



Corporate governance under asymmetric information: Theory and evidence

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ABSTRACT

This paper discusses and explores three situations under asymmetric information. First, companies with a higher level of corporate governance provisions compensate the owner–manager with a higher managerial reward for information disclosed. Second, there are significant and positive relationships between information disclosed and corporate governance provisions, as well as between company value and corporate governance provisions. The higher proportion of a firm held by the largest owner(s) has negative impacts on information disclosed and shareholder rights as outside investors underestimate the companies' performance caused by insufficient effort of the owner–manager or by other factors. Third, audits improve moral hazard when outside investors are informed of bad company performance by underestimating the stock price.

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1. Introduction

The literature has vastly discussed the interaction between owner–managers and outside investors (Bebchuk and Neeman, 2009; Drymiotis, 2008; Fuerst and Kang, 2004; La Porta et al., 1999, 2000a; Tirole, 2001). This paper demonstrates the effects of corporate governance on companies' stock price under three situations where there is asymmetric information between outside investors and the owner–manager. To explore these situations empirically, we use data of the World Bank to prove that a relationship exists between corporate governance and company performance.

Information disclosed about a company is important to corporate governance, in order to get a higher stock price evaluation from outside investors in the stock market. Gompers et al. (2003) proved the positive relationship between corporate governance and company performance through an investigation of shareholder rights and stock price compensation. Cuñat et al. (2012) examined the effect of corporate governance provisions on shareholder value and found that abnormal returns from the stock market are due to shareholder-sponsored governance proposals. Our paper proves that outside investors reward management running companies with different levels of corporate governance

provisions through the stock price, especially when corporate governance provisions² and the effort to disclose information – voluntary disclosures – are the personal decisions of the owner–manager.

Why is it difficult for outside investors to expect a positive relationship between corporate governance and company performance? Following the research of Gompers et al. (2003), Bauer et al. (2004) found a negative relationship between corporate governance and company performance. Core et al. (2006) failed to support the hypothesis that companies with a lower level of corporate governance provisions have lower stock prices. Larcker and Tayan (2011) pointed out seven myths of corporate governance and considered it unsurprising that the standard and best practice of corporate governance may not exist. Because a company is an organized system, its success is judged by its external conditions and interactive elements, and by the planning and execution process of strategies.

Asymmetric information is one abstract factor adopted herein to explain inefficient corporate governance provisions. To find out the practical meaning about corporate governance provision applicable

² Based on the implicit assumption of Tirole (2001), corporate governance provisions are drawn as very powerful contracts or laws that force controlling investors to perfectly internalize their welfare so that investors must receive the controlling rights. Taking it a step further, this kind of corporate governance provisions could be the choice of corporate governance arrangements (Bebchuk, 2002), such as providing incentives, performing monitoring or control, and/or setting up legal protection as pointed out by Vives (2000). Corporate governance provisions have been widely discussed in Cuñat et al. (2012) – for example, provisions that protect managers from the external discipline of takeovers (such as poison pills, staggered boards, or golden parachutes) and statutes that insulate managers from the monitoring and control of shareholders (Bebchuk et al., 2009; Gompers et al., 2003).

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all around the world, we implement indicators of the World Bank for 217 countries in both developed and developing nations. They are four referred proxies of company performance with corporate governance provisions: right (strength of legal rights index, 0 = weak to 10 = strong), share (market capitalization of listed companies, % of GDP), credit (credit depth of information index, 0 = low to 6 = high), and risk (risk premium on lending, prime rate minus treasury bill rate, %).³ To demonstrate the information-disclosing efforts and incentives of keeping the managerial position, we model possible impacts of corporate governance on a company and examine models with data at the country level from the World Bank.

This paper finds that company performance under corporate governance provisions is affected by the owner–manager. The evidence also shows that information disclosure complements monitoring by improving the asymmetric information (Cormier et al., 2010). From the model derivation and estimated functions of incentive⁴ (e.g. incremental stock price), we note that the effort exerted by the owner–manager of a company may be underestimated and shown by a lack of efficient monitoring. This may result from other factors affecting company performance and may lead to moral hazard (Chhaochharia and Grinstein, 2007). The risk of moral hazard is both reflected on corporate governance provisions and managerial reward theoretically. There is evidence of a significant difference between the identities of an owner–manager as the owner and as the manager on information disclosure and corporate governance provisions respectively. Despite some studies in the literature similar to Larcker and Tayan (2011), who pointed out that there is no relationship between managerial reward and company performance, stock price increments may provide incentives to create long-term wealth for shareholders. This paper argues that company value enhanced by increments of the stock price may provide a better background to incentivize the owner–manager by enforcing corporate governance provisions.

Core et al. (2006) offered another explanation for why a company with a lower level of corporate governance provisions may suffer from a lower stock price. It could be that outside investors expect the stock price of a company with a lower level of corporate governance provisions to plummet due to agency costs, such as managerial shirking, over-investments, and perquisite consumption. Corporate governance in this situation may not result in any relationship among stock-based compensation, shareholders' rights, and future cash flow. Another question is why an owner–manager in a company with a higher level of corporate governance provisions still enjoys stock-based compensation and complements monitoring by only keeping the same level of corporate governance provisions and information-disclosure (Cormier et al., 2010). The reason is that in practice, the efficiency of enforcing corporate governance is difficult to observe by outside investors and is often estimated by several methods, such as by providing incentives, performing monitoring or

control, and/or setting up legal protection (Vives, 2000). This paper searches to understand the effects of managerial reward and audits – mandatory disclosures – on corporate governance through both theoretical and empirical models.

Kurihama (2007) viewed companies as public institutions to discuss asymmetric information existing between shareholders and owner–managers. Independent auditing and monitoring the owner–manager enhance the credibility of financial reports used to control the operating activities of owner–managers. Ghosh (2007) directly pointed out that the external monitoring of auditors improves the problem of moral hazard generated from high managerial ownership. Audits are positively correlated with company performance, which is in turn improved by external monitoring. However, the function of an audit on corporate governance differs among companies and lacks country-level data. This paper only derives models to find if audits can indeed improve the problem of moral hazard for outside investors. The results of OLS regression states that when information disclosed improves shareholders rights through the positive relationship between company value and shareholders rights, an audit does improve information disclosed and company risk.

The paper is organized as follows. Section 2 reviews the related literature. Section 3 proves theoretically how outside investors reflect company value on a stock price for companies with different levels of corporate governance provisions. Furthermore, the effects of incentives and audits on companies with different levels of corporate governance provisions after the occurrence of moral hazard are also discussed. Section 4 considers two robustness checks. Section 5 tries to empirically prove the moral hazard that different owner–managers may face by maintaining corporate governance provisions with incentives and audits. Section 6 concludes the analysis.

2. Literature review

This paper discusses the problems of asymmetric information generated from the process in which owner–managers⁵ enhance stock prices through corporate governance. Prior to the now-famous Enron case, the promise of protecting minority shareholders made by owner–managers had been proven to enhance stock prices.⁶ Lately, however, scholars have proposed and recommended the importance of corporate governance. We discuss corporate governance associated with two strands of the literature: incentive and audit as internal monitoring and external monitoring, respectively. When outside investors notice the information released from the investment market to avoid loss, owner–managers, as directors of their companies, have incentives to enforce corporate governance and disclose information.

Suppose now that an owner–manager of a public company operates it for outside investors in the market. Grenadier and Wang (2005) analyzed how an owner delegates the execution decision to an owner–manager by the real option method. When the owner–manager is the only person to know the future value of an investment, the timing to execute options determines the reward for the owner–manager who makes an effort to disclose information. If the

³ Strength of legal rights index (0 = weak to 10 = strong) measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 10, with higher scores indicating that these laws are better designed to expand access to credit. Market capitalization of listed companies (% of GDP) (also known as market value) is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. Listed companies do not include investment companies, mutual funds, or other collective investment vehicles. Credit depth of information index (0 = low to 6 = high) measures rules affecting the scope, accessibility, and quality of credit information available through public or private credit registries. The index ranges from 0 to 6, with higher values indicating the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. Risk premium on lending is the interest rate charged by banks on loans to private sector customers minus the "risk-free" treasury bill interest rate at which short-term government securities are issued or traded in the market. In some countries this spread may be negative, indicating that the market considers its best corporate clients to be lower risk than the government. The terms and conditions attached to lending rates differ by country, however, limiting their comparability.

⁴ The theory is proposed by Laffont and Martimort (2002).

⁵ Perez-Gonzalez (2006) found that publicly-traded companies ruled by family heirs, whereby the incoming chief executive is related by blood or marriage to the departing CEO, underperform versus those not having family successions despite the family background. It is because minority investors are unable to share in the private benefits of control that comes from the company.

⁶ Gomes (2000) modeled the agency problem between controlling shareholders and minority shareholders as a stochastic game with incomplete information. Situations exist where the corporate governance structure insulates large shareholders and when the legal system does not protect minority shareholders due to poor laws or poor enforcement of laws. Thus, the owner–manager's actions depend on the costs of extracting private benefits that only he knows, although outside investors recognize the probability distributions of owner–manager types. Gomes (2000) showed his argument that companies can sell shares to minority shareholders without any explicit mechanism of governance, because managers are able to commit implicitly to not expropriating shareholders, which enhances the stock price.

inefficiency of investment timing can be mitigated from hidden information and the actions of the owner–manager, then the effort exerted for options will strengthen the incentives. [Bebchuk and Neeman \(2009\)](#) further modeled the benefits of equity capital in public companies, finding that it is easy for the owner–manager and controlling shareholders to extract private benefits due to their controlling rights. However, the existence of specific groups of politicians conversely results in an efficient level of investor protection, because the owner–manager and the controlling shareholders are able to make use of company resources to affect the group and get support in return for company operations and private benefits. This curbs the balance between internal monitoring and external monitoring, making it uneasy to distinguish the performance between incentive and effort.

In this paper the condition of the managerial position provides incentives for the owner–manager to allege a higher and positive evaluation of himself and his company with corporate governance. Outside investors will evaluate the production of a company and estimate the compensation for the owner–manager through the stock price. Papers have tried to prove the positive incentive effects of managerial stockholdings to company stock price, as well as the positive relationship between corporate governance and company performance ([Gompers et al., 2003](#); [Johnson et al., 2009](#)). However, the results obtained by [Core et al. \(2006\)](#) do not support the hypothesis that weak governance causes poor stock returns.

As for the relationship between corporate governance and company performance, the literature has discussed many other factors. [Bebchuk et al. \(2009\)](#) proved the negative relationship between corporate governance and company value. [Drymiotis \(2008\)](#) also presented how an owner–manager affects the evaluation of his performance with his abilities. To solve the control problem between the board and the owner–manager and to reduce the cost of compensation, an audit is used, which is a direct conjecture of the board over a productive effort from the owner–manager, but it also causes an asymmetric information cost at the same time. A consecutive transfer of rights concerns the stakes between the owner–manager and shareholders, including whether the owner–manager extracts too much private benefit to keep his job position and exerts effort to keep the same level of corporate governance.

When we take the standpoint of the owner–manager into account and link his effort on information disclosure for corporate governance with managerial compensation and company performance, moral hazard may occur when outside investors evaluate the level of corporate governance. This also creates a trickier situation if independent directors exist. A board composed of directors who are more independent may actually perform worse. Moreover, higher equity incentives for the board may increase equity-based compensation awards to management ([Kumar and Sivaramakrishnan, 2008](#)).⁷ Moral hazard appears when outside investors are not informed that a lower stock price evaluation from corporate governance is due to the insufficient effort of the owner–manager or from other factors.

The role of board members may cause controversy to enforce corporate governance provisions with the trade-off between incentive and audit when we find the impacts brought by owners–managers on both information disclosure and corporate governance provisions are not positive. The finding is consistent with [Schondube–Pirchegger and Schondube \(2010\)](#), who derived that incentive effects from such contracting differ substantially for supervisory board members as opposed to management board members.⁸ To avoid agency conflicts

⁷ With asymmetric information, more dependent directors perform relatively poorly in designing incentive-efficient contracts for the top management, therefore achieving a lower shareholder value.

⁸ Broadly speaking, the management board manages the business. The supervisory board monitors and advises the management board. It hires the management board members and determines their compensation contracts. Moreover, it nominates the firm's auditor, which implies a specific responsibility for financial reporting ([Schondube–Pirchegger and Schondube, 2010](#)).

between board members and owners, and an ambiguous relationship between the board's independence and the firm's performance, we do not specify the number of independent directors and expertise of board members in the implementation of corporate governance. We also consider that board independence is found to be negatively correlated with operating performance, although stock ownership of board members is positively related to future operating performance ([Bhagat and Bolton, 2008](#)).

[Shleifer and Vishny \(1997\)](#) concluded that the legal protection of outside investors is an essential element of a good corporate governance system. Looking around the world for the severity of agency problems in which minority shareholders are exposed, [La Porta et al. \(2000b\)](#) demonstrated that corporate law gives outside investors, including shareholders, certain powers to protect their investment against expropriation by insiders. Such legal protection consists of both laws and the quality of their enforcement, which can only be proven in the form of an audit. [Ghosh \(2007\)](#) proposed that internal managerial monitoring, external auditing, and company valuation are jointly determined, with each tending to reinforce the other. [Holt and DeZoort \(2009\)](#), on the other hand, stated that internal audit reports provide a useful complement to other existing governance mechanisms. However, their study also finds that there is little evidence in fact showing that laws will improve the results of corporate governance ([Larcker and Tayan, 2011](#); [Larcker et al., 2011](#)). Unless laws and regulations function as a background for an audit, information disclosed and company value do have positive impacts on shareholders rights in our paper. There then does exist a positive relationship between audit and information disclosed.

[Chhaochharia and Grinstein \(2007\)](#) on the other hand pointed out that laws and regulations do not necessarily result in more efficient monitoring and a higher company value. Even as delegating governance to the board improves monitoring, it creates another agency problem, because directors themselves avoid effort and are dependent on the CEO ([Kumar and Sivaramakrishnan, 2008](#)). The most appropriate framework of corporate governance depends on the needs and different cost–benefits of a company's monitoring mechanisms. However, the cost–benefits may not apply to all companies and may change with time. That is why we test the hypotheses derived by theoretical propositions with country-level data. The truth seems that although the owner–manager can be very effective in enforcing corporate governance, it is hard for him to prove any performance attributable to himself. This sets up a limit to the relationship between managerial compensation and company performance.

To be qualified, a manager follows the routine operational steps as what stakeholders of a company (the board, employees, and shareholders) expect him to do ([Tirole, 2001](#)). The more details the manager takes into consideration, the more he has to work harder. From the derivation of [Dewatripont and Tirole \(2005\)](#), lower congruence pushes the manager to fill an ordinary job with functions of corporate governance through communications. At the same time, the main effort for an owner–manager to enclose the corporate governance provisions is with asymmetric information, rather than with communication in this paper. All outside investors capable of having tried hard to understand this situation put emphasis on the differentiation between voluntary and mandatory disclosures. Moreover, significant difference exists between the identities of an owner–manager as the owner and as the manager on information disclosure and corporate governance provisions to maintain the same level of corporate governance provisions. Nonetheless, the owner–manager still persuades stakeholders to trust him for the cue⁹ of company value by his effort. This results in three situations of asymmetric information herein, whereby the

⁹ Information relates to the credibility of the owner–manager rather than to the issue of corporate governance at stake ([Dewatripont and Tirole, 2005](#)).

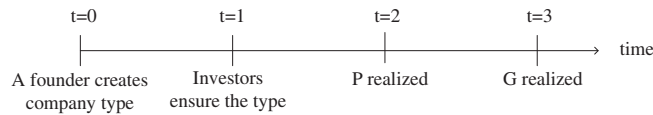
owner–manager makes sure he can both keep the managerial position to operate the company and maintain the vested benefits of the incremental stock price.

3. The theoretical models

3.1. Corporate governance provisions for company performance

Following Laffont and Martimort (2002) setup of an incentive model, consider the situation whereby an owner–manager operates a company. The owner–manager implements corporate governance G with the company's extrinsic value $P(G)$, where $P'(G) > 0$, $P''(G) < 0$, and $P(0) = 0$, while outside investors obtain the company's intrinsic value of $V(G)$, where $V'(G) > 0$, $V''(G) < 0$, and $V(0) = 0$. Outside investors then buy the company at a low or high stock price, as different owner–managers enhance company value by revealing the investors' protection structure, such as regulations written in the company's charter and bylaws, creditors' protective covenants, and/or information disclosure to the markets and stakeholders. The timing of the events is sequenced as follows.

- $t = 0$ Initially, a company owner is the sole owner–manager and is the one who designs the company with different levels of corporate governance provisions.
- $t = 1$ Outside investors in the market want to ensure the company value that they receive by insisting on levels of corporate governance provisions they want.
- $t = 2$ The price of the company's stock is realized.
- $t = 3$ The levels of corporate governance provisions are differentiated.



In the stock market, outside investors want to get a return on investment by buying stocks. As far as the logical concepts discussed in economics are concerned, $V(G)$ may be regarded as the value of investing in the company for outside investors, which is also the benefit of investing in the company for outside investors. The payment for the purchase of company stocks is $P(G)$, which can be taken as the cost of outside investors to invest in a company's stock. Therefore, $V(G) - P(G)$ is the consumer surplus from investing. To promote the company through performance, owner–managers who decide whether outside investors will enhance the evaluation of a stock price will try hard to polish their companies up through corporate governance. Enforcing corporate governance costs the owner–manager a marginal cost c , which belongs to the set $C = \{c_L, c_H\}$. The owner–manager thus can be either inefficient (c_L) or efficient (c_H), with respective probabilities λ and $1 - \lambda$.

We thus write the objective function of outside investors in purchasing a company's stock as:

$$\text{Max}_{\{(P_H, G_H); (P_L, G_L)\}} \lambda[V(G_H) - P(G_H)] + (1 - \lambda)[V(G_L) - P(G_L)].$$

s.t.

$$P(G_H) - c_H G_H \geq P(G_L) - c_H G_L \tag{1}$$

$$P(G_L) - c_L G_L \geq P(G_H) - c_L G_H. \tag{2}$$

$$P(G_H) - c_H G_H \geq 0 \tag{3}$$

$$P(G_L) - c_L G_L \geq 0. \tag{4}$$

We note that Eqs. (1) and (2) describe the situations in which the differences between the owner–manager's type and the company's type result in different levels of corporate governance provisions, whereas Eqs. (3) and (4) mean that the owner–manager prefers the evaluation of his company under corporate governance if the action will yield him a utility level superior to the status quo, which is assumed to be zero. The behavior of enforcing corporate governance thus gives the owner–manager a utility U by satisfying his participation constraints; otherwise, he will do nothing to enhance the company's stock price. We hence define the first-best share value (subscripted as FB, e.g. $V(G_H^{FB}) = P(G_H^{FB})$ and $V(G_L^{FB}) = P(G_L^{FB})$) as the behavior of rewarding outside investors with a value that is consistent with the behavior by which outside investors evaluate company shares under corporate governance.

It is unavoidable for outside investors to face the cost caused by the owner–manager in enforcing corporate governance. This reveals that outside investors rely on the owner–manager to enforce corporate governance provisions, but they can only get a sub-optimal share price (subscripted as SB, e.g. $V(G_H^{SB})$ and $V(G_L^{SB})$). To ensure that the owner–manager will protect outside investors, the latter must pay different stock prices for companies with different levels of corporate governance provisions. In other words, the cost c of enforcing corporate governance is associated positively with outside investors' evaluation of stock price P and corporate governance G , if we explain G as being the corporate governance provisions directed by the owner–manager.

We thus derive the different stock prices that the owner–manager rewards outside investors by enforcing different levels of corporate governance provisions. Enforcing a higher level of corporate governance provisions, the owner–manager gets a higher utility of $U_H = \Delta c G_L^{SB}$ with a higher company share value $P(G_H^{FB}) = U_H + c_H G_H^{FB}$, since the first-best governance provisions $G_H^{SB} = G_H^{FB}$ are enforced. However, by enforcing a lower level of corporate governance provisions $G_L^{SB} < G_L^{FB}$, the owner–manager does not get a higher utility – that is, $U_L = 0$, because his company share value $P(G_L^{SB}) = c_L G_L^{SB}$ is lower due to the incomplete mechanism of corporate governance.

As the levels of governance provisions play the role of an investor protection structure, higher stock prices seem to be outside investors' evaluation of how well the owner–manager enforces a higher level of corporate governance provisions. This leads to Proposition 1.

Proposition 1. *A higher company value and managerial utility level appear for companies with a higher level of enforced corporate governance provisions than for those with a lower level of corporate governance provisions, due to the evaluation of outside investors.*

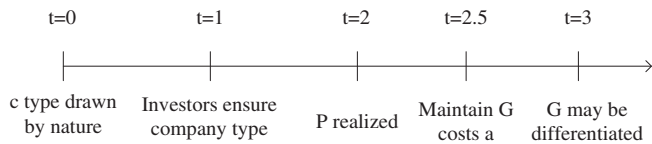
To further analyze the situation with corporate governance provisions and information disclosed, we attribute the effect of corporate governance on managerial reward with both incentive and audit. The effects of incentive and audit function differently. The former sometimes induces the manager to make voluntary disclosures for the incentive reward. The latter on the other hand protects outside investors by mandatory disclosures from a pessimistic point of view. This presumption arises from Ghosh (2007) and Holt and DeZoort (2009). It could be that moral hazard may occur when outside investors evaluate the level of corporate governance, which results in the situation drawn by Bebchuk and Neeman (2009).

The board may guess a non-observable but productive effort from the owner–manager, who may also affect the evaluation of his performance with his abilities at the same time (Drymiotis, 2008). This leads to situations that make it uneasy for shareholders to distinguish the performance between incentive and effort (Bebchuk and Neeman, 2009). As we note that the effort exerted by the owner–manager of a

company may be underestimated and reflected in the lack of efficient monitoring, there may be other factors affecting company performance and may lead to moral hazard (Chhaochharia and Grinstein, 2007). To distinguish the positive power of incentives from passive monitoring, in the next section we derive the theoretical model by splitting the discussion of efficient monitoring into two parts: incentives and audits.

3.2. Incentives

To distinguish from the original model in the above section, we denote the model in this section with 2 as a subscript. Suppose the incremental stock price in the last section respectively yields benefits $BP(G_H)$ and $BP(G_L)$ to the owner–manager. The benefits play the function of an incentive to encourage the enforcement of corporate governance by the owner–manager. The benefits from an incremental stock price depend on the owner–manager’s effort a , with the assumption that potential outside investors may buy the companies’ shares depending on this stock price.



The effort a exerted by owner–managers can be either 1 or 0, where ξ means that exerting effort to operate the company costs the owner–manager a non-monetary disutility, which is normalized as $\xi(1) = \xi$ and $\xi(0) = 0$. A risk-neutral owner–manager is only one of two potential types, c_H and c_L , and the possibility of raising the company’s stock price again $P(G_{H2})$ and $P(G_{L2})$ with respective probabilities ω and $1 - \omega$ thus depends on the owner–manager’s effort in the following discussion. Different levels of corporate governance provisions yield outside investors with differential benefits. We rewrite the outside investors’ objective function as:

$$\text{Max}_{\{(P_H, G_{H2}); (P_L, G_{L2})\}} [\lambda(V(G_{H2}) - P(G_H)) + (1 - \lambda)(V(G_{L2}) - P(G_L))] \quad (5)$$

To define this kind of effort, recall that companies with a higher level of corporate governance provisions imply that they have a better investor protection structure. In this section the scope of this effort concerns three issues: vested benefits of the incremental stock price to the owner–manager, maintaining the same level of corporate governance provisions, and the position to keep operating the company. Those issues help explain why we adopt mgr as the proxy of managerial compensation. No matter what the position the owner–manager may entail, the owner–manager owns the full expertise of running the company. Facing the challenge of independent directors, vested benefits of the incremental stock price incentivize the owner–manager to keep the position. At the same time, maintaining the same level of corporate governance provisions on the other hand creates new challenges with the expertise of board members to the owner–manager. This trade-off leads to a new dilemma for the owner–manager: risk the company or risk himself – the basis of moral hazard.

3.2.1. The vested benefits $BP(G)$ of the incremental stock price to the owner–manager

To maintain the same level of corporate governance provisions for the owner–manager’s utility, we re-derive the incentive

constraints for the owner–manager to keep operating the company as:

$$U_H = BP(G_H) + [\omega_1 P(G_{HH}) + (1 - \omega_1) P(G_{LH}) - c_H G_H - \xi] \geq \max_{a \in \{0,1\}} [\omega(a) P(G_{HL}) + (1 - \omega(a)) P(G_{LL}) - c_H G_L - \xi(a)] \quad (6)$$

$$U_L = BP(G_L) + [\omega_1 P(G_{HL}) + (1 - \omega_1) P(G_{LL}) - c_L G_L - \xi] \geq \max_{a \in \{0,1\}} [\omega(a) P(G_{HH}) + (1 - \omega(a)) P(G_{LH}) - c_L G_H - \xi(a)] \quad (7)$$

Take Eq. (6) for example. Here, U and $BP(G)$ are the respective utility and vested benefits that the owner–manager receives from enhancing stock price $P(G)$ by enforcing corporate governance. $P(G_{HH})$ shows a high stock price that remains high, while $P(G_{LH})$ shows a low stock price that becomes high. $P(G_{HL})$ shows a stock price that is high and then becomes low, whereas $P(G_{LL})$ shows a stock price that is low and remains low. Finally, $c_H G_H$ shows the level of corporate governance provisions G created by paying cost c .

Consider next whether the owner–manager is willing to exert effort a in enforcing corporate governance by disclosing information, while $\omega_1 P(G_{HH}) + (1 - \omega_1) P(G_{LH})$ is the result of stock price enhancements when owner–managers c_H and c_L try to enhance the stock price by enforcing corporate governance with respective probabilities ω and $1 - \omega$. Here, $\omega_1 P(G_{HH}) + (1 - \omega_1) P(G_{LH}) - c_H G_H$ is the difference between the cost of the owner–manager enhancing the stock price by enforcing corporate governance and the result of the stock price, which can be taken as the benefits from which the owner–manager enforces corporate governance. On the other hand, $\omega_1 P(G_{HH}) + (1 - \omega_1) P(G_{LH}) - c_H G_H - \xi$ is what the owner–manager pays to enhance the stock price by enforcing corporate governance, although the benefits of the stock price cause disutility of owner–managers. Although the enhanced stock price is a benefit for the company, the owner–manager also gets disutility. The difference between the stock price and the cost with disutility is the benefit from enhancing the stock price by enforcing corporate governance and constitutes the reason, shown as $BP(G_H) + [\omega_1 P(G_{HH}) + (1 - \omega_1) P(G_{LH}) - c_H G_H - \xi]$, for the owner–manager to be willing to enforce corporate governance.

3.2.2. Maintaining the same level of corporate governance provisions

As for the identity of the owner–manager, the enhancement of the stock price creates market value and reputation capital for both the owner–manager and the affiliated company. The incentive constraints for the owner–manager to keep the same level of corporate governance provisions are as follows:

$$P(G_{HH}) - P(G_{LH}) \geq \frac{\xi}{\Delta\omega} \quad (8)$$

$$P(G_{HL}) - P(G_{LL}) \geq \frac{\xi}{\Delta\omega} \quad (9)$$

From the above, $P(G_{HH})$ shows that the stock price is high and remains high, while $P(G_{LH})$ shows that the stock price is low and then becomes high. However, the owner–manager still has incentives to keep the same level of corporate governance provisions and enhance the stock price of the company, which costs effort to disclose information.

3.2.3. Keeping the managerial position to operate the company

The participation constraints for the owner–manager can be taken as:

$$L_{HH} = P(G_{HH}) - c_H G_H \geq 0 \quad (10)$$

$$L_{LL} = P(G_{LL}) - c_L G_L \geq 0. \quad (11)$$

Continuing to operate the company rewards the owner–manager with stock prices $P(G_{H2})$ and $P(G_{L2})$. Once the stock price of a company

with a high level of corporate provisions is expected to be greater than that of an inefficient company, it is used to measure the compensation for the owner–manager. The shareholders' problem then becomes:

$$\begin{aligned} & \text{Max}_{\{(P_H, G_{H2}); (P_L, G_{L2})\}} \omega[V(G_{H2}) - P(G_{H2})] + (1 - \omega)[V(G_{L2}) - P(G_{L2})] \\ & \text{s.t. (6) to (11)} \end{aligned}$$

With the incentive to keep the same level of corporate governance provisions, only the efficient owner–manager achieves the benefits from the incremental stock price $L_{LH} = \Delta cG_L + L_{LL}$, while the disutility of the inefficient owner–manager's effort offsets the benefits and sustains the null benefits of the non-incremental stock price ($L_{LL} = 0$). On the other hand, the efficient owner–manager still obtains compensation ($U_{H2}^{SB} = \frac{\omega\xi}{\Delta\omega} + \Delta cG_L$) and his company's value remains first-best, having the best reputation with corporate governance $G_H^{SB} = G_H^{FB}$. The owner–manager of an inefficient company is unable to get compensation $U_L = \frac{\omega\xi}{\Delta\omega}$ due to the poor stock price and also suffers from a second-best evaluation from outside investors on corporate governance $G_{L2}^{SB} < G_{L2}^{FB}$. As for companies with a lower evaluation of corporate governance, outside investors face moral hazard from an owner–manager exerting insufficient effort to enforce corporate governance as well as from other factors that result in a lower stock price. This leads to Proposition 2.

Proposition 2. *After the realization of the stock price, owner–managers of companies with a higher level of corporate governance provisions still receive higher stock price compensation. However, outside investors may face moral hazard that cannot be improved by the owner–managers.*

3.3. Audits

It seems to be a tendency lately in the literature to discuss how to complement corporate governance with auditing and monitoring. Consistent with the limited incentive effects of stock price compensation for corporate governance, Ghosh (2007) proposed that internal managerial monitoring, external auditing, and company valuation are jointly determined, with each tending to reinforce the other. Owner–managers with stockholdings are the target point of audits, which can be used as costly monitoring methods. As p denotes the probability of monitoring an owner–manager for the enforcement of corporate governance, $BP(G)$ is the benefit for an owner–manager to operate the company.

We write the incentive constraints for outside investors to induce the owner–manager to operate the company as:

$$P(G_H) - c_H G_H \geq P(G_L) - c_L G_L - p_L BP(G_H) \tag{12}$$

$$P(G_L) - c_L G_L \geq P(G_H) - c_H G_H - p_H BP(G_L). \tag{13}$$

The marginal cost of enhancing the stock price by enforcing corporate governance depends on the effort the owner–manager exerts to enforce corporate governance. Here, P is the stock price and G is the level of corporate governance provisions. Stock prices $P(G_H)$ and $P(G_L)$ will not just be affected by the level of enforcing corporate governance provisions, but will also be affected by the probability p to monitor the effort of the owner–manager in enforcing corporate governance. $P(G_H) - c_H G_H$ is taken as the benefit for the owner–manager from taking the stock price into consideration when enforcing corporate governance. $P(G_L) - c_H G_L - p_L BP(G_H)$ is the benefit for the owner–manager after taking self-benefits into consideration when enforcing corporate governance. Eq. (12) demonstrates that the utility of the owner–manager to enhance the stock price by enforcing corporate governance should be able to put pressure on the owner–manager to enforce corporate governance under monitoring, even when taking self-benefits into consideration.

When the owner–manager is willing to enforce and keep corporate governance, the participation constraints are:

$$U_H = P(G_H) - c_H G_H \geq 0 \tag{14}$$

$$U_L = P(G_L) - c_L G_L \geq 0. \tag{15}$$

Eqs. (14) and (15) demonstrate that owner–managers c_H and c_L are at least willing to enforce and keep corporate governance; otherwise, their utility is zero, as they do nothing, but keep the status quo.

To keep the same level of corporate governance provisions as that shown in the previous section, the owner–manager now faces unexpected monitoring activities. Company performance that satisfies outside investors' expectations is achieved by reviewing corporate governance provisions and exerting extra effort $c(p)$ to improve the provisions. The objective function of the owner–manager is now:

$$\text{Max}_{\{(P_H, G_H); (P_L, G_L)\}} \lambda(P(G_H) - c_H G_H - c(p_H)) + (1 - \lambda)(P(G_L) - c_L G_L - c(p_L)),$$

where the cost c of $c(p)$ increases with the probability of monitoring.

Assume that the benefits for the owner–manager can be taken back if he is not responsible for the enforcement of corporate governance. We add extra constraints for the owner–manager as the following:

$$L_H = BP(G_H) \leq P(G_L) - c_H G_L \tag{16}$$

$$L_L = BP(G_L) \leq P(G_H) - c_L G_H. \tag{17}$$

Here, $BP(G)$ presents the vested benefits for the owner–manager to enhance the stock price by enforcing corporate governance, P is the stock price, c is the cost to enforce corporate governance, and G is the level of corporate governance provisions.

Eqs. (16) and (17) demonstrate that the benefits of enhancing the stock price by enforcing corporate governance will be greater than the vested benefit of enhancing the stock price by enforcing corporate governance. This not only demonstrates the power that the owner–manager holds in enforcing corporate governance by keeping his managerial position, but also demonstrates that moral hazard may be caused by outside investors when they monitor the effort of the owner–manager to enforce corporate governance.

The outside investors' objective function is now rewritten as: $\text{Max}_{\{(V_H, G_H, p_H); (V_L, G_L, p_L)\}} \lambda(V(G_H) - c_H G_H - U_H - c(p_H)) + (1 - \lambda)(V(G_L) - c_L G_L - U_L - c(p_L)).$

Hence, when outside investors keep the same owner–manager to run the company, an extra cost will not occur to those companies with a higher level of corporate governance provisions. The reason is because the corporate governance of the companies remains high $G_H^{BP} = G_H^{FB}$, and the company value is different from those with a lower level of corporate governance provisions due to a higher stock price $V(G_H^{BP}) = G_H^{FB}$ (subscripted as FB to the right of the letters).

Different from the positive incentive of the stock price for the owner–manager when enforcing corporate governance, auditing – as a form of passive monitoring – improves outside investors' moral hazard problem. In other words, auditing and monitoring only have an impact on companies with a lower level of corporate governance provisions, because the owner–managers must pay for the cost of being audited, which enables outside investors to become familiar with bad corporate governance provisions $G_L^{BP} = G_L^{SB}$ that are reflected in the stock price. This leads to Proposition 3 as follows.

Proposition 3: Auditing has no impact on the stock price of companies with a higher level of corporate governance provisions. However, companies that cannot enhance their stock price by enforcing corporate governance can easily suffer from being audited, and this is reflected in the stock price.

4. Robustness of the model

This paper builds on a publicly-traded company, in which the owner–manager is promised a reward to protect outside investors by enforcing corporate governance. As for minority shareholders, we denote the intrinsic value of buying the company's shares as $V(G)$ and take for granted the extrinsic value of the company as its stock price $P(G)$. This enables us to use the increase in the stock price as compensation for the owner–manager. La Porta et al. (1999) stated that outside investors pay more, because they recognize that with better legal protection, more of the company's profits will come back to them as interest or dividends. Fuerst and Kang (2004) tested whether ownership structure and governance mechanisms impact company performance and shareholder wealth, showing that the benefits of a better governance system will manifest from a higher operating performance resulting in a premium on the share price. It is justifiable to fit the model with the fact that the owner–manager will sell the shares at a demanded price conditional on market information.

Studies in the literature do shed light on the power of financial incentives that keep controlling shareholders from expropriating benefits from outside investors. La Porta et al. (1999) recognized that an important source of such incentives is equity or cash flow ownership, finding that better shareholder protection is associated with a higher valuation of corporate assets, and that higher incentives from cash flow ownership are associated with higher valuations. The authors derived that a higher retained equity stake reduces expropriation, and in an equilibrium state the owner–manager pays for inefficient expropriation by receiving a lower price for the shares. Cyert et al. (2002) illuminated empirically that the pay–performance link between shareholder return and discretionary compensation is sizeable and significant, and that the efficacy of corporate governance has a greater impact on equity-based compensation relative to fixed compensation.

The owner–manager's compensation is occasionally not linked to share price performance. We thus discuss the robustness of our model if this occurs. For example, suppose the task of creating share value for an unlisted company through corporate governance provisions is delegated to the owner–manager, with the cost of profit-sharing being a salary with bonus $\pi(G)$. As this kind of compensation is an expense like any other business expense, which must be subtracted from a company's income when calculating stakeholder return, the stock price that outside investors pay when the owner–manager enforces corporate governance may be replaced by the concept of profit-sharing. If the compensation from profit-sharing is specified according to the quality of the company's corporate governance provisions, then we are still able to derive the same propositions. Since the extrinsic value of the company for the stakeholders now changes to the operating profit, stakeholders will thus care about how to ensure the owner–manager enforces and improves the company's corporate governance provisions.

If stakeholders indeed make rules on accessing the improvements of corporate governance provisions, then there may be further room to discuss what exactly causes an increase in profit-sharing. Increasing a company's profits may be due to more effort being exerted by the owner–manager, or it may be due to the company's corporate governance provisions. The former is consistent with our model whereby the owner–manager is induced by profit-sharing, when we present profit-sharing as compensation. The latter can still derive the same propositions by assuming that stakeholders are satisfied with the level of corporate governance provisions established by the owner–manager and therefore increase his profit-sharing.

5. Estimation of the theoretical models

According to the Coase theorem in economics, the process in which outside investors evaluate their companies will cost them for

that decision – that is, although outside investors invest in companies with a higher value, unexpected and illegal situations caused by the owner–manager that result in companies collapsing still exist. Using 2005–2011 data from the World Bank, we observe illegal situations of some countries in Table 1.

To empirically prove the models discussed above, we collect data from the World Bank and list definitions of related variables in the following Table 2. The variable credit functions as information disclosed, while the variable right can be taken as the regulation infrastructure of one country. They both reflect that the availability of more credit information and laws protect the rights of borrowers and lenders in one economy, respectively. We define *cg* as a percentage of firms with a legal status of a publicly listed company, thus showing individual characteristics of companies about corporate governance provisions in one country. To balance the difference of company value estimated across different countries, share appears as a variable showing the market capitalization of listed companies (% of GDP).

5.1. The corporate governance provisions for company performance

To discuss the situation in which a company has been established with corporate governance provisions, we also adopt variables of audit and owner. The former shows the percentage of firms with an annual financial statement reviewed by external auditors, but will be discussed later in the next section. The latter is the proportion of a firm held by the largest owner(s) (%), which is used to characterize the situation whereby an owner–manager operates a company.

To clearly denote the causal relationship between corporate governance provisions and company value, we first omit the effects brought by audit and owner in this section. We define *mgr* as years of experience for the top manager working in the firm's sector, which helps show the incentive function of the reward for management. However, as for the first model we discussed, this reward may lead to moral hazard as we shall presume in the next section. We only take *mgr* as a dependent variable herein to show the reward brought through a higher company value accompanied by corporate governance provisions. Finally, risk is taken as the other symbol of moral hazard to show the effects brought by audits in the next section. Table 3 shows the descriptive statistics of eight variables.

Table 1
Country characteristics.

	Credit depth of information index (0 = low to 6 = high)							
	2004	2005	2006	2007	2008	2009	2010	2011
Argentina	6	6	6	6	6	6	6	6
Armenia	0	3	3	5	5	5	5	6
Australia	5	5	5	5	5	5	5	5
Austria	6	6	6	6	6	6	6	6
Azerbaijan	0	4	4	4	5	5	5	5

	Strength of legal rights index (0 = weak to 10 = strong)							
	2004	2005	2006	2007	2008	2009	2010	2011
Argentina	4	4	4	4	4	4	4	4
Armenia	5	5	6	6	6	6	6	6
Australia	9	9	9	9	9	9	9	9
Austria	7	7	7	7	7	7	7	7
Azerbaijan	6	6	6	6	6	6	6	6

Source: World Bank, <http://data.worldbank.org/indicator>. Accessed on December 27 2012.

Notes: Credit depth of information index (0 = low to 6 = high) measure rules affecting the scope, accessibility, and quality of credit information available through public or private credit registries. The index ranges from 0 to 6, with higher values indicating the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. Strength of legal rights index (0 = weak to 10 = strong) measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 10, with higher scores indicating that these laws are better designed to expand access to credit.

Table 2
Definition of variables.

Variable	Definition	Theoretical meaning
Credit	Credit depth of information index (0 = low to 6 = high)	Information disclosed
cg	Percentage of firms with a legal status of a publicly listed company	Corporate governance provisions
Share	Market capitalization of listed companies (% of GDP)	Company value
mgr	Years of experience for the top manager working in the firm's sector	Incentive for the owner–manager
Audit	Percentage of firms with an annual financial statement reviewed by external auditors	Audit – passive monitoring
Owner	Proportion of a firm held by the largest owner(s) (%)	Moral hazard – personal level
Right	Strength of legal rights index (0 = weak to 10 = strong)	Shareholder rights
Risk	Risk premium on lending (prime rate minus treasury bill rate, %)	Moral hazard – company level

Notes: Market capitalization of listed companies (% of GDP) (also known as market value) is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. Listed companies do not include investment companies, mutual funds, or other collective investment vehicles.

Based on the preliminary situations reported in Proposition 1, this study hypothesizes the following.

Hypothesis 1. A higher level of corporate governance provisions is not associated with company value.

Hypothesis 2. A higher level of corporate governance provisions is not associated with reward for the management.

This study covers 217 countries that are developed and developing. We collect the data so as to capture countries with different levels of governance. For Proposition 1, the dependent variables in the study are share (market capitalization of listed companies) and mgr (years of experience for the top manager working in the firm's sector). We measure the level of corporate governance provisions by credit (credit depth of information index) and cg (percentage of firms with a legal status of a publicly listed company). To examine the possible causal relationship between corporate governance provisions and corporate performance, we mainly utilize the OLS estimated model for a panel set of 2005–2011 data to specify the characteristics by country level. For example, the specific effects arising from information disclosed and legal status settings may be highly correlated with the corporate-dependent variables. We present the OLS estimated model below.

$$\text{mgr}_{it} = C + \text{credit}_{it} + \varepsilon_{it} \quad (18)$$

$$\text{share}_{it} = C + \text{cg}_{it} + \varepsilon_{it} \quad (19)$$

in which:

i refers to the i^{th} country and t represents the t^{th} time point;
 C is the intercept;

Table 3
Descriptive statistics.

	N	Mean	Sd.	Min	Median	Max
mgr	157	15.8662	4.7192	16.00	0	26.00
Audit	192	48.8698	21.5999	48.50	3.00	100.00
Owner	189	80.2646	9.6648	81.00	52.00	100.00
cg	192	4.6042	8.2968	2.00	0	83.00
Credit	1260	2.8159	2.2411	3.00	0	6.00
Share	752	61.4335	69.3770	40.00	0	617.00
Right	1259	5.4099	2.4920	5.00	0	10.00
Risk	567	6.8028	9.4605	5.00	–4.00	174.00

share_{it} is the market capitalization of listed companies;
 mgr_{it} is years of experience for the top manager working in the firm's sector;
 credit_{it} is the credit depth of information index;
 cg_{it} is the percentage of firms with a legal status of a publicly listed company;
 ε_{it} is the random error term that captures all other variables.

Based on Table 4, credit has a significantly positive impact on mgr. Due to the availability of data, we do not observe the impact of credit on company value herein. If the variable credit functions as information disclosure significantly, then it has a positive impact on the enforcement of corporate governance provisions, as discussed in the next section.

On the other hand, cg has significantly positive impact on share. This is the same as the argument pointed out by Gompers et al. (2003), which is different from the results of Bauer et al. (2004) and Core et al. (2006). This is also inconsistent with the derivation of the model derived by Bebchuk et al. (2009).

In Section 3.1, we first theoretically derive that the best way for an investor to assure the return on investment from holding shares is by choosing a company with an efficient investor protection structure. We then conduct simple tests to empirically prove the relationship between corporate governance provisions and company performance. We additionally find out the positive relationship between information disclosed and the managerial reward derived by Grenadier and Wang (2005). As shown in Table 4, we observe that the effect of corporate governance provisions is significant to a company when the information disclosure is associated with managerial reward.

5.2. Incentives

From the findings above, although the owner–manager retains a fraction of control, shareholders only care about whether they are rewarded by the owner–manager enforcing corporate governance (La Porta et al., 2000b; Shleifer and Vishny, 1997). We extend this to derive the moral hazard that outside investors face when the owner–manager exerts effort to operate a company and disclose information. Outside investors may conjecture the causes of the lower stock price by questioning the effort exerted by the owner–manager on enforcing corporate governance or information disclosure, although other factors may also result in a lower evaluation of corporate governance provisions.

Based on the situations reported in Proposition 2, this study presents the next hypothesis.

Hypothesis 3. Better corporate governance and management are not associated with the cost of moral hazard.

Hypothesis 4. Higher stockholding by the management is not associated with the cost of moral hazard.

Table 4
The OLS regression of corporate governance – Proposition 1 for the situation.

Independent variable	Dependent variable	Independent variable	Dependent variable
	mgr		Share
Credit	0.77091 (4.97)***	cg	0.98166 (2.31)**
Intercept	13.54588 (23.28)***	Intercept	35.95208 (7.48)***
R ²	0.1390	R ²	0.0456
Adjusted-R ²	0.1334	Adjusted-R ²	0.0370
N	154	N	113
F	24.70***	F	5.35**

* Significance at the 1%, 5% and 10% levels is respectively denoted by ***, ** and *.
 Notes: t-statistics reported in parenthesis.

The OLS estimated model is shown as:

$$\text{credit}_{it}/\text{share}_{it} = C + \text{cg}_{it} + \varepsilon_{it} \tag{20}$$

$$\text{owner}_{it} = C + \text{credit}_{it}/\text{right}_{it} + \varepsilon_{it} \tag{21}$$

$$\text{mgr}_{it} = C + \text{credit}_{it}/\text{right}_{it} + \varepsilon_{it} \tag{22}$$

in which:

- i refers to the i^{th} country and t represents the t^{th} time point;
- C is the intercept;
- credit_{it} is the credit depth of information index;
- share_{it} is the market capitalization of listed companies;
- cg_{it} is the percentage of firms with a legal status of a publicly listed company;
- owner_{it} is the proportion of a firm held by the largest owner(s);
- right_{it} is strength of legal rights index;
- mgr_{it} is years of experience for the top manager working in the firm's sector;
- ε_{it} is the random error term that captures all other variables.

Some studies discuss the key roles that corporate law and regulations play in the relationship between corporate governance and company value (Bebchuk et al., 2009; Brown and Caylor, 2006; Gompers et al., 2003). Others argue that the impact of corporate governance on a company's long-term abnormal return is uncertain (Bhagat and Bolton, 2008; Johnson et al., 2009). In addition, shareholder reactions from encouraging owner-managers with incentives or enforcing corporate governance by law and regulations (Larcker et al., 2011) are not positive. As for this evidence, the basic situation to test incentives in Table 5 first shows that there are significant and positive relationships between information disclosed/company value and corporate governance provisions. It proves that information disclosure may complement the function of corporate governance proposed by Cormier et al. (2010).

From Table 6 it becomes interesting for us to observe the significant differences between the identities of an owner–manager as the owner and as the manager on information disclosure and corporate governance provisions. Specifically, the impacts of the owner–manager as the owner on information disclosure and corporate governance provisions are significant, but both are not positive. There does exist a positive and significant relationship between managerial reward and information disclosed, while there is a negative and significant relationship between managerial reward and the rights for outside investors.

5.3. Audits

Based on the situations reported in Proposition 3, this study offers the next hypothesis.

Table 5
The situation with incentive functions for corporate governance.

Independent variable	Dependent variable	Independent variable	Dependent variable
	cg		cg
Credit	0.86848 (3.31)***	Share	0.04642 (2.31)**
Intercept	2.02225 (2.05)**	Intercept	3.59733 (2.92)***
R ²	0.0552	R ²	0.0456
Adjusted-R ²	0.0501	Adjusted-R ²	0.0370
N	189	N	113
F	10.98***	F	5.35**

* Significance at the 1%, 5% and 10% levels is respectively denoted by ***, ** and *.

Table 6
The OLS regression – Proposition 2 for the incentive.

Independent variables	Dependent variables		Independent variables	Dependent variables	
	Credit	Right		Credit	Right
Owner	−0.07596 (−4.69)***	−0.04116 (−2.23)**	mgr	0.18029 (4.97)***	−0.04795 (−1.14)
Intercept	9.11044 (6.95)***	8.52941 (5.71)***	Intercept	0.11856 (0.20)	5.83696 (8.36)***
R ²	0.1062	0.0261	R ²	0.1390	0.0084
Adjusted-R ²	0.1014	0.0209	Adjusted-R ²	0.1334	0.0019
N	186	186	N	154	154
F	21.98***	4.96**	F	24.7***	1.29

* Significance at the 1%, 5% and 10% levels is respectively denoted by ***, ** and *.

Hypothesis 5. An audit is not associated with information disclosed.

Hypothesis 6. An audit is not associated with risk.

The OLS estimated model is shown as:

$$\text{right}_{it} = C + \text{credit}_{it}/\text{share}_{it} + \varepsilon_{it} \tag{23}$$

$$\text{audit}_{it} = C + \text{credit}_{it}/\text{risk}_{it} + \varepsilon_{it} \tag{24}$$

in which:

- i refers to the i^{th} country and t represents the t^{th} time point;
- C is the intercept;
- right_{it} is strength of legal rights index;
- credit_{it} is the credit depth of information index;
- share_{it} is the market capitalization of listed companies;
- audit_{it} is the percentage of firms with an annual financial statement reviewed by external auditors;
- risk_{it} is the risk premium on lending;
- ε_{it} is the random error term that captures all other variables.

From Table 7, we observe the positive relationship between information disclosed and shareholder rights (Gompers et al., 2003). As for public companies, it is an important condition to analyze the enforcement of corporate governance arrangements with an audit. No matter whether or not shareholders are informed of formal auditing reports from the management, the importance of protecting shareholders with legal rights is emphasized. The company value is positively and significantly associated with legal rights of shareholders (Cuñat et al., 2012). This rule is general all around the world, showing that countries with companies having a higher level of corporate governance provisions are reflected in the company value.

In Table 8 the positive relationship between audit and information disclosed is proved (Kurihama, 2007), while the positive relationship

Table 7
The situation with audit functions for corporate governance.

Independent variable	Dependent variable	Independent variable	Dependent variable
	Right		Right
Credit	4.75529 (43.06)***	Share	5.68629 (50.60)***
Intercept	0.23227 (7.57)***	Intercept	0.00780 (6.40)***
R ²	0.0436	R ²	0.0536
Adjusted-R ²	0.0428	Adjusted-R ²	0.0523
N	1258	N	724
F	57.32***	F	40.92***

* Significance at the 1%, 5% and 10% levels is respectively denoted by ***, ** and *.

Table 8
The OLS regression – Proposition 3 for the audit.

Independent variables	Dependent variables	
	Credit	Risk
Audit	0.01837 (2.45)**	-0.05484 (-1.81)*
Intercept	2.11750 (5.31)***	9.73192 (5.94)***
R ²	0.0309	0.0395
Adjusted-R ²	0.0258	0.0275
N	189	81
F	6.00**	3.29*

* Significance at the 1%, 5% and 10% levels is respectively denoted by ***, ** and *.

between company value and corporate governance provisions provides a good background for an audit from Table 7.

6. Conclusions

In this paper we first argue that the best way for an investor to assure the return on investment from holding shares is by choosing a company with information disclosed and with an efficient investor protection structure. We prove the argument theoretically and empirically. We observe that the impact of corporate governance provisions is significant to company value, while information disclosure is associated with managerial reward. By paying incentives to the owner–manager, outside investors are able to identify the maximum efficiency that a company can achieve and maximize the value of their shares with an appropriate level of investor protection. However, the impacts of an owner–manager as the owner and as the manager on information disclosure and corporate governance provisions are significant, but both are not positive. This demonstrates that stock-related managerial reward will cause moral hazard, which remains unsolved by outside investors. It thus becomes unavoidable to scrutinize the owner–manager's enforcement of corporate governance by auditing, which complements monitoring.

This paper discusses how to solve the asymmetric information faced by outside investors in the stock market through incentives and audits that examine whether the owner–manager is enforcing corporate governance. The focal point of the paper, similar to Dewatripont and Tirole (2005), is the concept of two efforts – to disclose information and to keep the position – that determine whether moral hazard exists or not. The enforcement of corporate governance provisions thus leaves some room for further research to discuss the combination of the unquantifiable quality of corporate governance with the quantifiable compensation for the owner–manager. Furthermore, whether or not the positive relationship between corporate governance and company performance can be proven through stock price compensation leaves further room for research, if the owner–manager's compensation is not necessarily linked to the share price. To curb the negative effect brought about by incentives, we make use of auditing for monitoring. We conduct empirical tests and find a higher proportion of a firm held by the largest owner(s) has negative impacts on information disclosed and shareholder rights. Hence, we leave the impacts in the implementation of corporate governance from the number of independent directors and expertise of board members as two factors for further research.

Appendix A

A.1. Derivation of Proposition 1

The objective function of outside investors:

$$\text{Max}_{\{(P_H, G_H); (P_L, G_L)\}} \lambda[V(G_H) - P(G_H)] + (1 - \lambda)[V(G_L) - P(G_L)].$$

s.t.

$$P(G_H) - c_H G_H \geq P(G_L) - c_H G_L \tag{1}$$

$$P(G_L) - c_L G_L \geq P(G_H) - c_L G_H. \tag{2}$$

$$U_H = P(G_H) - c_H G_H \geq 0. \tag{3}$$

$$U_L = P(G_L) - c_L G_L \geq 0. \tag{4}$$

The objective function of outside investors can be rewritten as:

$$\lambda[V(G_H) - c_H(G_H)] + (1 - \lambda)[V(G_L) - c_L(G_L)] - [\lambda U_H + (1 - \lambda)U_L]$$

as $U_L \geq U_H - \Delta c G_H$, inefficient (c_L)–efficient (c_H) = Δc

$$P(G_L) - c_L G_L \geq P(G_H) - c_L G_H$$

$$U_L + c_L G_L - c_L G_L \geq U_H + c_H G_H - c_L G_H$$

$$U_L \geq U_H + (c_H - c_L)G_H$$

$$U_L \geq U_H - \Delta c G_H.$$

$$U_H \geq U_L + \Delta c G_L.$$

A.2. Solution

The objective function of outside investors can be rewritten as:

$$\text{Max}_{\{(G_H); (G_L)\}} \lambda[V(G_H) - c_H(G_H)] + (1 - \lambda)[V(G_L) - c_L(G_L)] - \lambda \Delta c G_L$$

Eqs. (1) and (4) are binding.

$$\lambda V'(G_H^{SB}) = \lambda c_H, \quad V'(G_H^{SB}) = c_H$$

$$(1 - \lambda)[V'(G_L^{SB}) - c_L] = \lambda \Delta c, \quad V'(G_L^{SB}) = c_L + \frac{\lambda}{1 - \lambda} \Delta c$$

For c_H type:

$$G_H^{FB} = G_H^{SB}, \quad U_H = \Delta c G_L^{SB},$$

$$P(G_H^{FB}) = U_H + c_H G_H^{FB} = \Delta c G_L^{SB} + c_H G_H^{FB}.$$

For c_L type:

$$G_L^{FB} > G_L^{SB}, \quad U_L = 0,$$

$$P(G_L^{FB}) = U_L + c_L G_L^{FB} = c_L G_L^{SB}.$$

(Q.E.D.)

Appendix B

B.1. Derivation of Proposition 2

$$\text{Max}_{\{(P_H, G_{H2}); (P_L, G_{L2})\}} \omega[V(G_{H2}) - P(G_{H2})] + (1 - \omega)[V(G_{L2}) - P(G_{L2})]$$

s.t.

$$U_H = BP(G_H) + [\omega_1 P(G_{HH}) + (1 - \omega_1)P(G_{LH}) - c_H G_H - \xi] \geq \max_{a \in \{0,1\}} [\omega(a)P(G_{HL}) + (1 - \omega(a))P(G_{LL}) - c_H G_L - \xi(a)] \tag{6}$$

$$U_L = BP(G_L) + [\omega_1 P(G_{HL}) + (1 - \omega_1)P(G_{LL}) - c_L G_L - \xi] \geq \max_{a \in \{0,1\}} [\omega(a)P(G_{HH}) + (1 - \omega(a))P(G_{LH}) - c_L G_H - \xi(a)] \tag{7}$$

$$P(G_{HH}) - P(G_{LH}) \geq \frac{\xi}{\Delta \omega} \tag{8}$$

$$P(G_{HL}) - P(G_{LL}) \geq \frac{\xi}{\Delta\omega} \tag{9}$$

$$L_{HH} = P(G_{HH}) - c_H G_H \geq 0 \tag{10}$$

$$L_{LL} = P(G_{LL}) - c_L G_L \geq 0. \tag{11}$$

We let $\Delta\omega = \omega_1 - \omega_0$, $L_{LH} = P(G_{LH}) - c_H G_H \geq 0$, and $L_{HL} = P(G_{HL}) - c_L G_L \geq 0$.

Only Eqs. (6) and (11) are binding, while the original problem can be rewritten as:

$$\begin{aligned} \underset{\{(G_H, L_{LH}); (G_L, L_{LL})\}}{\text{Max}} \quad & \lambda \left[\omega_1 V_H(G_H) + (1 - \omega_1) V_L(G_H) - c_H G_H - L_{LH} - \frac{\omega_0 \xi}{\Delta\omega} - \xi \right] \\ & + (1 - \lambda) \left[\omega_1 V_H(G_L) + (1 - \omega_1) V_L(G_L) - c_L G_L - L_{LL} - \frac{\omega_0 \xi}{\Delta\omega} - \xi \right] \end{aligned}$$

s.t.

$$U_H = L_{HL} + \frac{\omega_0 \xi}{\Delta\omega} \geq L_{LL} + \Delta c G_L + \frac{\omega_0 \xi}{\Delta\omega} = U_L + \Delta c G_L \tag{6}$$

$$L_{LL} = P(G_{LL}) - c_L G_L \geq 0. \tag{11}$$

Derivation

Eq. (6) can be rewritten as:

$$\begin{aligned} U_H &= \omega_1 P(G_{HH}) + (1 - \omega_1) P(G_{LH}) - c_H G_H - \xi \geq \max \omega(a) P(G_{HL}) \\ &+ (1 - \omega(a)) P(G_{LL}) - c_H G_L - \xi(a) = \{\omega_1 [P(G_{HH}) - P(G_{LH})] - \xi\} \\ &+ [P(G_{LH}) - c_H G_H] \geq \{\omega(a) [P(G_{HL}) - P(G_{LL})] - \xi(a)\} + [P(G_{LL}) - c_H G_L] \\ &= \xi \left(\frac{\omega_1 - \omega_1 + \omega_0}{\omega_1 - \omega_0} \right) + L_{LH} \geq \xi \left[\frac{\omega_1(a) - \omega_1(a) + \omega_0(a)}{\omega_1 - \omega_0} \right] \\ &+ [(P(G_{LL}) - c_H G_H) + (c_L G_L - c_H G_L)] \\ &= L_{LH} + \frac{\omega_0 \xi}{\Delta\omega} \geq L_{LL} + \Delta c G_L + \frac{\omega_0 \xi}{\Delta\omega} = U_L + \Delta c G_L \end{aligned}$$

Here, $U_H = L_{LH} + \frac{\omega_0 \xi}{\Delta\omega} \geq L_{LL} + \Delta c G_L + \frac{\omega_0 \xi}{\Delta\omega} = U_L + \Delta c G_L$ (meaning that $L_{LH} \geq L_{LL} + \Delta c G_L$).

We substitute $\omega_1 P(G_{HH}) + (1 - \omega_1) P(G_{LH})$ and $\omega_1 P(G_{HL}) + (1 - \omega_1) P(G_{LL})$, respectively, with $U_H + c_H G_H + \xi$ and $U_L + c_L G_L + \xi$.

We can simplify the objective function of outside investors as:

$$\begin{aligned} \underset{\{(G_H, L_{LH}); (G_L, L_{LL})\}}{\text{Max}} \quad & \lambda \left[\omega_1 V_H(G_H) + (1 - \omega_1) V_L(G_H) - c_H G_H - L_{LH} - \Delta c G_L - \frac{\omega_0 \xi}{\Delta\omega} - \xi \right] \\ & + (1 - \lambda) \left[\omega_1 V_H(G_L) + (1 - \omega_1) V_L(G_L) - c_L G_L - L_{LL} - \frac{\omega_0 \xi}{\Delta\omega} - \xi \right] \end{aligned}$$

where:

$$\begin{aligned} L_{LH} & \Delta c G_L + L_{LL} \\ L_{LL} & 0 \\ U_H & \Delta c G_L + \frac{\omega_0 \xi}{\Delta\omega} \\ U_L & \frac{\omega_0 \xi}{\Delta\omega}. \end{aligned}$$

B.2. Solution

For c_H type:

$$G_H^{SB} = G_H^{FB}, \quad \omega_1 V'_H(G_H^{FB}) + (1 - \omega_1) V'_L(G_H^{FB}) = c_H$$

For c_L type:

$$G_L^{SB} < G_L^{FB}, \quad \omega_1 V'_H(G_L^{SB}) + (1 - \omega_1) V'_L(G_L^{SB}) = c_L + \frac{\lambda}{1 - \lambda} \Delta c.$$

(Q.E.D.)

Appendix C

C.1. Derivation of Proposition 3

The following is the owner–manager's objective function:

$$\underset{\{(P_H, G_H); (P_L, G_L)\}}{\text{Max}} \quad \lambda(P(G_H) - c_H G_H - c(p_H)) + (1 - \lambda)(P(G_L) - c_L G_L - c(p_L)),$$

where c increases with the probability of monitoring p .

s.t.

$$U_H = P(G_H) - c_H G_H \geq P(G_L) - c_H G_L - p_L BP(G_H) \tag{12}$$

$$U_L = P(G_L) - c_L G_L \geq P(G_H) - c_L G_H - p_H BP(G_L). \tag{13}$$

$$U_H = P(G_H) - c_H G_H \geq 0 \tag{14}$$

$$U_L = P(G_L) - c_L G_L \geq 0. \tag{15}$$

$$L_H = BP(G_H) \leq P(G_L) - c_H G_L \tag{16}$$

$$L_L = BP(G_L) \leq P(G_H) - c_L G_H. \tag{17}$$

$$U_H = P(G_H) - c_H G_H \geq P(G_L) - c_H G_L - p_L BP(G_H)$$

$$U_H \geq U_L + (c_L G_L - c_H G_L) - p_L BP(G_H)$$

$$U_H \geq U_L + \Delta c G_L - p_L BP(G_H) \geq 0$$

$$\Delta c G_L \geq p_L BP(G_H)$$

The outside investors' objective function under a mandate can be written as:

$$\underset{\{(V_H, G_H, p_H); (V_L, G_L, p_L)\}}{\text{Max}} \quad \lambda(V(G_H) - c_H G_H - U_H - c(p_H)) + (1 - \lambda)(V(G_L) - c_L G_L - U_L - c(p_L))$$

s.t.

$$U_H = P(G_H) - c_H G_H = \Delta c G_L - p_L BP(G_H) \geq 0 \tag{12}$$

$$U_L \geq 0. \tag{15}$$

At the optimum, we let $p_H = 0$.

Eqs. (13) and (16) are binding.

We summarize the problem in a reduced-form as:

$$\underset{\{(G_H, p_H); (G_L, p_L)\}}{\text{Max}} \quad \lambda[V(G_H) - c_H G_H - \Delta c G_L + p_L BP(G_H)] + (1 - \lambda)[V(G_L) - c_L G_L - c(p_L)]$$

s.t.

$$\Delta c G_L \geq p_L BP(G_H)$$

C.2. Solution

For c_H type:

$$G_H^{BP} = G_H^{FB}$$

$$V'(G_H^{BP}) = c_H^{FB}.$$

For c_L type:

$$G_L^{BP} = G_L^{SB}$$

$$(1 - \lambda)(V'(G_L^{SB}) - c_L) = \lambda \Delta c$$

$$V'(G_L^{BP}) = c_L^{FB} + \frac{\lambda}{1 - \lambda} \Delta c.$$

(Q.E.D.)

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