an 'owner' who has the same information as the manager but has no managerial responsibilities. In this way we can study the interaction between competition in the real sector and competition in the financial sector. We show that the stock price set by the market makers reveals more information than in the JMC model and that the expected equilibrium values of the manager's profits sometimes decline and sometimes increase depending on the exogenous parameters of the model. Moreover, we prove that due to the competition in the financial sector, the level of output produced by the firm is less than in JMC. Finally, we also study the effect of financial competition in the case in which the market makers receive only one signal and analyze the comparative statics in this case.
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1. Introduction

Economic models that study the effect of financial decisions of the firm should also include the effect of these decisions on the real aspects of the firm, since real and financial effects are

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inextricably intertwined. Ignoring the financial aspect of a firm that depends on external financing, like a public firm, misses a significant constraint on the performance of that firm in the real sector. For example, the work of Kyle (1985) in studying insider trading does not account for the effect of the insider trades on the real part of the firm. Although many insights about the trades of the insider and the informational content of these trades are possible in the Kyle model, the impact on the real sector is missing and, thus, an important ingredient of the effect of insider trading on the firm is ignored. This point is also apparent when studying the effects of competition, with more than one trader, on the financial side of the firm, as was studied by Tighe (1989), (see also Holden & Subrahmanyam, 1992; Foster & Viswanathan, 1993).[1] In these cases the influence of the insider on the profitability of the firm is not studied, and, thus, the informational content of the real decisions of the firm and the financial aspects of the firm are also missing.

On the other hand, some recent work incorporates real, as well as financial sectors in their models of insider trading. Leland (1992), for instance, examines the effect of insider trading on real investment without explicitly modeling the role of the insider in linking real and financial decisions. Manove (1989) and Dow and Rahi (2003) also incorporate real and financial decisions but focus on the question of fairness rather than the relationship of the real and financial decisions. Finally, Ausubel (1990) studies real aspects of insider trading but without financial markets.

This relationship between the real and financial effects of insider trading was addressed in several papers by Jain and Mirman (2000, 2002). In Jain and Mirman (2000, henceforth JM) two basic changes to the Kyle model are made. The first is that the real sector of the economy is added, so that the insider can make real decisions of the firm as well as financial decisions. Second, the market makers can see two signals, a real signal and the order flow signal. The model is designed to yield a linear equilibrium so that the comparative statics are both simple and workable. In JM there is no competition either in the financial sector or the real sector. Competition in the real sector was added to this model in Jain and Mirman (2002, henceforth JMC, where "C" refers to "Cournot" due to the Cournot competition in the real sector). In these models the results of Kyle are shown to be altered by the insider's (the manager of the firm) ability to influence the real output and, thus, the profitability of the firm. This connection between the real and the financial decisions also has a profound effect on the information that is revealed by insider trading. Indeed, it is shown, in JM and JMC, that the amount of information incorporated in the stock price, which is the same in both papers, is greater than in Kyle (1985) and Rochet and Vila (1994), and, more importantly, it is a function of the variables of the model rather than a constant, as in Kyle.

Moreover, in JM and JMC, a compensation scheme for the manager (determined endogenously) was constructed to ensure the existence of linear equilibrium. In fact, there are two parts to the compensation of the manager. The first deals with compensation per share, since it depends on the output decisions of the manager and influences the per share profits of the firm. The second corresponds to a constant compensation, which is a constant times the trade of the manager and does not depend on the number of shares of the firm. The latter is used to influence the trading of the manager in the stock market. In order to align the interests of the firm, the coefficient of these two elements of the compensation of the manager must be set equal. This ensures that the second order condition of the manager is satisfied and, thus, yields a linear equilibrium, as in the Kyle model. Throughout the paper, the term "compensation scheme" refers to this coefficient. It is shown that the profits of the manager, as well as the compensation received by the manager in JMC, are less than in JM.

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[1] For more details on this literature, see O'Hara (1995).