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Market efficiency, managerial compensation, and real efficiency[☆]

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ABSTRACT

We examine how an exogenous improvement in market efficiency, which allows the stock market to obtain more precise information about the firm's intrinsic value, affects the shareholder–manager contracting problem, managerial incentives, and shareholder value. A key assumption in the model is that stock market investors do not observe the manager's pay-performance sensitivity *ex ante*. We show that an increase in market efficiency weakens managerial incentives by making the firm's stock price less sensitive to the firm's current performance. The impact on real efficiency and shareholder value varies depending on the composition of the firm's intrinsic value.

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1. Introduction

Understanding the real effects of stock market prices has been of long-standing concern to financial economists.² One important channel through which stock market prices may affect investment decisions is that decision makers within firms are often party to contracts that are contingent on secondary market prices. This is particularly true for managers whose compensation is often directly tied to their firm's share price. Moreover, shareholders who choose the managers' compensation contracts may themselves care for the firm's share price in order to preserve liquidity and to prevent dilution of their ownership stakes. Therefore, the shareholders' choice of compensation contracts and the managers' investment decisions could be affected by the manner in which the stock market aggregates information to determine prices. In this paper, we examine how an exogenous improvement in market efficiency, which allows the stock market to obtain more precise information about the firm's intrinsic value, affects the shareholder–manager contracting problem, managerial incentives, and shareholder value.

To fix ideas, it is helpful to consider a start-up firm that plans to undertake an IPO in the near future. The firm's intrinsic value consists of two components: a “managerial value added” (MVA) component that depends on the effort exerted by the current management to exploit the firm's technology or product market power, and a “core productivity” (CP) component that is independent of current effort and depends on the firm's innate productivity. The stock market prices the firm by aggregating two information signals: a noisy signal on the firm's current performance which is affected by the manager's effort (“performance

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² See Bond et al. (2012) for a survey of this literature.

signal”), and a noisy signal on the firm’s underlying productivity that is independent of the manager’s effort (“productivity signal”). As the productivity signal cannot be influenced by the manager’s effort, an increase in the precision of this signal allows the stock market to obtain a better forecast of firm value. Hence, we interpret the precision of the productivity signal as our measure of market efficiency.

We assume that the shareholders of the firm care for the firm’s market value apart from its long-term intrinsic value. Hence, they have an incentive to influence the stock market’s inference of the firm’s productivity. A key assumption in our model that distinguishes it from earlier studies on the real implications of market efficiency (e.g., see Paul (1992)) is that the stock market does not observe the manager’s pay-performance sensitivity *ex ante*, and hence, cannot infer the manager’s true incentives.³ Thus, shareholders may surreptitiously provide the manager with high-powered incentives in a bid to boost the performance signal. We believe that this is a realistic assumption because the contract between top executives and their firm may largely be an implicit, self-enforcing one. SEC rules only require firms to disclose their executive compensation policy in broad terms. Although firms are required to disclose stock and option grants *after the fact*, there is no requirement to precisely disclose the performance targets that would trigger fresh grants.⁴ However, knowing the actual payment made to an agent is not the same as knowing the rule by which the compensation was calculated, and it does not allow one to infer what the agent’s incentives are *ex ante* (Katz, 1991).

To illustrate the importance of non-observability of compensation contracts, we first analyze a benchmark equilibrium in which the stock market could observe the manager’s pay-performance sensitivity. In this benchmark setting, we show that an increase in market efficiency, resulting from an increase in the precision of the productivity signal, unambiguously lowers real efficiency, and decreases shareholder value. Surprising as this may seem, this stark result is actually a reiteration of the key result in Paul (1992), who shows that improvement in market efficiency may worsen real efficiency, because the signals that are most informative about firm value may not be very informative about the manager’s effort. In our model, as market efficiency improves, the stock market attaches more weight to the productivity signal and less weight to the performance signal, which is affected by the manager’s effort. Thus, all else equal, an increase in market efficiency weakens managerial incentives and increases the cost to shareholders of providing incentives to the manager, because the manager will exert a lower effort for the same level of incentive compensation as before. In equilibrium, shareholders respond to an increase in market efficiency by lowering the manager’s pay-performance sensitivity, the manager exerts lower effort, and shareholder value decreases.

In a more realistic setting where the stock market does not observe the manager’s pay-performance sensitivity, we find that the impact of enhanced market efficiency on real efficiency and shareholder value is more nuanced, and depends on the composition of the firm’s intrinsic value. Specifically, we find that an improvement in market efficiency increases shareholder value in firms where a larger part of the firm’s intrinsic value comes from the CP component (“high-CP” firms), that is unrelated to current effort. On the other hand, an improvement in market efficiency decreases shareholder value in firms where the intrinsic value largely comprises the MVA component (“low-CP” firms). In other words, an improvement in market efficiency benefits firms whose current performance is not a good measure of their intrinsic value, but is detrimental for firms whose current performance is a good measure of their intrinsic value.

To understand the intuition for this surprising result, note that the real inefficiency in our model arises because the stock market does not observe the manager’s actual effort or pay-performance sensitivity, and prices the firm based on a *fixed* conjecture of the manager’s effort. The manager’s actual effort affects the stock market’s inference of the firm’s productivity. Given their desire for a higher stock price, the firm’s shareholders have an incentive to induce a higher than efficient level of effort (by providing the manager with high-powered incentives) in a bid to positively influence the stock market’s assessment of the firm’s productivity.⁵ Moreover, the shareholders’ incentive to induce overinvestment in effort increases with the relative size of the CP component, because a larger CP component amplifies the effect of the manager’s effort on the market’s inference. Thus, in equilibrium, shareholders of high-CP firms induce overinvestment in effort, whereas shareholders of low-CP firms induce underinvestment in effort.

Given this differential nature of the investment distortion, an increase in market efficiency has a differential impact on real efficiency and shareholder value depending on the relative size of the CP component. Consider high-CP firms whose shareholders are more likely to induce overinvestment in effort. By making it costlier for shareholders to provide incentives to their managers, an increase in market efficiency corrects this overinvestment problem, and improves shareholder value. By a similar logic, however, an increase in market efficiency worsens the underinvestment problem of low-CP firms, and destroys shareholder value.

Although we have described a firm raising capital in the primary market, our model is valid for any firm with the following key features, which we believe are quite general: First, the welfare of the firm’s shareholders (the principals) significantly depends on the firm’s stock price. Second, stock price is the primary mechanism through which the firm’s shareholders provide incentives to the firm’s manager. This is because the manager’s tenure is significantly shorter than that of his investment, and any short-term performance measures (burn-rate, investment in R&D, revenues, and operating profits) may be both manipulable and largely

³ This is equivalent to assuming that shareholders may privately renegotiate the manager’s compensation contract or offer the manager uncontracted side payments.

⁴ The SEC rules on disclosure of executive compensation state that “... companies are not required to disclose target levels with respect to specific quantitative or qualitative performance-related factors considered by the compensation committee or the board of directors, or any other factors or criteria involving confidential trade secrets or confidential commercial or financial information, the disclosure of which would result in competitive harm to the company.”

⁵ The shareholders’ incentives are similar to those studied in the signal-jamming literature (e.g., Fudenberg and Tirole (1986), Stein (1988) and Stein (1989)).

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