



# When is public enforcement of insider trading regulations effective?

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## ABSTRACT

In this paper we investigate when public enforcement of insider trading regulations reduces the amount of insider trading. We model a game between a potentially self-interested regulator enforcing insider trading laws and a trader who may be trading on inside information. We show that equilibrium strategies exist where despite active enforcement all inside information is used. Furthermore, we find that increased disclosure in order to reduce the amount of inside information does not necessarily lead to less insider trading as insiders may more frequently use their information. Increased disclosure decreases the contribution of public enforcement to reducing insider trading. We also show that improvements in the risk analysis system used by the regulator for monitoring purposes may prompt more insider trading. The results yield policy implications, contribute to explaining empirical observations, and suggest possible directions for future empirical research into the relationship between enforcement and the cost of equity.

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## 1. Introduction

There is an ongoing debate whether public enforcement of insider trading regulations benefits stock markets. Whereas economic modeling of insider trading law enforcement (see [DeMarzo, Fishman, & Hagerty, 1998](#)) does not explain the presence of enforcement without benefits for investors, empirical evidence on the contribution of public enforcement is mixed. [Bhattacharya and Daouk \(2002\)](#) show that enforcement of insider trading laws decreases cost of equity, but, on the other hand, [La Porta, Lopez-De-Silanes, and Shleifer \(2006\)](#) find little evidence that public enforcement benefits shareholders.

In this paper we contribute to this debate by studying insider trading law compliance in a general game-theoretic setting to investigate the effectiveness of different tools in reducing insider trading. Contrary to [DeMarzo et al. \(1998\)](#), we model the regulator as having a private interest instead of only a public interest, i.e., we allow for benefits like politics and career concerns. Furthermore, we separate different elements in the legal setting, which allows us to study the effect of the conviction rate, the effectiveness of investigations, the risk analysis system of the regulator that flags suspicious trades, and disclosure requirements on the

amount of insider trading, as well as the interactions between these elements. The results of our model contribute to explaining some current empirical observations, suggest possible directions for further empirical research, and yield insight in the effectiveness of different means to reduce insider trading which may, following the theoretical reasoning in [Akerlof \(1970\)](#) and [Manove \(1989\)](#), in turn reduce cost of equity.

With respect to explaining empirical results, we first of all show that there are equilibrium strategies in which the regulator has no credible threat to audit which may contribute to explaining the observation that not all laws are actively enforced ([Bhattacharya & Daouk, 2002](#)). Second, there are equilibrium strategies with high enforcement rates but without any effect on the amount of insider trading, which may partly explain the result found in [La Porta et al. \(2006\)](#) that public enforcement hardly benefits shareholders. In line with this we show that tighter disclosure requirements indeed reduce the contribution of public enforcement to the reduction of insider trading. Third, we show how a low conviction rate may render public enforcement to be ineffective. This is in line with [Linciano \(2003\)](#) who argues that in Italy the low conviction rate results in low expected penalties causing enforcement to be ineffective.

For future empirical research, the model suggests that the expected penalties moderate the effect of enforcement on cost of equity. More precisely, whereas some current research takes the presence of enforcement as a dummy variable (e.g., [Beny, 2005](#); [Bhattacharya & Daouk, 2002](#); [Fernandes & Ferreira, 2009](#)), our

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model suggests that insider trading is not reduced in situations where there is enforcement but the expected penalties are low. We also show that in case there is enforcement, low enforcement rates may very well co-exist with a low level of insider trading. The relation between enforcement activity and cost of equity may therefore be negative. Finally, as disclosure requirements and public enforcement of insider trading laws appear to be substitutes, disclosure requirements are also expected to moderate the effect of public enforcement on cost of equity.

We show how the amount of insider trading depends on several parameters in our model, the first being the conviction rate. The insider-trading legislation of most European Union countries requires inside information to be precise in order to be found guilty on insider trading (see, e.g., [Maug, 2002](#)). This can result in many cases where trading on private information cannot be classified as inside information, which may result in low effective conviction rates (see, e.g., [Linciano, 2003](#)) and increases the probability of ending up in equilibria with little reduction in insider trading.

We also find that a better risk analysis system is not always preferable. When system quality is not very reliable, implying that regulators have to look at the full range of trades rather than only at the subset of trades that have been flagged as high-risk, marginal improvements in the quality of the system make the degree of insider trading increase. The reason is that traders bet on the relatively large probability of not being signaled and are not deterred by the certain audit in case the system highlights them. An increase in the quality of the system then reduces the audit probability when the trade is not signaled as high risk. Traders will keep betting on system inefficiency until improvements in the risk analysis system make it so reliable that only trades with positive signals are audited at which point the use of inside information will fall off.

The final effect we mention is that of increased prevention. One way to control trading on insider information is to tighten disclosure rules and thereby reduce the amount of inside information in the market. We find that such an approach reduces the effectiveness of enforcement. While increased disclosure may reduce the amount of insider trading in cases where enforcement of insider trading regulation is ineffective, when cost-effective auditing techniques and efficacious penalties are in place, a reduction in the amount of inside information does not reduce further the amount of insider trading. This is because enforcement becomes less effective. Therefore, it is questionable whether reducing insider trading is a valid argument for increased disclosure when repression is effective.

We illustrate these effects in a rather general model that is applied to the problem of insider trading. Our model may therefore contribute to the literature on enforcing regulations in other regulatory areas by modeling a system that uses information from monitoring functions to flag items for investigation, as is common in practice.

The remainder of this paper is organized as follows. The next section provides a brief overview of related research. Section 3 describes the model, and Section 4 presents the resulting optimal equilibrium strategies. In Section 5 we analyze the results. We discuss the sensitivity analysis of the parameters, and the empirical as well as the economic and legal implications. Section 6 presents our conclusions. All proofs are in [Appendix](#).

## 2. Related literature

There is an extensive literature on insider trading in law, economics, finance and politics. While we do not present an exhaustive overview of that literature, we do highlight some important results from related work.

Let us start with some of the research on economic theories of whether insider trading should be prohibited. [Manne \(1966\)](#) developed one of the first of these theories. He argues that insider trading is efficient because managers are compensated in part by the personal gains they obtain through insider trading, lowering the cost of compensation. Also, price changes due to insider trades can be informative. Later theorists, including [Manove \(1989\)](#), [Fishman and Hagerty \(1992\)](#) and [Bebchuk and Fershtman \(1994\)](#), drew the opposite conclusion, especially when analyzing the effects of insider trading on the cost of capital, and thereby on investment decisions. [Ausubel \(1990\)](#) showed that insider trading laws can be Pareto-optimal: insiders may benefit if they precommit not to trade based on inside information, which can be realized through government regulation. There are valid arguments both in favor of insider trading laws and against it. We do follow up on the view that insider trading is costly as it increases cost of equity. The benefits of insider trading for the market are expected to be limited especially when the inside information will become known eventually and when this is thus a kind of foreknowledge ([Manove, 1989](#)).

Empirical evidence on the effects of enforcement of insider trading laws is also ambiguous. In one of the first empirical studies of the effect of insider trading regulation, [Jaffe \(1974\)](#) found no evidence of a change in insider trading following three important rulings on insider trading. [Seyhun \(1992\)](#) finds evidence that new statutes enacted in the U.S. in the 1980s, as well as the increased statutory sanctions had no additional deterrent effects on insider trading. Case law however did affect trading behavior. [Linciano \(2003\)](#) find results that cause doubts on whether insider trading regulation is effective in Italy. Theories that support insider trading regulation are primarily based on the notion that a reduction in insider trading can increase the efficiency of capital allocation and reduce the cost of equity. Theory suggests that regulation of insider trading may reduce the adverse selection problem that arises from information asymmetry. This results in reduced estimation risk and therefore a lower cost of capital ([Akerlof, 1970](#)). Several researchers have tested these premises. [Easley and O'Hara \(2004\)](#) found that investors demand a higher return to hold stocks when they believe that there are informed investors who have an advantage and that this results in higher capital costs for firms. On the other hand, [Bris \(2005\)](#) finds in his study of a large number of acquisitions that insider trading regulation fails to eliminate profits made by insiders and makes acquisitions more expensive. Other studies of the impact of various kinds of insider trading regulation in different countries, however, show that enforcement has a significant effect on stock prices. First, [Bhattacharya and Daouk \(2002\)](#) show that while the introduction of insider trading regulation has no appreciable effect on the cost of equity in a country, cost of equity does decrease significantly following the first prosecution. [Beny \(2005\)](#) builds on that study investigating whether differences in specific aspects of regulation of countries' insider trading laws result in differences in the structure and performance of stock markets. By adding additional insider trading regulation and enforcement variables, [Beny \(2005\)](#) shows that 'countries with more prohibitive insider trading laws have *more diffuse* equity ownership, *more accurate* stock prices, and *more liquid* stock markets' (p. 144). [Fernandes and Ferreira \(2009\)](#) show that in developed countries informativeness of stock prices increases after the first-time enforcement of insider trading regulations. [La Porta et al. \(2006\)](#) investigate the effectiveness of different features of securities regulation, and while they find little evidence that enforcement by regulatory authorities, i.e., public enforcement, benefits shareholders, they do find strong evidence that rules that mandate disclosure and facilitate private enforcement, i.e., lawsuits, do.

Related to this paper is the question who should enforce public regulations and how. [Polinsky and Shavell \(2000\)](#) study the economic theory of enforcement in a general setting and focus on

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