Research in Economics 68 (2014) 324–337

Contents lists available at ScienceDirect

Research in Economics

journal homepage: www.elsevier.com/locate/rie

Incentives and managerial effort under competitive pressure: An experiment

Ahmed Ennasri[a,b,1], Marc Willinger[b,*]

[a] BEAR Lab, Université Internationale de Rabat, Rabat Business School, Technopolis – Rocade de Rabat-Salé, 11000 Salé El Jadida, Morocco
[b] LAMETA, Université de Montpellier 1, Av. Raymond DUGRAND, C.S. 79606, 34960 MONTPELLIER Cedex 2, France

ARTICLE INFO

Article history:
Received 8 June 2013
Accepted 28 September 2014
Available online 7 October 2014

Keywords:
Incentives
Managerial effort
Competition
Moral hazard
Experiments

ABSTRACT

We investigate how increased competition affects firm owners' incentives and managers' efforts in a laboratory experiment. Each owner offers a compensation scheme to his manager in two different conditions: under monopoly and under Cournot duopoly. Following acceptance of the compensation, the manager chooses an effort level to increase the probability of a cost-reduction which affects the firm's profit. According to standard theoretical predictions the entry of a rival firm in a monopolistic industry affects negatively both the incentive compensation and the effort level. Our experimental findings show that the entry of a rival firm has two effects on managerial effort: an *internalization effect* which affects positively the level of effort and an *income effect* which has a negative impact on effort. The combined outcome of these two effects is neutral with respect to managerial effort: we observe that when competition reduces the firm's profit, the owner reacts by offering lower incentives but despite the lower incentives the manager still accepts the contract offer and exerts the same level of effort than under the monopoly condition.

1. Introduction

The impact of competition on incentives to provide managerial effort is a key issue both for theory and for business practice. The underlying question is: which are the optimum incentives in a context where firms compete? The answer rests on a clear understanding of the manager's reactions to an alteration of the incentives provided by the firm's owner in reaction to increased competition.

The empirical literature on the relationships between competition, incentives and managerial effort is rather scarce because of the methodological difficulties to establish such links empirically. In their seminal paper Jensen and Meckling (1976) found a weak correlation between the manager's compensation scheme and the firm's performance. However, Hall and Liebman (1998) found a strong and positive correlation between firms’ performance and managers' compensation. A few papers (Nickell, 1996; Cuñat and Guadalupe, 2005; Baggs and De Bettignies, 2007; Beiner et al., 2011), studied the effect of competition. These papers focused on the impact on incentives, productivity or agency costs. Their main findings can be summarized as follows: increasing competition on the product market has a positive effect on employees'

* Corresponding author. Tel.: +33 467 15 83 09; fax: +33 467 15 84 67.
E-mail addresses: ahmed.ennasri@uir.ac.ma (A. Ennasri), willinger@lameta.univ-montp1.fr (M. Willinger).
[1] Tel.: +212 530 10 30 63.

http://dx.doi.org/10.1016/j.rie.2014.09.002
1090-9443/

productivity (Nickell, 1996), on managers' incentives (Cuñat and Guadalupe, 2005; Beiner et al., 2011) and a negative effect on agency costs (Jagannathan and Srinivasan, 1999; Baggs and De Bettignies, 2007).

However, all these studies suffer from serious weaknesses because of methodological limitations. First, there is a difficulty in observing, and therefore measuring, changes in the competitive pressure of a firm and in its level of managerial effort. Even if the variation of competitive pressure could be properly isolated, data on incentives and efforts are generally unavailable because managers' efforts are typically unobservable. Second, each of the mentioned paper focused on a specific variable which might possibly be affected by competition (incentives, effort or agency costs) precluding thereby a global assessment of the impact of increased competition on the relations between these variables.

Controlled laboratory experiments represent a powerful tool to overcome some of the limitations encountered by empirical studies. For instance, they allow the researcher to produce the relevant type of data that is needed for answering clearly the research question that is at stakes. Of course, laboratory experiments have their own limitations compared to other empirical methods. One of them is the availability of a relevant subject pool. Standard subjects (i.e. students) often behave differently from the targeted population or from the general population (see e.g. Cooper et al., 1999; Fehr and List, 2004; Alevy et al., 2006; Croson and Gneezy, 2009; Alatas et al., 2008; Bortolotti et al., 2013). Although subject pool effects represent a serious concern, most of the researchers just cited also acknowledge that laboratory experiments are useful because they allow to control for many confounding factors that affect natural data. Furthermore, in some cases, field experiments allow to consider other subject-pools, that are better targeted with respect to the research question.

In this paper we report experimental data that was gathered in a controlled environment that allowed us to observe precisely and without ambiguity whether and how the level of profit of a firm is related to the incentive scheme offered by the firm's owner and how these incentives affect the manager's effort choice. We consider the most simple case of increased competition by comparing a monopolistic and a duopolistic industry. After the entry of a new firm in the formerly monopolistic industry, competition *à la Cournot* arises between two agencies. The monopoly is taken as a benchmark because it corresponds to the standard case for which the intra-firm managerial incentives problem is isolated with respect to the market pressures. In the symmetric duopoly industry two (identical) firms compete in the product market. The two principal are aware that they are simultaneously offering an incentive scheme to their manager. The managers' task is to provide a level of effort which determines the probability of a cost-reducing innovation. Efforts are unobservable by principals. Because their managers' effort cannot be rewarded, principals condition their incentives offers on the level of realized profit. The model predicts the optimal incentives for the two market structures (monopoly and duopoly) and the corresponding effort levels.

Our experimental design implements the competing agency problem described above in a parcimonious way. We rely on a within-subject design that allows us to study how managerial incentives of the (former) monopoly firm are adjusted after a second firm has entered into the industry. In a first sequence the firm has no rival and we can therefore observe the principals' contract offers and the managers' effort choices without competition. In a second sequence the entry of a second firm in the industry challenges the monopolists' profits who expect a lower level of profit compared to their former (monopolistic) profit. We observe how principals react by adjusting the incentives provided to their managers and how the latter respond by adjusting their levels of effort. We control for order effects by running a second treatment where the ordering of sequences is reversed.

Our main findings are as follows: duopoly firms offer lower incentives compared to monopolistic firms, but managers accept the less attractive contract offers of the duopoly firms and maintain their effort level despite the reduced incentives. These findings which exhibit a positive relation between expected profit and managerial incentives are in accordance with some of the theoretical literature (Hermalin, 1992; Schmidt, 1997). However, in contrast to the theoretical predictions, the relation between incentives and effort is not always positive. Moving from a monopoly situation to a duopoly situation which lowers the firm's expected profit because of competition, leads principals to provide lower incentives. But managers accept such contracts and maintain their former effort level.

We interpret our findings as follows. Increased competition has two effects on managerial effort: an *internalization effect* and an *income effect*. According to the *internalization effect* managers internalize the competitive pressure by providing higher effort to preserve the competitiveness of the firm. The firm can therefore implement a higher effort level at a lower cost. According to the *income effect* competition reduces the firm's expected profit and therefore the owner lowers the incentives and the manager lowers his level of effort. The *internalization effect* and the *income effect* cancel out on average.

The remainder of the paper is organized as follows. In Section 2 we state our main theoretical predictions. In Section 3 we describe our experimental design. Results are presented and discussed in Section 4. Section 5 concludes.

2. Theoretical background

In this section we introduce the theoretical framework on which we built the design of our experiment. We rely on a simple model that allows us to compare managerial incentives and efforts under monopolistic and competitive market structures. We restrict the analysis to the comparison of such incentives between a monopolistic firm and a Cournot duopoly on the product market. Before we introduce our model, we offer a brief review of the relevant theoretical literature.