

Monitoring Effects and Signaling Effects of Independent Director Appointments: Voluntary and Mandatory Appointments

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Abstract

This paper provides a model of the decision to appoint independent directors in a market with integrity information asymmetry and includes a decomposition of the price effects of both voluntary and mandatory appointments, using an analysis of the optimal behaviors of honest and dishonest entrepreneurs. Specifically, an honest (dishonest) entrepreneur might voluntarily appoint (not appoint) independent directors to signal (fake) his integrity to the market in order to maximize his wealth. In Taiwan, the co-existing regulations of mandatory and voluntary appointments of independent directors offer a unique opportunity to gain further insight into the signaling hypothesis and the monitoring hypothesis. The empirical test shows that the significant differences of abnormal returns between the voluntary and mandatory samples are in line with the signaling effect.

Keywords: *independent director; monitoring effect; signaling effect*

JEL classifications: *G00, G30, G38*

1. Introduction

After a wave of management scandals sweep over domestic and international stock markets, lawmakers immediately enact codes to improve corporate governance standards. The most effective defense system is the incorporation of surveillance mechanisms into these guidelines. The monitoring job of the board of directors is considered to be the first line of defense against embezzlement by management. Therefore, appointments of independent directors, who can oversee corporate entrepreneurs, are often used as a device to increase the monitoring function of the board. In the literature, many researchers claim that the agency problem between entrepreneurs and shareholders is the main cause of such financial corruption, and that independent directors are the most important monitors to control this agency problem. However, firms decide any financial policy by considering not only its substantial function, but also its signaling implications to the market. Firms might announce the appointments of independent directors to signal a stock price that is undervalued due to integrity information asymmetry. Appointments of independent directors not only exist for their monitoring effect but also for their signaling effect. This model serves as a first attempt to simultaneously incorporate the signaling effect and the monitoring effect in analyzing the decision to appoint independent directors.

The traditional view holds that outside independent directors have substantial monitoring activities that protect the firm's assets.¹ These activities are sufficiently substantial to deter dishonest behavior on the part of independent directors. Another aspect of the firm's choice of outside independent directors involves signaling. A firm that seeks to communicate that its business operation is indeed "clean" and "efficient" might engage the services of an outside independent director with a strong reputation. The theory stipulates that a dishonest entrepreneur who obtains private benefits from the firm would have no incentive to appoint such an outside director. Therefore, the choice of outside independent directors in and of itself sends a strong signal to investors. The appointments of independent directors bring investors both monitoring and signaling value.

A major component of theoretical explanations for financial policy is information

¹ Fama (1980) and Fama and Jensen (1983) argue that the outside directors perform their monitoring role better than their inside counterparts. Bhagat et.al. (1987) suggest that the interest of shareholders is better looked after by outside directors than by inside directors; they are motivated to fulfill their duties because of a desire to maintain their reputations and a fear of shareholder actions such as lawsuits if they fail to monitor the behavior of entrepreneurs.

asymmetry.² Entrepreneurs are insiders, and are likely to know more about the current and future prospects of the firm than outsiders. Changes in corporate financial policy may reveal some information to outsiders about the value of the corporation. Moreover, insiders may even use such policy to deliberately manage the market's perception of the firm's value. Following a series of financial scandals, while the market can see that a firm does not execute some activities of corporate governance - for example, appointments of independent directors - it can tell that entrepreneurs reject establishing monitoring mechanisms because of dishonesty. If honest firms decide to signal their integrity to the market by appointing independent directors, they could distinguish themselves from dishonest firms who cannot appoint outside directors as easily.

According to the theory of signaling, financial decisions are a means of passing information from entrepreneurs to shareholders. By announcing the appointment of independent directors, a company intends to reduce the integrity information asymmetry, which exists between entrepreneurs and shareholders. The advantage of this form of information diffusion is that it is more plausible than road shows or press releases: if the signal proves to be wrong, the company is punished with an unusually low stock price because of the entrepreneurs' deceit. Hence, a consequence of appointing independent directors will be much increased attention from the media and investors. This limelight is believed to boost stock price because it effectively signals integrity. When firms cannot credibly communicate their integrity to the market, how does the entrepreneur's honesty translate into market value? Appointing independent directors is a good way to signal to the market.

This model of independent director appointment strategy is derived assuming that entrepreneurs will maximize wealth, and that the market recognizes that appointments of independent directors not only bring monitoring of the entrepreneurs but also signal entrepreneurs' integrity. We find that the size of the market price reaction to the voluntary appointment of independent directors is a function of the signaling effect, the monitoring effect, and the monitoring cost, yet the size of the market price reaction to mandatory appointment is a function only of the monitoring effect and the monitoring cost. An honest entrepreneur will appoint independent directors to signal his integrity. However, a dishonest entrepreneur is not likely to do so unless the appointment of independent directors could exploit the signaling value

² The notion that financial decisions convey information about the firm value was proposed by Leland and Pyle (1977) and Bhattacharya (1979) in adaptations of the Spence (1973) signaling model. Akerlof (1970) offers a signaling model.

and the related monitoring activities only slightly depriving him of private benefit.

Extant empirical research only explores the link between the reduction of agency problems and the monitoring values of appointing independent directors. Rosenstein and Wyatt (1990), using outside director announcements of U.S. firms, found significant positive excess returns with respect to the announcements but with only 0.13% cumulative abnormal returns. Hossain et al. (2001) find that the fraction of outside directors on New Zealand boards has a significant positive influence on company performance. The appointment of outside directors may be seen as a value enhancing action by New Zealand investors. However, Lin et al. (2003) found that the market reaction was insignificant based on a sample of appointment announcements made by UK firms. Those contradictory results await exploration.

In the literature, many researchers suggest that there are many theories to explain stock market reactions stemming from changes in corporate financial policies. Nevertheless, researchers often could not analyze the multiple effects of those issues in their empirical tests because of inherent obstacles of empirical design. In Taiwan, there is both a mandatory appointment code for independent directors, which was imposed on all newly listed firms in the Taiwan Stock Exchange and in the Taiwan OTC stock market after February 2002, and a voluntary appointment code, which was suggested for all firms listed prior to that date. The boards of newly listed firms underwent dramatic structural change in response to widespread concerns about the lack of managerial accountability.

Fortunately, Taiwan's regulatory environment offers a unique opportunity to gain further insight into the signaling hypothesis of independent director appointments. This situation allows us to distinguish between the voluntary appointments of independent directors that are intended to signal a permanent increase in stock value and to provide monitoring value, and the mandatory appointments that are merely a reaction to a change of law and have only monitoring value.

Similar to Lin et al. (2003) and Rosenstein and Wyatt (1990), we examine the stock market reaction to the announcement of outside director appointments for insight into whether appointing independent monitors could reduce the agency problem between entrepreneurs and shareholders. However, in contrast to Lin et al. (2003) who focus on the monitoring value of outside directors being conditional on the extent of the firm's agency problem, these tests emphasize the signaling effects of appointing independent directors.

Furthermore, this approach could isolate the signaling effect from the monitoring effect by its empirical design. The empirical result reflects the belief that the

significant differences of abnormal return between the two samples (voluntary and mandatory appointments) is in line with the signaling hypothesis that the appointment of independent directors is a way to send positive signals to the stock market. Besides, the insignificant monitoring effect of mandatory samples is in accordance with Lin et al. (2003).

Section 2 explains the analytical framework and derives the differential equation system characterizing our equilibrium. Section 3 develops the empirical model. Section 4 presents the empirical results. Section 5 concludes the paper.

2. A Simple Model of Independent Director Appointments

2.1. The Analytical Framework

In keeping with a “carrot and stick” framework, an incentive mechanism designed by a corporation’s board of directors needs to insure that the executive compensation is enough to attract and retain talented managers, and that the monitoring function serves to align the interests of managers with shareholders. Traditionally, the efficacy of the monitoring role of the incentive mechanism lies at the heart of the literature related to corporate governance. However, regarding the monitoring mechanism of appointing independent directors, we suggest that a firm is likely to deliberately manage this surveillance policy to change the market’s perception of the firm’s value.

In this sub-section, we present an analytical framework to assess an entrepreneur’s decision to appoint independent directors under integrity information asymmetry. Four assumptions are made to restrict the behaviors of the participants: 1) an honest entrepreneur (denoted by h) is a risk-neutral wealth maximizer restricted by the ethical condition that the shareholders’ interests are his top priority; 2) a dishonest entrepreneur (denoted by d) is a risk-neutral wealth maximizer, whose personal interests surpass the shareholders’ (clearly, the management of a dishonest entrepreneur will create a severe agency problem); 3) all rational and risk-neutral investors access public information only to trade in a market where entrepreneurs have information advantages about integrity, such that investors could not distinguish between an honest entrepreneur and a dishonest entrepreneur, so they recognize the conditional probability of an honest firm as $p(h/\Omega)$ and the conditional probability of a dishonest firm as $p(d/\Omega) (=1-p(h/\Omega))$ according to the current public information set Ω ; 4) it is assumed that a qualified independent director could passively monitor just to comply with the law or could aggressively monitor to

substantially reduce the private benefit of management. A firm may refer to market perception to appoint an independent director with high fees who not only has a strong reputation but also executes aggressive monitoring activities in order to magnify the signaling effect. The magnitude of those directors' salaries, D , depends on the activities of their monitoring job - passive or aggressive - or on their reputations.

In the first stage, the entrepreneur faces a decision to execute two mutually exclusive long-term projects. Those projects generate some verifiable income or profit. The outcome may be a success (yielding income $R > 0$) or a failure (yielding no income). The first project, H , has higher profits, R_H , with a higher probability of success, p_H . The second project, L , has lower profits, R_L , with a lower probability of success, p_L . However, if an entrepreneur invests in project L , he can gain a private benefit, B . The monitoring activities of independent directors can bring the private benefit down from B to βB . Those monitors can reduce the moral hazard by preventing the most egregious forms of dishonest activities. The monitoring value of appointing an independent director $(1 - \beta)B$ depends on the activities or reputation of the independent director, whose incentive is his salary, D . Hence, there exists a positive link between monitoring value and independent director compensation.

The fair valuation, P_x , of honest and dishonest firms are, respectively, $P_H (= p_H R_H)$ and $P_L (= p_L R_L - B)$, with $P_H > P_L$. In the long term, an efficient market will assign these fair valuations to these firms. However, in the short term, the market has to estimate the valuations, since the market cannot observe whether a firm is managed by an honest entrepreneur (H firm) or a dishonest entrepreneur (L firm). It can only see whether the firm has appointed independent directors.

With asymmetric information, the stock market cannot tell who is honest. What would happen when the level of information asymmetry is reduced? This model predicts that when the event V occurs, when a firm volunteers to appoint independent directors, it reveals itself as honest to the market, so the market increases the conditional probability of the honest firm to $p(h/\Omega, V)$, and decreases the conditional probability of the dishonest firm to $p(d/\Omega, V) (= 1 - p(h/\Omega, V))$ conditional on the appointment of independent directors, V . Conversely, in the event RV that a firm rejects the appointment of independent directors, it reveals itself as dishonest to the market, so the market decreases the conditional probability of the honest firm to $p(h/\Omega, RV)$, and increases the conditional probability of the dishonest firm to $p(d/\Omega, RV) (= 1 - p(h/\Omega, RV))$ conditional on the rejection of appointing independent directors, RV .

$$P_N = p(h/\Omega)p_H R_H + (1 - p(h/\Omega))(p_L R_L - B) \quad (1)$$

Accordingly, the related wealth of those entrepreneurs is, respectively:

Honest entrepreneur (h):

$$W_N^h = \alpha P_N = \alpha [p(h/\Omega)p_H R_H + (1 - p(h/\Omega))p_L R_L] - \alpha(1 - p(h/\Omega))B$$

Dishonest entrepreneur (d):

$$W_N^d = \alpha P_N + B = \alpha [p(h/\Omega)p_H R_H + (1 - p(h/\Omega))p_L R_L] + [1 - \alpha(1 - p(h/\Omega))]B$$

With information asymmetry, the relative wealth of the honest entrepreneur is lower than that of the dishonest entrepreneur. Consequently, integrity is harmful to an honest entrepreneur. Given a lack of outside monitoring, this principal-agent relationship creates a potential moral hazard problem. In practice, we can view other types of private benefits, like insufficient effort by the entrepreneur while enjoying external activities, overstaffing, overlooking internal controls, stealing from the firm, insider trading, receiving kickbacks from suppliers, and so on. Hence, a variety of private benefits exacerbate the agency problem while weakening entrepreneurial integrity.

2.2. Monitoring Effect and Signaling Effect

We now state several propositions that structure the differential equation system characterizing our equilibrium:

Proposition 1. *With mandatory appointment of independent directors, there is a positive (negative) market reaction to the appointment of independent directors, and thus the compensation of an honest entrepreneur increases (decreases) when the market's expected monitoring value exceeds (does not exceed) the monitoring cost. However, the compensation of a dishonest entrepreneur must shrink.*

After recent scandals, policymakers around the world have responded by creating codes to improve ethical standards in business. For example, the Taiwan Stock Exchange and the Taiwan OTC Securities Market enacted a code that requires that boards have more than two independent directors with no material relationships to the company. The code was imposed on all firms newly listed after February 2002.³

³ See Article 9 of Taiwan Stock Exchange Corporation Criteria for Review of Securities Listings.

The rationale for this policy is that board members with close business relationships with the company or personal ties with high-ranking officers may not dispassionately assess the entrepreneurs' performance, or may have vested interests in the firm's practices.

Since this mandatory appointment of independent directors is in accordance with the required minimum monitoring activities for newly listed firms, its passive monitoring function could be extremely ineffective, as monitors have very limited information and power. While independent board members are independent in their scrutiny, they have much less information than insiders. However, the mandatory appointment would be somewhat beneficial for a firm in which the entrepreneur is likely to be intentionally dishonest because the outside monitoring activities – however passive - could partially limit the entrepreneur's dishonest activities. Thus the dishonest entrepreneur's private benefit reduces to βB . Investors still could not discern the entrepreneur's integrity, when a firm appoints mandatory independent directors, so the conditional probability of honest and dishonest entrepreneurs does not change. The market price is (Let M denote mandatory appointment):

$$P_M = p(h/\Omega)[p_H R_H - D] + (1 - p(h/\Omega))[p_L R_L - \beta B - D] \quad (2)$$

Comparing this with no monitoring, we can derive the price effect of mandatory independent director appointments as $P_M - P_N$:

$$P_M - P_N = (1 - p(h/\Omega))(1 - \beta)B - D \quad (3)$$

$$\text{if } (1 - p(h/\Omega))(1 - \beta)B \geq D \Rightarrow P_M - P_N \geq 0$$

$$\text{if } (1 - p(h/\Omega))(1 - \beta)B \leq D \Rightarrow P_M - P_N \leq 0$$

The first term of the right hand side (3) implies that investors expect the monitoring value of mandatory appointments to be the monitoring effect. Thus, if this expected monitoring value exceeds (does not exceed) the monitoring cost D , the market price increases (decreases). As discussed, the monitoring value of appointing an independent director $(1 - \beta)B$ depends on the activities or reputations of the independent directors, who are motivated by salary, D . Accordingly, the wealth of the two types of entrepreneurs is respectively:

Honest entrepreneur (h):

$$W_M^h = \alpha P_M = W_N^h + \alpha(1 - p(H/\Omega))(1 - \beta)B - \alpha D$$

if $(1 - p(h/\Omega))(1 - \beta)B \geq D$

\Rightarrow The compensation of the honest entrepreneur is increasing.

if $(1 - p(h/\Omega))(1 - \beta)B \leq D$

\Rightarrow The compensation of the honest entrepreneur is decreasing.

Dishonest entrepreneur (d):

$$W_M^d = \alpha P_M + \beta B = W_N^d - [1 - \alpha(1 - p(h/\Omega))](1 - \beta)B - \alpha D$$

$$- [1 - \alpha(1 - p(h/\Omega))](1 - \beta)B - \alpha D \leq 0$$

\Rightarrow The compensation of the dishonest entrepreneur is decreasing.

We find that the compensation of the honest entrepreneur is increasing (decreasing) when the market's expected monitoring value exceeds (does not exceed) the monitoring cost. Hence, the equity incentive could align the interest of the honest entrepreneur with that of investors. For a dishonest entrepreneur, the mandatory appointment of independent directors is substantially detrimental to his wealth.

Despite having mandatory appointment of independent directors, if the entrepreneur has a chance to adjust his project strategy, a dishonest entrepreneur will not change his strategy in that the payoff of project L , $\alpha P_M + \beta B$, is higher than the payoff of project H , αP_M . Besides, the appointment is not necessary for the honest entrepreneur, who still takes the shareholders' side, so the compensation of independent directors is an additional expense for the firm. However, from the investors' point of view, the code is effective as long as the expected monitoring value is more than the monitoring cost.

Proposition 2. *With voluntary appointment of independent directors, there is a positive (negative) market reaction to the appointment of independent directors, and thus the compensation of the honest entrepreneur increases (decreases) when the value of the market's expected monitoring effect plus the positive expected aggressive signaling effect exceeds (does not exceeds) the monitoring cost. However, the compensation of the dishonest entrepreneur must shrink unless the value of the aggressive false signaling effect exceeds the expected loss of private benefit plus the monitoring cost.*

Since entrepreneurs have superior information about future earnings, there is asymmetric information between entrepreneurs and investors. Entrepreneurs have information indicating that long-run profits may be higher than expected by the market. Much information regarding a firm's value is made publicly available through announcements by the firm. Specifically, the voluntary appointment of independent directors should credibly signal integrity information to the market, since it is costly for the dishonest entrepreneur, as it will dramatically reduce his private benefit.

To the extent that entrepreneurs seek to maximize the wealth of shareholders, they will wish to signal their integrity to the market to boost the stock price. Similarly, the market infers firms' integrity from an observable signal, such as the appointment of independent directors. Knowing this, firms have a motivation to manage this signal to get the highest valuation, and knowing that, the market values this signal differently than it would if firms did not manage it. Therefore, the appointment of an independent director is often interpreted as favorable information about integrity and thus drives up the price.

Grinblatt et al. (1984) examine stock splits and stock dividends under the traditional signaling model and point out that it can be considered costly to signal. Academic research generally interprets the positive stock market reaction to stock split and stock dividend announcements as a response to entrepreneurial signaling of favorable inside information.⁴ In the case of appointing independent directors, the monitoring function of independent board members will restrict the entrepreneur's ability to fully exploit private benefits if the firm executes less profitable projects. Hence, if a dishonest entrepreneur would like to mimic the behavior of an honest entrepreneur, the appointment of independent directors would be more expensive than other monitoring activities.

Moreover, insiders may deliberately manage such a policy to change the market's perception about the firm's value. While investors might receive the signal

⁴ Brennan and Copeland (1988); McNicholas and Dravid (1990); Brennan and Hughes (1991).

of entrepreneurs' integrity via the announcement of the voluntary appointment of independent directors, V , the market enhances the conditional probability of an honest entrepreneur to $p(h/\Omega, V)$, so the market price is (Let V denote voluntary appointment):

$$P_V = p(h/\Omega, V)(p_H R_H - D) + (1 - p(h/\Omega, V))(p_L R_L - \beta B - D) \quad (4)$$

Comparing this with no monitoring, we can derive the price effect of voluntary appointment of independent directors as $P_V - P_N$:

$$P_V - P_N = \underbrace{[p(h/\Omega, V) - p(h/\Omega)] [p_H R_H - (p_L R_L - B)]}_{\text{Aggressive Signaling Effect}} + \underbrace{(1 - p(h/\Omega, V))(1 - \beta)B}_{\text{Monitoring Effect}} - \underbrace{(D)}_{\text{Monitoring Cost}} \quad (5)$$

$$\text{if } [p(h/\Omega, V) - p(h/\Omega)] [p_H R_H - (p_L R_L - B)] + (1 - p(h/\Omega, V))(1 - \beta)B \geq D \Rightarrow P_V - P_N \geq 0$$

$$\text{if } [p(h/\Omega, V) - p(h/\Omega)] [p_H R_H - (p_L R_L - B)] + (1 - p(h/\Omega, V))(1 - \beta)B \leq D \Rightarrow P_V - P_N \leq 0$$

The first term of the right hand side (RHS) (5) implies that investors expect the signaling value of voluntary appointment. This is an aggressive signaling effect: the market partially transfers its expected value from the low profit firm to the high profit firm by receiving the entrepreneurs' integrity signal. The second term of the RHS (5) implies that investors expect the monitoring value of voluntary appointment. The independent directors execute their monitoring job to reduce the private benefit to management. The third term of the RHS (5) is the cost D of the monitoring by the independent directors.

If a firm announces a voluntary appointment of independent directors, there is a positive (negative) market reaction to the appointment, when the value of the expected monitoring effect plus the expected positive signaling effect exceeds (does not exceed) the monitoring cost. Accordingly, the related wealth of the two types of entrepreneurs is, respectively:

Honest entrepreneur (h):

$$W_V^h = \alpha P_V$$

$$= W_N^h + \alpha [p(h/\Omega, V) - p(h/\Omega)] [p_H R_H - (p_L R_L - B)] + \alpha (1 - p(h/\Omega, V))(1 - \beta)B - \alpha D$$

$$\text{if } [p(h/\Omega, V) - p(h/\Omega)] [p_H R_H - (p_L R_L - B)] + (1 - p(h/\Omega, V))(1 - \beta)B \geq D$$

\Rightarrow The compensation of the honest entrepreneur is increasing.

$$\text{if } [p(h/\Omega, V) - p(h/\Omega)] [p_H R_H - (p_L R_L - B)] + (1 - p(h/\Omega, V))(1 - \beta)B \leq D$$

\Rightarrow The compensation of the honest entrepreneur is decreasing.

Dishonest entrepreneur (d):

$$W_V^d = \alpha P_V + \beta B$$

$$= W_N^d + \alpha [p(h/\Omega, V) - p(h/\Omega)] [p_H R_H - (p_L R_L - B)] - \alpha D - [1 - \alpha(1 - p(h/\Omega, V))] (1 - \beta)B$$

$$\text{if } \alpha [p(h/\Omega, V) - p(h/\Omega)] [p_H R_H - (p_L R_L - B)] \geq [1 - \alpha(1 - p(h/\Omega, V))] (1 - \beta)B + \alpha D$$

\Rightarrow The compensation of the dishonest manager is increasing.

$$\text{if } \alpha [p(h/\Omega, V) - p(h/\Omega)] [p_H R_H - (p_L R_L - B)] \leq [1 - \alpha(1 - p(h/\Omega, V))] (1 - \beta)B + \alpha D$$

\Rightarrow The compensation of the dishonest manager is decreasing.

With the voluntary appointment of independent directors, the compensation of the honest entrepreneur is increasing (decreasing) when the value of the expected monitoring effect plus the positive expected signaling effect exceeds (does not exceed) the monitoring cost. However, the compensation of the dishonest entrepreneur must shrink unless the value of the positive signaling effect exceeds the expected loss of his private benefit plus the monitoring cost.

Proposition 3: *With the voluntary appointment of independent directors, there exists a negative market reaction to the rejection of appointing independent directors, in that the event passively signals to the market that the entrepreneur is dishonest.*

A voluntary appointment of independent directors is often interpreted as the event that signals favorable information about entrepreneurial integrity to the market. Conversely, a rejection of voluntarily appointing independent directors is also interpreted by the market as signaling that a dishonest entrepreneur has a fear of monitoring by independent directors. The market valuation decreases to incorporate this passive signaling effect of the reluctance of the dishonest entrepreneur to leak out his integrity information to the market by a rejection of voluntarily appointing independent directors. An entrepreneur may decide to passively expose his dishonesty to the market through a rejection to voluntarily appoint independent directors, RV , in order to retain his huge private benefit. Therefore, the market reduces the conditional probability of honest entrepreneur to $p(h/\Omega, RV)$, so the market price is (Let RV denote rejecting voluntary appointment):

$$P_{RV} = p(h/\Omega, RV)p_H R_H + (1 - p(h/\Omega, RV))(p_L R_L - B) \quad (6)$$

Comparing this with no monitoring, we can derive a passive signaling effect of rejecting voluntary appointment of independent directors as $P_{RV} - P_N$:

$$P_{RV} - P_N = \underbrace{-[p(h/\Omega) - p(h/\Omega, RV)][p_H R_H - (p_L R_L - B)]}_{\text{Passive Signaling Effect}} \quad (7)$$

where $-[p(h/\Omega) - p(h/\Omega, RV)][p_H R_H - (p_L R_L - B)] \leq 0$

In equation (7), the decreasing price implies that investors expect the passive signaling value of rejecting voluntary appointment. This is a passive signaling effect: the market partially transfers its expected value from the high profit firm to the low profit firm by receiving the entrepreneur's dishonesty signal. Accordingly, the wealth of the two types of entrepreneurs is, respectively:

Honest entrepreneur (h):

$$W_{RV}^h = \alpha P_{RV} = W_N^h - \alpha[p(h/\Omega) - p(h/\Omega, RV)][p_H R_H - (p_L R_L - B)]$$

where $-[p(h/\Omega) - p(h/\Omega, RV)][p_H R_H - (p_L R_L - B)] \leq 0$

\Rightarrow The compensation of the honest entrepreneur must be decreasing.

Dishonest entrepreneur (d):

$$W_{RV}^d = \alpha P_{RV} + B = W_N^d - \alpha[p(h/\Omega) - p(h/\Omega, RV)][p_H R_H - (p_L R_L - B)]$$

where $-[p(h/\Omega) - p(h/\Omega, RV)][p_H R_H - (p_L R_L - B)] \leq 0$

\Rightarrow The compensation of the dishonest entrepreneur must be decreasing.

If an honest entrepreneur rejects appointing independent directors, the market will misperceive his integrity and punish him by decreasing the stock price. Other things being equal, an honest entrepreneur will be inclined to signal to the market using the voluntary appointment to avoid such misunderstanding. However, the compensation of the dishonest entrepreneur is inevitably decreased, because the rejection, which he is forced to choose if voluntary appointment will decrease private benefit, exposes his dishonesty to the market.

Proposition 4: *With the decision to voluntarily appoint independent directors, an honest entrepreneur decides to appoint (not appoint) independent directors to prove (allow misperception of) his integrity, while the value of the comprehensive signaling effect plus the monitoring effect exceeds (does not exceed) the monitoring cost. However, a dishonest entrepreneur decides to appoint (not appoint) independent directors to pretend that he is honest (to leak out that he is dishonest), while the value of the comprehensive signaling effect exceeds (does not exceed) the expected loss of private benefit plus the monitoring cost.*

In a firm free to appoint independent directors, entrepreneurs decide to appoint or not appoint independent directors in order to maximize their personal wealth. One choice is to reject appointing independent directors. According to the result of *Proposition 3*, we find that the market price decrease solely reflects the passive signaling effect - and both types of entrepreneurs suffer from this choice. The alternative is appointing independent directors. According to the result of *Proposition 2*, the price change depends on the size of three factors including the aggressive signaling effect, the monitoring effect, and the monitoring cost. Hence, the relative wealth of the honest entrepreneur depends on the size of those three factors, but that of the dishonest entrepreneur depends on the size of the aggressive signaling effect, the expected loss of private benefit, and the monitoring cost.

For a signaling device to be valid there should be a cost associated with sending false signals; i.e. it should be prohibitively costly for firms with below-average performance to mimic the signaling decisions of those firms with above-average performance. Notably, a dishonest entrepreneur is not likely to mimic the decision of an honest entrepreneur, which could severely deprive him of private benefit but may slightly exploit signaling value. For an honest entrepreneur, whether to appoint or not may depend on whether the market price is extremely undervalued due to asymmetric integrity information. Eventually, those entrepreneurs would like to mimic or to convey information according to the change of their wealth. Comparing this with rejecting appointments, we can derive the price effect of voluntary appointment of independent directors as $P_V - P_{RV}$:

$$\begin{aligned}
P_V - P_{RV} &= (P_V - P_N) - (P_{RV} - P_N) \\
&= \left\{ \underbrace{\left[p(h/\Omega, V) - p(h/\Omega) \right] \left[p_H R_H - (p_L R_L - B) \right]}_{\text{Aggressive Signaling Effect}} + \underbrace{(1 - p(h/\Omega, V))(1 - \beta)B}_{\text{Monitoring Effect}} - \underbrace{(D)}_{\text{Monitoring Cost}} \right\} \\
&\quad - \left\{ \underbrace{\left[p(h/\Omega) - p(h/\Omega, RV) \right] \left[p_H R_H - (p_L R_L - B) \right]}_{\text{Passive Signaling Effect}} \right\}
\end{aligned}$$

$$= \underbrace{[p(h/\Omega, V) - p(h/\Omega, RV)]}_{\text{Comprehensive}} \underbrace{[p_H R_H - (p_L R_L - B)]}_{\text{Signaling Effect}} + \underbrace{(1 - p(h/\Omega, V))(1 - \beta)B}_{\text{Monitoring Effect}} - \underbrace{(D)}_{\text{Monitoring Cost}} \quad (8)$$

We decompose the price effect into the appointing and the rejecting components in *Proposition 2* and *3*. The first term of the right hand side (RHS) (8) implies that investors expect the comprehensive signaling value of voluntary appointment, including aggressive and passive signaling effects. The second term of the RHS (8) implies that investors expect the monitoring value of voluntary appointment. The third term of the RHS (8) is the cost D of monitoring by independent directors. Accordingly, the compensation of the two types of entrepreneurs is, respectively:

Honest entrepreneur (h):

$$W_V^h - W_{RV}^h \\ = \alpha [p(h/\Omega, V) - p(h/\Omega, RV)] [p_H R_H - (p_L R_L - B)] + \alpha (1 - p(h/\Omega, V))(1 - \beta)B - \alpha D$$

$$\text{if } [p(h/\Omega, V) - p(h/\Omega, RV)] [p_H R_H - (p_L R_L - B)] + (1 - p(h/\Omega, V))(1 - \beta)B \geq D$$

\Rightarrow The honest entrepreneur decides to appoint the independent directors.

$$\text{if } [p(h/\Omega, V) - p(h/\Omega, RV)] [p_H R_H - (p_L R_L - B)] + (1 - p(h/\Omega, V))(1 - \beta)B \leq D$$

\Rightarrow The honest entrepreneur decides not to appoint the independent directors.

Dishonest entrepreneur (d):

$$W_V^d - W_{RV}^d \\ = \alpha [p(h/\Omega, V) - p(h/\Omega, RV)] [p_H R_H - (p_L R_L - B)] - [1 - \alpha(1 - p(h/\Omega, V))] (1 - \beta)B - \alpha D$$

$$\text{if } \alpha [p(h/\Omega, V) - p(h/\Omega, RV)] [p_H R_H - (p_L R_L - B)] \geq [1 - \alpha(1 - p(h/\Omega, V))] (1 - \beta)B + \alpha D$$

\Rightarrow The dishonest entrepreneur decides to appoint the independent directors.

$$\text{if } \alpha [p(h/\Omega, V) - p(h/\Omega, RV)] [p_H R_H - (p_L R_L - B)] \leq [1 - \alpha(1 - p(h/\Omega, V))] (1 - \beta)B + \alpha D$$

\Rightarrow The dishonest entrepreneur decides not to appoint the independent directors.

The decision to voluntarily appoint independent directors to signal integrity hinges on this balance between the benefits of appointment and the opportunity costs of rejecting appointment. Consequently, according to cost-benefit principles, an honest entrepreneur is inclined to announce voluntary appointment of independent directors to reduce information asymmetry in order to increase his stock wealth, since it is highly possible that the value of the comprehensive signaling effect plus the monitoring effect is higher than the monitoring cost. However, a dishonest

entrepreneur is inclined to reject voluntary appointment of independent directors, even if it will leak out the information that he is dishonest, if the expected loss of private benefit plus the monitoring cost exceeds the value of the comprehensive signaling effect. Yet, a dishonest entrepreneur is not likely to announce appointment of independent directors to pretend that he is honest - a false signal to the market - unless the value of the comprehensive signaling effect exceeds the expected loss of private benefit plus the monitoring cost.

According to the above *Propositions*, we define our testable hypothesis as follows:

HO1: The market reaction to the mandatory appointments of independent directors positively associated with the severity of agency problems reflects that the monitoring effect of appointments is significant.

HO2: The market reaction to the voluntary appointments of independent directors positively associated with the severity of agency problems reflects that the combined effect of monitoring value and signaling value is significant.

HO3: The significant differences in abnormal return between the mandatory appointments and the voluntary appointments are in line with the signaling effect.

3. Data and Methodology

3.1. Description of the mandatory and voluntary appointment dataset

This paper examines the influence of the announcement of the appointment of independent directors upon the stock returns of Taiwanese listed firms from January 2001 to December 2005. In Taiwan, there is a mandatory appointment of independent directors, which was imposed on all newly listed firms in the Taiwan Stock Exchange and in the Taiwan OTC stock market after February 2002, and there is a voluntary appointment, which was suggested for all previously listed firms. The mandatory appointment code requires the newly listed firms to appoint two or more independent directors who have never held more than 1% of the outstanding shares in one year before the appointment, and have never been ranked among the ten largest individual shareholders.

The sources of data about the appointments of independent directors were obtained from Taiwan stock market observation stations, the *Infotimes* data bank, and

the *Taiwan Economic Journal* data bank. We applied event study methods to examine the price effects of appointments of independent directors. However, many announcements of mandatory appointment samples lack historical stock price data for the estimated period prior to the announcement day as those are newly listed firms. For this reason, the estimated period is set far behind the event day from day 50 to day 200, following the methods of Mikkelson and Partch (1986).

Our initial sample consists of 238 appointments of outside directors. We excluded 12 announcements from firms that did not have adequate share price data to analyze. Forty-five mandatory appointments were announced before listing, so their stock price data for the announcement day do not exist and those mandatory appointment samples were excluded. Eventually, 141 announcement events are classified into the effective samples of voluntary appointments, and 40 announcement events are classified into the effective samples of mandatory appointments presented in Table 1.

Table1
Description of mandatory and voluntary samples

Items	Number of observations
Initial samples of appointments of independent directors	238
Less: Announcements without sufficient data	-12
Full samples	226
Announcements of voluntary appointment of independent directors	141
Announcements of mandatory appointments of independent directors with samples before listing	85
Less: Announcements of mandatory appointments before listing	-45
Announcements of mandatory appointments of independent directors	40
Announcements of all research samples	181

3.2. Event study model

We use the event study method to investigate the abnormal stock returns of the event period for analyzing the price effects of appointments of independent directors. The event window was 10 days before and after the announcement day. To avoid coefficient estimation error of the market model arising from ARCH phenomenon of

financial assets, GARCH (1,1) modeling was used in this paper for correct heteroskedasticity and serial autocorrelation in the error term. Expected returns were calculated using the following market model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (9)$$

$$\hat{\varepsilon}_{it} | \Omega_{t-1} \sim N(0, h_{it}) \quad (10)$$

$$h_{it} = d_{0i} + d_{1i} \varepsilon_{it-1}^2 + d_{2i} h_{it-1} \quad (11)$$

Maximum likelihood estimation (MLE) is used to estimate the parameters of every firm:

$$\theta = (\hat{\alpha}_i, \hat{\beta}_i, d_{0i}, d_{1i}, d_{2i}) \quad (12)$$

$$\theta^{(i+1)} = \theta^{(i)} - I^{-1} \frac{\partial L}{\partial \theta} \Big|_{\theta=\theta^{(i)}} \quad (13)$$

where, L is a likelihood function, $I = \frac{\partial^2 L}{\partial \theta \partial \theta'}$

The abnormal return AR is the difference between the real return and the expected return:

$$\begin{aligned} AR_{it} &= R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}) \\ &= (\alpha_i - \hat{\alpha}_i) + (\beta_i - \hat{\beta}_i) R_{mt} + \varepsilon_{it} \end{aligned} \quad (14)$$

The variance of AR under GARCH is:

$$Var(AR_{it}) = Var(\hat{\alpha}_i) + R_{mt}^2 Var(\hat{\beta}_i) + 2R_{mt} Cov(\hat{\alpha}_i, \hat{\beta}_i) + Var(\hat{\varepsilon}_{it}) \quad (15)$$

Next, we calculate the cumulative abnormal returns of firm i from day t_1 to day t_2 with the following formula:

$$CAR_i = \sum_{t=t_1}^{t_2} AR_{it} \quad (16)$$

3.3. Regression model

To distinguish between the monitoring effect and the signaling effect of appointments of independent directors, we set up a multiple regression model by considering the cumulative abnormal return (*CAR*) of event windows (0,1) and (0,10) as the dependent explanatory variables. The relationship between the cumulative abnormal returns and the hypothesis variables is examined, including the monitoring variable and the signaling variable. The explanatory variables, as below, represent the monitoring value and the signaling value, respectively:

(a) The proxy variables of monitoring effect

The appointments of independent directors are considered a tool to strengthen corporate governance in that the discipline of outside directors on the incumbent management contributes to the release of the pressure of agency problems. Agency problems are defined as the conflicts of interest between entrepreneurs and shareholders. The percentage of shares held by directors prior to the announcement is used as a proxy for the severity of any agency problem in Lin et al. (2003). It is argued that greater overlap between ownership and control within the firm reduces the conflict of interest between entrepreneurs and outside shareholders. Morck et al. (1988), Weisbach (1988), and McConnell and Servaes (1990) found supportive evidence for this argument. The variable *Own* is the shareholding proportion of the board of directors.

Moreover, Jensen (1986) finds that firms with more free cash flow are associated with more severe overinvestment agency problems. Therefore, appointments of independent directors are likely to be more beneficial for a firm with relatively greater amounts of free cash flow in that it could reduce the agency costs. Hence, free cash flow, *FCF*, is employed as a second proxy variable for the severity of the agency problem. *FCF* is defined by the method of Lehn and Poulsen (1989):

$$FCF_i = \frac{(INC_i - I_i - TAX_i - D_i)}{E_i} \quad (17)$$

where *INC* is operating income before depreciation, *I* is interest expense, *TAX* is income tax, *D* is cash dividend, and *E* is book value.

(b) The proxy variable of signaling effect

Taiwan's regulatory environment offers a unique opportunity to gain further insight into the signaling hypothesis of the appointments of independent directors. This situation allows us to distinguish between the voluntary appointments of independent directors that are intended to signal a permanent increase in stock value

as a signaling effect plus a monitoring effect, and the mandatory appointments that are merely a reaction to a change in the law and only have a monitoring effect. *Signal* is a dummy variable, which takes the value of 1 when the appointment of independent directors is a voluntary sample, and takes the value of zero when it is a mandatory sample.

Three control variables are used, including the independence of the board of directors, the firm size, and the ratio of book value to market value of equity in the model. Extant research suggests a positive relationship between the percentage of independent directors and firm performance.⁵ Besides, Fama and French (1992, 1996) suggest that the firm size and the book-to-market ratio are risk factors. The regression model is as follows:

$$CAR_i = \alpha_0 + \alpha_1 Agency_i + \alpha_2 Signal_i + \alpha_3 Agency_i \times Signal_i + \alpha_4 Agency_i \times Indep_i + \alpha_5 Signal_i \times Indep_i + \alpha_6 Size_i + \alpha_7 B/M_i + \varepsilon_i \quad (18)$$

where CAR_i is cumulative abnormal returns of firm i ; $Agency_i$ is the severity of agency problem of firm i including Own_i (as the percentage of shares held by directors prior to the announcement) and FCF_i (free cash flow); $Signal_i$ is a dummy variable indicating whether the appointment of independent directors of firm i is voluntary; $Indep_i$ is the percentage of independent directors to all directors of firm i ; $Size_i$ is the natural logarithm of total firm assets 1 year before the announcement from firm i ; B/M_i is the ratio of book value to market value 1 year before the announcement from firm i .

4. Empirical Results

4.1. Announcement effect of the appointment of independent directors

According to event study models, the abnormal returns and the cumulative abnormal return of full samples around the event period are reported in Panel A and Panel B of Table 2, respectively. The empirical results show that there is no significant market reaction to the announcement of the appointment of independent directors, which is consistent with Lin et al. (2003).

⁵ Kaplan and Minton (1994), Renneboog (2000), Dahya et al., (2000), Hossain et al., (2001) and Suchard et. al., (2001) argued that the independence of the board depends on the number of independent directors.

Furthermore, the voluntary and mandatory appointments of independent directors are examined, respectively, and those results are presented in Table 3. The *AR* and *CAR* of the mandatory sample are still not significant. Hence, the mandatory appointment policy brings investors an insignificant monitoring value, so the regulation is not effective for the market. Interestingly, the significant negative *AR* -1 day (-0.252%) of the voluntary sample represents that there is a passive signaling effect before the event day in that the firms did not announce the appointment of independent directors, which investors waited for, to signal their dishonesty. On the other hand, the significant positive *AR* 1 day (0.218%) of the voluntary sample shows that there is an aggressive signaling effect after the event day in that the firms volunteered to appoint independent directors to signal their integrity.

More importantly, first, the significant positive *CAR* related to the window before the event day (-1,0) supports the passive signaling effect except (-10,0); second, the significant positive *CAR* related to the windows after the event day ((0,1), (0,10)) supports the aggressive signaling effect; third, the significant positive *CAR* related to the windows during, before, and after the event day ((-5,5), (-10,10)) supports the comprehensive signaling effect. In addition, in comparisons with the three samples used to graph *AR* and *CAR* in Figure 2 and Figure 3, the same evidence can also be obtained.

Consequently, this evidence is consistent with the passive signaling effect, that the market partially transfers its expected value from the high profit firm to the low profit firm by receiving the entrepreneurs' dishonesty signal; with the aggressive signaling effect, that the market partially transfers its expected value from the low profit firm to the high profit firm by receiving the entrepreneurs' honesty signal; and with the comprehensive signaling effect, that there exists simultaneously the aggressive and passive signaling effect in the decision to voluntarily appoint independent directors.

Table 2

Announcement effect of the appointment of independent directors

The GARCH (1,1) market model based event study was used to calculate the abnormal returns. The window was 10 days before and after the announcement day. The estimated period is from day 50 to day 200. The abnormal return (AR) is the difference between the real return and the expected return. CAR (t_1, t_2) is the cumulative abnormal returns from day t_1 to day t_2 . *, **, and *** denote significance at the 10, 5 and 1 % levels, respectively.

Panel A : Abnormal returns of announcements of independent director appointments

t	AR	t(AR)
-10	0.083	0.822
-9	0.062	0.668
-8	0.027	0.301
-7	-0.030	-0.331
-6	-0.024	-0.260
-5	0.103	1.055
-4	0.063	0.691
-3	0.087	0.901
-2	-0.071	-0.852
-1	-0.164	-1.719 *
0	0.024	0.244
1	0.137	1.380
2	-0.077	-0.900
3	0.016	0.198
4	0.086	1.013
5	0.120	1.350
6	0.005	0.053
7	0.043	0.486
8	-0.060	-0.691
9	0.014	0.164
10	0.044	0.477

*Panel B : Cumulative abnormal returns of announcements of**Independent director appointments*

Windows	CAR	t(CAR)
(-1,0)	-0.139	-1.022
(-10,0)	0.161	0.503
(0,1)	0.162	1.069
(0,10)	0.353	1.143
(-1,1)	-0.002	-0.011
(-5,5)	0.325	1.116
(-10,10)	0.489	1.131

Table 3

Announcement effect of independent appointments: Voluntary vs. Mandatory

The GARCH (1,1) market model based event study was used to calculate the abnormal returns. The window was 10 days before and after the announcement day. The estimated period is from day 50 to day 200. The abnormal return (AR) is the difference between the real return and the expected return. CAR (t_1, t_2) is the cumulative abnormal returns from day t_1 to day t_2 . **, and *** denote significance at the 10, 5 and 1 % levels, respectively.

Panel A : Abnormal returns of announcement of independent director appointments:

Voluntary appointments vs. Mandatory appointment

t	Voluntary		Mandatory	
	AR	t(AR)	AR	t(AR)
-10	0.069	0.580	0.064	0.347
-9	0.160	1.397	-0.034	-0.199
-8	0.095	0.943	-0.108	-0.561
-7	0.005	0.046	-0.149	-0.763
-6	-0.021	-0.184	0.065	0.386
-5	0.109	0.913	0.056	0.290
-4	0.075	0.694	0.103	0.549
-3	0.064	0.543	0.129	0.626
-2	-0.044	-0.422	-0.084	-0.503
-1	-0.252	-2.205 **	0.014	0.072
0	-0.006	-0.049	0.118	0.577
1	0.218	1.839 *	0.023	0.117
2	0.047	0.457	-0.247	-1.502
3	0.042	0.431	0.100	0.635
4	0.114	1.024	-0.012	-0.078
5	0.161	1.467	0.021	0.123
6	0.088	0.777	-0.103	-0.609
7	-0.034	-0.334	-0.071	-0.508
8	-0.192	-1.913 *	0.045	0.278
9	-0.019	-0.182	0.151	0.986
10	0.124	1.094	-0.029	-0.174

Panel B : Cumulative abnormal returns of announcements of

Independent director appointments

Signaling effect	Windows	Voluntary		Mandatory	
		CAR	t(CAR)	CAR	t(CAR)
Passive	(-1,0)	-0.258	-8.764***	0.132	0.398
	(-10,0)	0.254	3.681***	0.175	0.225
Aggressive	(0,1)	0.212	5.966***	0.141	0.459
	(0,10)	0.541	7.499***	-0.005	-0.006
Comprehensive	(-1,1)	-0.040	-1.001	0.155	0.356
	(-5,5)	0.528	8.060***	0.221	0.326
	(-10,10)	0.802	7.802***	0.052	0.053

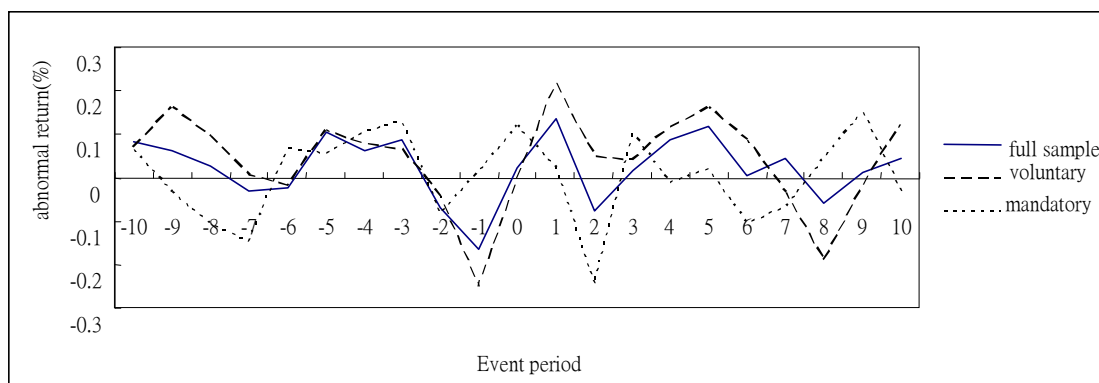


Fig. 2. Abnormal returns of announcements of independent director appointments

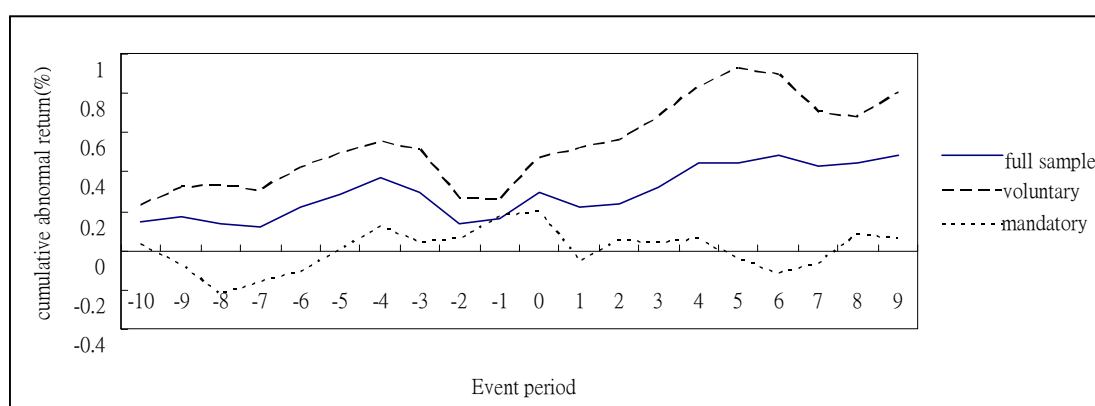


Fig. 3. Cumulative abnormal returns of announcements of independent director appointments

4.2. Regression Results

Table 4 reports the statistics for appointments of independent directors between January 2001 to December 2005 for the listed firms on the Taiwan Stock Exchange and the Taiwan OTC market. The mean of the percentage of shares held by directors prior to the announcement is 24.82%. The proportion of the voluntary appointments of independent directors to all samples is about 72%, indicating that more established firms have gradually strengthened corporate governance. In this research sample, 71% of firms have a board comprised of 5-7 directors, and only 10 firms have a board of over 10 directors. Most of the firms have 2 independent directors, and only 11 firms have 3 independent directors. The average independence of the board (*Indep*), only 25.2%, is lower than that for U.S. companies.

The differential tests comparing voluntary appointments with mandatory appointments are presented in Table 5. The percentage of shares held by directors prior to the announcement of voluntary appointments (*Own*) is significantly higher than the

percentage of shares held by directors prior to the announcement of mandatory appointments; the free cash flow of voluntary appointment firms (*FCF*) is significant lower than the free cash flow of mandatory appointment firms; and the firm size of voluntary appointments is significant bigger than the firm size of mandatory appointments.

Table 4
Descriptive Statistics

Variable	Mean	Std Dev	Minimum	Maximum	Skewness	Kurtosis
<i>CAR(0,1)</i>	0.192	0.157	-4.161	7.695	1.026	2.988
<i>CAR(0,10)</i>	0.395	0.334	-8.150	18.390	1.132	2.878
<i>Own (%)</i>	24.820	1.168	0.0120	78.870	0.891	0.799
<i>FCF</i>	1.446	1.418	0.004	9.464	2.833	11.105
<i>Signal</i>	0.72	0.036	0	1	-1.010	-0.992
<i>Indep</i>	0.252	0.008	0.083	0.600	0.580	-0.204
<i>Size</i>	14.452	1.366	13.418	19.949	1.311	1.296
<i>B/M</i>	1.237	1.116	0.719	7.428	1.105	1.698

Table 5
Differential tests of means between voluntary and mandatory appointments

Variable	Voluntary		Mandatory		Different	t value
	Mean	Std Dev	Mean	Std Dev		
<i>CAR(0,1)</i>	0.237	0.184	0.141	0.190	0.096	0.785
<i>CAR(0,10)</i>	0.557	0.378	-0.005	0.441	0.562	0.746
<i>Own (%)</i>	23.086	1.377	29.909	1.248	-6.823 ***	-2.679
<i>FCF</i>	1.358	0.125	1.701	0.160	-0.343 *	1.796
<i>Indep</i>	0.249	0.010	0.259	0.009	-0.010	-0.515
<i>Size</i>	15.623	0.138	15.053	0.099	0.570 **	2.341
<i>B/M</i>	1.318	1.058	1.375	1.206	-0.057	-0.783

The regression results of *CAR* (0,1) and *CAR* (0,10) are reported in Table 6. The risk factors - including the size and the ratio of book-to-market value – are considered in order to separate the appointments' effect on independent directors. The significantly negative coefficient of *Own* means that lower shareholding leads to a more severe agency problem. Hence, the appointment of independent directors is deemed to improve the monitoring function of the board for a severe agency problem. It is directly proved by the monitoring effect of the appointments of independent directors. Yet, the other proxy of agency problems, *FCF*, is not significant.

Specifically, the coefficients of *Signal* are significantly positive. This provides strong evidence to support the signaling effect of voluntary appointments of independent directors. However, the significant positive coefficient of the interaction of *Own* and *Signal* in the *CAR* (0,10) regression represents that, with severe (mild) information asymmetry, investors are hardly (easily) convinced by the voluntary appointment of independent directors that the entrepreneur is honest. Besides, the significant coefficient of the interaction of *Own* and *Indep* also means that the power of independent directors could deeply enforce the monitoring function of the board.

Table 6

Monitoring Effect and Signal Effect of Independent Directors' Appointment Announcement

	CAR(0,1)		CAR(0,10)	
Intercept	1.891 (0.777)	3.563 ** (1.944)	-11.804 ** (-2.274)	-1.675 (-0.420)
Own	-0.127 * (-2.044)		-0.136 ** (-2.472)	
FCF		0.103 (1.244)		0.998 (1.084)
Signal	1.533 * (1.778)	1.352 * (1.868)	10.431 ** (2.164)	1.779 ** (2.130)
Own*Signal	0.011 (0.426)		0.133 ** (2.339)	
FCF*Signal		-0.102 (-0.438)		0.105 (0.209)
Own*Indep	-0.024 *** (-2.549)		-0.031 ** (-2.325)	
FCF*Indep		-0.175 (-0.144)		1.749 (0.961)
Signal*Indep	-2.469 (-0.651)	4.236 (0.922)	2.764 (0.342)	6.291 (1.313)
Size	-0.213 * (-1.720)	-0.210 * (-1.787)	0.186 (0.707)	0.168 (0.657)
B/M	0.126 (0.862)	0.426 (0.460)	0.225 (0.711)	0.158 (0.641)
Adj R ²	0.249	0.279	0.297	0.310

A possible reason that *FCF* is not significant in Table 6 is that *FCF* focuses too narrowly on the agency problem of overinvestment. Further examination is called for; Lehn and Poulsen (1989) suggest that an agency problem of overinvestment may occur in a poorly performing firm with a higher *FCF*. In this paper, samples are divided into two groups - good performance and poor performance - by the Tobin Q.

There are 34 samples of data with a Tobin Q less than one (poor performance firms) and 147 with a Tobin Q of more than one (good performance firms); the regression results are reported in Table 7. Obviously, the poor performance firms have a significant positive coefficient of *FCF*, implying that appointments of independent directors could improve the monitoring level for top management, thereby avoiding overinvestment in order to benefit investors. The coefficient of interaction between *FCF* and *Signal* is significantly negative. It is similar to the other proxy variable for agency problems, *Own*, in Table 6. The significant negative coefficient of the interaction of *FCF* and *Signal* in poor firms shows that, with severe (mild) overinvestment information asymmetry, investors are hardly (easily) convinced that the entrepreneur is honest by the voluntary appointments of independent directors in order to signal to the market. Furthermore, the significant positive coefficient of the interaction of *FCF* and *Indep* also means that the power of independent directors could strongly enforce the overinvestment monitoring function on the boards of poor firms.

Table 7
Free Cash Flow and Independent Directors Appointment Announcements

	CAR(0,1)		CAR(0,10)	
	Q > 1	Q < 1	Q > 1	Q < 1
Intercept	1.281 *	2.106	-6.124 **	-1.216
	(1.945)	(1.212)	(-2.108)	(-0.682)
FCF	0.108	0.173 *	0.662	0.426 *
	(1.065)	(1.999)	(1.610)	(1.944)
Signal	1.218 *	1.124 *	4.105 **	1.267 *
	(2.103)	(1.962)	(2.224)	(1.867)
FCF*Signal	0.151	-0.016 **	-0.201 *	-0.115 **
	(0.816)	(-2.138)	(-1.776)	(-2.209)
FCF*Indep	0.615	0.824 *	0.304	1.026 *
	(1.135)	(1.828)	(1.067)	(1.961)
Signal*Indep	1.496	1.628	2.114	2.105
	(0.996)	(0.864)	(0.995)	(1.006)
Size	-0.305 *	0.168 *	0.203	0.127
	(-1.810)	(1.226)	(0.928)	(0.881)
B/M	0.216 *	0.315	0.214	0.139
	(1.862)	(0.853)	(0.622)	(0.957)
Adj R ²	0.179	0.228	0.159	0.198

5. Conclusions

This paper has described and discussed the optimal decision model of appointments of independent directors for an honest entrepreneur and a dishonest entrepreneur, respectively. It should be noted that, for reasons of tractability, we provide the common insight that the monitoring effect and the signaling effect might co-exist in the market to react to the appointments of independent directors.

Given the contradictory evidence of monitoring effects presented by Lin et al. (2003) and Rosenstein and Wyatt (1990), we must emphasize that the role of the signaling effect of appointments of independent directors is more important than that of the monitoring effect, because the contradiction might be stemming from the indiffereniable analysis between the signaling effect and the monitoring effect. Fortunately, Taiwan's regulatory environment offers a unique opportunity that allows us to gain further insight into the signaling effect and the monitoring effect of independent director appointments. Our theoretical model and empirical design serve as a first attempt to simultaneously incorporate the signaling effect and the monitoring effect into analyzing appointments of independent directors.

Our analysis has provided four main implications. First, there simultaneously exists signaling effects and monitoring effects of appointing independent directors. Appointing independent directors is a good way to signal entrepreneurs' integrity to the market. Second, honest entrepreneurs are inclined to appoint independent directors to distinguish themselves from dishonest firms and thus to avoid an undervalued market price. Third, a dishonest entrepreneur is not likely to mimic the behaviors of an honest entrepreneur, announcing the appointment of independent directors, just to pretend that they are honest - a false signal to the market - unless appointment of independent directors could exploit the signaling value and related monitoring activities while only slightly depriving entrepreneurs of private benefit in markets with integrity information asymmetry. Fourth, a firm may refer to market perceptions to appoint an independent director with high fees and a strong reputation in order to magnify the signaling effect.

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