

University of Minnesota Law School

Legal Studies Research Paper Series
Research Paper No. 13-21

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Abstract:

Firms operate under a wide range of rules and regulations. These include, for example, environmental regulations (in which some industries have increased regulatory exposure) and finance and accounting (where all industries have reporting requirements). In other areas, such as antitrust cartels, enforcement is unregulated and antitrust leaves the market as the default tool to police against anti-competitive behavior. In all of these areas, detection of non-compliance by a firm can result in significant penalties. This issue of non-compliance has implications in the merger and acquisitions (M&A) context. In a transaction between an acquiring firm (buyer) and a target firm (seller), there is asymmetric information about the target's quality. In our framework, we link a target's quality directly to the strength of its regulatory compliance. In an M&A transaction, an acquirer seeks information about the target's compliance, as a compliance failure may result in substantial penalties and sanctions, post-acquisition. In the presence of quality (compliance) uncertainty about target firms, low quality targets can masquerade as high quality. This would tend to give rise to a M&A market with Lemons-like characteristics, resulting in low transactions prices and dampening of M&A activity. We examine how M&A transactions in such regulatory areas – environmental, finance and accounting, and antitrust compliance problems – might function to alleviate quality uncertainty.

Keywords: corporate compliance, corporate strategy, Lemons markets, mergers and acquisitions, environmental regulations, securities regulations, accounting, antitrust, cartels, white collar crime.

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1. Introduction

In this paper we examine markets for mergers and acquisitions (M&A) when firms are subject to myriad rules and regulations related to environmental, finance and accounting, and antitrust, among others. In a transaction between an acquiring firm (buyer) and a target firm (seller), there is asymmetric information. Our specific focus is on whether the target firm is compliant in a regulatory context. In our framework, we link a firm's quality to its regulatory compliance. In a merger and acquisition transaction, an acquirer seeks information about the target's compliance with regards to specific rules and regulations. Failure to do so may result in substantial penalties, post-acquisition.

Compliance has implications related to the M&A process, such as the purchase price and other contractual terms that shift risk between the parties. If a target is compliant (not in compliance), we consider this firm to be of high (low) quality. If the acquirer knows that the target is low quality (not in compliance), it will offer a low transaction price (or other risk shifting provisions) to compensate for potential post-acquisition monetary penalties and sanctions. In our framework, the baseline assumptions are that: (1) the target knows with certainty that it is high or low quality (that is, the firm is fully informed about whether it is in compliance or not); and (2) the acquirer may only have partial information and is uncertain about the target's quality. This presents a classic asymmetric quality information situation, with firm quality related to compliance.¹ We focus our discussion of compliance across three substantive and broadly defined regulatory fields: environmental, finance and accounting, and antitrust law.

¹ Later, we briefly discuss specific areas of compliance where, due to a firm's complex organizational and managerial structure, even the target firm itself may not know its true quality.

Regulated firms operate under an information asymmetry with its regulators. However, the one area in which the asymmetry, upon first glance, might be reduced is in the M&A context. As part of M&A deal-making, firms willingly open themselves to intensive due diligence by potential acquirers. In spite of increased due diligence, within a two to three year period after an M&A, details often emerge about regulatory risks not detected through due diligence. One recent example is the Hewlett-Packard 2011 acquisition of Autonomy, for which Hewlett-Packard paid \$11 billion but within one year wrote down \$8.8 billion because of accounting fraud on the part of Autonomy. The HP/Autonomy type story occurs often enough in the face of due diligence by investment bankers, accounting firms and law firms to suggest that detection of wrongdoing and non-compliance may be more difficult to detect than initially assumed. This persistent problem suggests that information asymmetries are significant even in the M&A context.

This is the first paper to tie the Lemons problem involving information asymmetry to the M&A context in which the information asymmetry concerns compliance. Identifying better mechanisms to reduce information asymmetries has important policy implications to: 1. Government regulation and enforcement, and 2. detection of compliance problems within the firm in the M&A context.

The paper is organized as follows. In section 2 we briefly note the Lemons problem, discuss issues related to asymmetric quality information, examine mechanisms to alleviate information asymmetries, and outline the complexities of M&A transactions when an acquirer is uncertain about a target's quality, related to regulatory compliance. We also highlight various mechanisms by which a target can credibly signal its quality to a potential acquirer. In section 3 we examine selected areas of compliance, related to environmental, finance and accounting, and

antitrust cartel behavior. In section 4 we offer some strategic considerations and in section 5 we conclude by noting and implications for M&As.

2. The Lemons Problem: Implications for M&As and Detection of Non-compliance

In this section we first elaborate on the Lemons market problem, the underlying theories of asymmetric information, quality uncertainty, and market mechanisms that may alleviate the information gaps and lead to more efficient functioning of markets. Next, we link the Lemons market literature to M&A transactions. While the academic literature has discussed the Lemons problem in the context of uncertain quality of products and services, we elaborate on the uncertain quality of the target firm by linking the firm's quality to whether or not it is in compliance with various rules and regulations that may be in place, set by Federal and/or State governments. In the context of asymmetric quality information, we discuss how the M&A transactions market has similarities and differences from the standard goods and services markets, and how the target and acquiring firms behave to address information gaps and make optimal decisions.

2.1. The Lemons problem

Adverse selection refers to a market process in which demand for high quality products are negatively affected when buyers and sellers have asymmetric information. As Stiglitz (2000) notes, there are two broad types of information where asymmetry is important: information about quality, and information about intent. Our focus is on quality. Under adverse selection, lower quality products tend to benefit because buyers are not able to differentiate between high versus low quality. This results in buyers only willing to pay an average price. Since sellers' profits are

effectively decoupled from the quality of their products, they tend to sell only low quality products. In equilibrium, the market gravitates towards low quality only. This is referred to as a Lemons Market.

The Lemons literature has considered several examples of Lemons markets, such as those for used cars and insurance. Akerlof's (1970) classic paper illustrates this problem by examining the used car market where buyers have difficulty differentiating good quality cars from bad ones. This is different from the new car market as consumers are unable to judge a car based on its brand. A top new car brand such as BMW can be low, used, quality due to the previous owner's driving habits, driving conditions, maintenance, etc. In this market, only the seller may know the exact condition (quality) of the used cars, including problems which may show up after the buyer drives the car for a while. A seller has no incentive to inform the buyer about these problems as disclosure would have a negative impact on the transactions price. Under this situation, buyers will only offer an average price as they are unwilling to take the risk of getting a low quality used car and pay a higher than the average price. In equilibrium, the market will be filled with low quality used cars because the good quality cars will not receive the price premium they deserve.

Akerlof assumes that the demand for used cars depends on the price of the used cars (P) and the average quality of the used cars (μ). D represents demand and S represents supply. Assume there are two groups of traders: groups one and two. The group one has the utility function $U_1 = M + \sum_{i=1}^n x_i$ and the group two has the utility function $U_2 = M + \sum_{i=1}^n 3/2x_i$ where M is the consumption of other goods, x_i is the quality of the i^{th} used car. When there is asymmetric information, the total demand is the sum of the demand from group one and two, and has the following structure: $D = \frac{Y_1+Y_2}{P}$, if $P < \mu$; $D = \frac{Y_2}{P}$, if $\mu < P < \frac{3\mu}{2}$; and $D = 0$, if $P > \frac{3\mu}{2}$.

The total supply is represented by $S = \frac{P}{2}N$, with average quality $\mu = \frac{P}{2}$. If $P = 2\mu$, the demand of used cars will be zero. Overall, in a market with asymmetric information, adverse selection will lead to inefficiency and reduce social welfare.

The situation is different if there is symmetric information in the market. The supply relationship is: $S = N$, if $P > 1$; and $S = 0$, if $P < 1$. The structure of demand is given by:

$D = \frac{Y_1+Y_2}{P}$, if $P < 1$; $D = \frac{Y_2}{P}$, if $1 < P < \frac{3}{2}$; and $D = 0$, if $P > \frac{3}{2}$. The equilibrium will be:

$P = 1$, if $N > Y_2$; $P = \frac{Y_2}{N}$, if $\frac{2}{3}Y_2 < N < Y_2$; and $P = \frac{3}{2}$, if $N < \frac{2}{3}Y_2$. Under symmetric information, there will be more utility gained because of the number of transactions increases compared to the market with asymmetric information.

2.1.a. Market mechanisms to alleviate the Lemons problem

To alleviate the Lemons problem, the literature has examined alternative mechanisms of exchange. When two parties in a transaction are confronted with asymmetric information, signaling serves as one of the important mechanisms to alleviate the Lemons market problem. Connelly et al. (2011) present an insightful review of the literature on signaling when two parties have asymmetric information about latent and unobservable quality. In Spence's (1973) classic paper, quality relates to the ability of a job applicant which is signaled by the level of education. In other examples, quality relates to various goods and services transacted in the market: for example, the reliability and quality of a new car, quality of workmanship of an electrician, among others. In such markets, signaling could occur via advertising,² branding,³ guarantees,⁴ certification,⁵ warranties,⁶ inspection results,⁷ among other mechanisms.

² Automobile companies like Volvo and Mercedes-Benz repeatedly tout their innovations in passenger safety. For consumers with strong preference for safety, these firms have emerged as the market leaders.

The key factors in signaling include signaler, receiver, and the signal itself. As noted in Connelly et al. (2011), signalers are insiders, who have information about an individual, product, or firm that is not easily deciphered by outsiders. Insiders have positive or negative information, and have to decide whether or not communicate the information to outsiders. There are various mechanisms that firms can use to signal quality. Connelly et al. (2011) present a review of papers and analyze the issues among signaler, signal, and receiver. They note that the signaler's characteristics may largely determine the types of signals.

There are two main characteristics of an effective signal: observability and cost. Signal observability ensures that outsiders can notice the signal. Signal costs relate to the credibility of the signal. For example, consider the ISO 9000 family of standards set by the International Organization for Standardization, relating to the eight principles of quality management systems. This is designed to help firms and organizations ensure that they meet the needs of various stakeholders, while satisfying regulatory and statutory product standards.⁸ Obtaining an ISO 9000 certificate can be costly and time consuming. The expected cost of obtaining an ISO 9000 certificate is likely to be lower for high quality firms than for low quality ones. Firms with low quality will likely need to incur significant costs and make improvements to meet the standards.

³ Effective branding can reduce quality uncertainty. For instance, there are numerous MacDonal'd's along highways in the U.S. Travelers may choose MacDonal'd's instead of competing but unknown other fast food restaurants because they know the taste and they can trust this brand.

⁴ Akerlof noted that an important way to counteract the effects of quality uncertainty are guarantees which would reduce the uncertainty when consumers are making their decisions. An example could be of stores that sell second hand luxury goods such as Louis Vuitton, Gucci, etc. Normally consumers would be reluctant to buy from them because they worry they might get something fake. A guarantee from the store that anything fake will get a 100% refund reduces the uncertainty and attracts more consumers.

⁵ For example, the National Institute for Automotive Service Excellence (ASE) works to improve the quality of vehicle repair and service by testing and certifying automotive professionals. Automotive service centers with the ASE certification, therefore, provides some quality assurance.

⁶ A manufacturer may provide warranties for a wide range of new and used durable goods, and warranties for services performed by a range of professionals.

⁷ For example, in the market for residential houses, the public disclosure of home inspection results (Taylor, 1999).

⁸ Anderson et al. (1999), Bénézéch et al. (2001), Buttle (1997), Corbett et al. (2005) and Terlaak and King (2006).

A firm that obtains an ISO 9000 certificate therefore sends a credible (having incurred the cost) and clearly observed signal.

Advertising, branding and reputation are common quality signaling mechanisms.⁹ These allow firms to attract more customers, and their effectiveness can be enhanced by sending more observable signals and/or increasing the number of signals (frequency). Higher frequency of advertisements may help reduce information asymmetry by repeatedly reminding the customers of the existence of the firm's presence and products. Frequent advertisements may be especially effective when different, but consistent, signals are used to communicate the same message. Typically, only the high quality firms with strong financial positions can afford the high cost of frequent advertising. However, if a low quality firm believes that the effectiveness is high enough to offset the cost, they may also engage in sending (false) signals. A good reputation for the firm takes time to develop and it is typically hard for new or low quality firms to imitate. Reputational quality signals are costly to develop, thereby making them more credible and resulting in reduction of information asymmetry in markets. Reputational effects, therefore, can help minimize the Lemons market problem.

In other types of mechanisms, new, younger, firms may signal quality via private equity markets. This positive signal is observable and credible. However, the signal may gain or lose strength depending on the intertemporal performance of the firm. Finally, the number of patents may be a signal for a firm to show its innovative abilities to outsiders. An innovation portfolio based signal is costly and time consuming to develop, and difficult to mimic.

In summary, the literature has typically considered two mechanisms for alleviating the inefficiencies caused by information asymmetry: signaling and screening. Informed sellers with

⁹ Kihlstrom and Riordan (1984), Nelson (1974), Dewally Ederington (2006), Weigelt and Camerer (1988), Hughes (1986), Shapiro (1982), Kirmani and Rao (2000), Erdem and Swait (1998), Connelly et al. (2011), Sporleder and Goldsmith (2001), Riley (2001) and Kremer and Skrzypacz (2007).

high quality products need to signal the quality of their products (e.g., via warranties, costly advertisement, reputation building, etc). On the other hand, uninformed buyers need to screen the high quality products from bad ones (e.g., via insurance deductibles).

2.2. The Lemons problem and M&As

In the above discussion, we examined a range of issues related to the quality of products and services offered by firms. We also noted that a firm's overall quality matters. For example, we discussed how an ISO 9000 certification signals quality of organization, managerial and production practices. In this scenario, firms with ISO 9000 certification will be viewed by markets as higher quality.

In this paper we are concerned about markets for mergers and acquisitions. In such markets, there is a transaction between an acquiring firm (buyer) and a target firm (seller). As part of this transaction, there is asymmetric information. Our specific focus is on whether the target firm is compliant in a regulatory context. Firms are subject to myriad rules and regulations related to environment, finance and accounting, and antitrust among others.

Unlike the standard product and services markets we discussed earlier, in the context of M&As, the target typically has to offer all available information to the acquirer to consummate a deal. In the area of environmental regulations, a target can offer data and information on pollution controls and results of any State and Federal inspections. Due to the specifics of EPA mandates and requirements, firms in the electric industry, for example, have to record all emissions information and this is archived and available for examination. An acquirer has access to this information. There are other industries where environmental regulations are important, but the mandates for recording and archiving information are not the same as in the electric

generation industry. Examples include various areas of automotive components, metals, cement and glass products. Therefore, for environmental compliance in general, while in some industries the information may be available to the acquirer in a more transparent manner, in other industries there may be considerable information gaps. Depending on the magnitude of the stakes involved and the specific industry, the acquiring firm can engage in costly verification to reduce this information gap.¹⁰

2.2.a. Sector regulatory dimension

The type of regulation and the intensity of enforcement is sometimes specific to particular industries. For example, chemicals, pulp and paper, electric generation and petroleum refining industries are subject to significant regulations by both Federal and State regulators as well as potential enforcement by the EPA, U.S. Department of Justice, State attorneys general and regulatory agencies, and private plaintiffs. Firms have to meet the regulatory standards or face punishment. Non-compliance with such standards means that a firm may be subject to sanctions and penalties. Table 1 displays a selection of actions initiated by the EPA under the Clean Air Act during the 2010-2012 period, along with the penalties. In some cases there is just a fine for violation, while in others there are fines plus dictates to make costly investments in installing new pollution control technologies. From Table 1, one way to think of the total penalty for violation is the amount of the fine plus mandates for installation of pollution control devices. The total penalty ranges from lows of less than \$100,000 to highs of over \$40 million. The range of industries is wide, ranging from glass products, animal feed and gravel producers, to very large manufacturing firms in petroleum refining and electric utility. Overall, Table 1 reveals that

¹⁰ The costly verification issue is akin to the information gap and credit rationing problem in borrow-lender transactions in financial markets. See, for example, Webb (1992).

there is considerable variance in total penalties and type of industries. In our M&A context, and relating quality of the firm to compliance, the wide range of penalties and industries implies that acquiring firms have to be careful in assessing a target's level of environmental compliance.

In contrast to environmental regulations, the broad area of financial and accounting compliance is more complex, and one in which significant information asymmetries can remain between the target and the acquiring firm. Costly verification by the acquirer, for example by hiring a financial-accounting firm to examine balance sheets and records, is unlikely to remove some of the important information gaps. Specific about exact accounting practices, financial transactions, insider trading, misrepresentation of costs and revenues, foreign corrupt practices, among others, are very difficult to verify. This is an area where even the target firm, depending on its organizational and managerial complexity and size, may not be fully informed about activities within the firm.¹¹

The Securities and Exchange Commission (SEC), for example, provides oversight on a range of financial and accounting regulations. Actions related to insider trading and accounting fraud are common, and encompass nearly all industries (Cumming and Johan, 201; Yu, 2013). In recent years, an important area of enforcement relates to Foreign Corrupt Practices Act (FCPA). Table 2 provides details on selected SEC and DOJ FCPA actions in recent years. The fines imposed are levied under DOJ criminal and/or SEC civil actions. The FCPA actions occur in a

¹¹ Maggi and Rodríguez-Clare (1995), for example, examine the falsification of information provided by agents to principals, and costly verification. Arguably, the more complex the firms structure, incentives for such falsification might increase, implying that even within a firm, the principal may not be fully informed about some of the compliance issues we consider. The issue of organizational structure poses significant complexity. If a target has a complex multi-product and multi-divisional structure, upper management may not be fully aware of the violations occurring in various units. Organizational design issues may contribute to illegality. Organizational design thus may signal propensity of illegality for a target firm. Because of complexity, the more complex an organizational structure of a firm, the more difficult it is to coordinate various organizational subunits. This complexity may increase agency costs (Chen and Hambrick, 1995). In turn, the agency costs of more complex organizations may increase the likelihood of illegal activity (McKendall and Wagner, 1997). Given this, the acquirer faces a significant information gap which costly verification will not narrow.

much wider cross-section of industries than those noted in Table 1 under environmental violations. Examples of industries include automobiles, food products, medical devices, military equipment, chemicals, technology consulting, among others. Column 3 (Table 2) shows that the fines levied are on average much larger than those observed in Table 1. This implies that acquiring firms have to be even more concerned about potential FCPA compliance than those in the environmental category.

Finally, Table 3 provides information on selected SEC enforcement and fines related to the more general financial and accounting areas. As with the FCPA violations, the range of industries is diverse and the fines large.

What complicates matters is that in environmental regulations, firms have to put in place numerous checks and balances on production and polluting equipment to record emissions, and these data are monitored and reported. For FCPA and other types of financial and accounting violations, potential wrongdoing can occur over a much wider range of activities and are often individual specific, making it very difficult for a firm to know whether it is compliance or not. This implies that the quality (compliance) uncertainty is even higher in the FCPA and financial-accounting areas, and a considerable risk for the acquiring firm.

Finally, the third area we consider, collusive practices, is even more complex than the above two categories. While collusion is illegal per se, there is no regulatory body (like EPA or SEC in the above examples) which have mandated standards and routine compliance requirements. Given the covert nature of collusion, even costly verification is unlikely to narrow the information gap. We provide in Table 4 an example of the air cargo cartel and US and European government imposed fines for cartel participants. The sheer number of firms engaged in the cartel and total fines levied is breathtaking. Fines collected overall in the air cargo cartel

globally across government and private enforcement efforts exceeds \$4 billion. The information on cartels and fines imposed presented in Levenstein and Suslow (2011) provide a broader look at antitrust cartels.

2.2.b. Acquirer, target and information gap

In the absence of mechanisms that reduce information asymmetry, M&A transactions would decline, just like in the classic Lemons problem. However, as in markets for goods and services, targets and acquirers have alternative channels to signal and communicate quality attributes.

In section 2.1 we discussed various strategies by firms to signal information about quality. In the case of financial and accounting compliance, a target firm may engage in costly certification procedures to convince the acquirer of its quality. In the environmental compliance area, a target can provide all Federal and State mandated compliance data. The EPA (EPA, 1998) provides protocols for compliance and liability, and a target can incur costs and use these protocols to provide credible quality assurance. An acquirer can also verify compliance based on established protocols and avail of expert services to validate. A low quality firm, one with financial, accounting or environmental compliance problems, may attempt to mimic a high quality firm, but success is not guaranteed as the acquirer can also avail of services of experts in financial-accounting and environmental certification firms to validate quality.¹² Overall, there

¹² For example, see the services provided by Environmental Compliance Services (<http://www.ecsconsult.com/>) and COMM Engineering (<http://www.commengineering.com/environmental.html>).

exist mechanisms by which a target can credibly, by incurring costs, signal quality. This reduces the information gap and facilitates M&A transactions.

In the case of antitrust collusion, verification is very difficult. Incurring costs, as in the environmental and financial-accounting cases, is unlikely to reduce the information asymmetry as to whether the target is in a cartel. The most that might be done would be the use of econometric screens to examine an entire industry. When done correctly, such screens might reduce the compliance asymmetry not merely for the particular target but for the entire industry.¹³

Compliance and enforcement risk is well understood in the M&A contracting context. There are complex representations and warranties to deal with this along with significant due diligence (Gilson and Schwartz, 2005). That is, it is possible to solve the problem of asymmetric uncertainty through contracting.

Even with contractual guarantees, deals get completed regardless of the specific provisions of such representations and warranties (short of regulatory blow up) because once parties are committed, they may want to push a deal forward. Thus, provisions that may serve to protect acquirers from a target's non-compliance are not always enforced (Manns and Anderson, 2012). This only exacerbates the Lemons problem.

2.3. Target firms and non-compliance

A firm may undertake illegal behavior and non-compliance, based on the relative costs and benefits of compliance (Helland, 1998). We have chosen three different types of compliance areas, each of which represents a different type of enforcement mechanism and complexity.

¹³ While screens might be helpful for financial buyers, they may or may not be as helpful for strategic buyers. A company might want to signal low compliance instead of high compliance. In this paper we assume that companies only wish to screen high compliance. In an extension paper, we examine signaling weak compliance.

Before exploring these three areas of law and regulation, we note generally that the legal landscape is not static and depends on changes in administration, changes in case law and regulations. Moreover, there are different kinds of violations. Some are highly technical but can be fixed relatively easily and sometimes do not need to be reported, whereas other types of compliance require a serious regulatory aspect with significant coordination and reporting to government counterparts.

As we noted in Section 2.2 above, the first area which we examine is environmental regulation. The second area is securities and accounting related fraud (including FCPA), and the third is antitrust cartels. In each of these three areas, compliance issues arise at multiple levels of government. There is some federal enforcement and some state level enforcement.

However, it is not direct government enforcement that is the primary method of compliance for firms. There has been a move away from traditional public enforcement towards privatizing enforcement in which self-regulation, self-enforcement and self-reporting of wrongdoing is playing a larger role (Ayers and Braithwaite, 1992). Self-policing is a method to optimize regulation (Innes, 1999; Kaplow and Shavell, 1994). It privatizes enforcement by pushing enforcement and compliance from the regulator to the regulated firm. Firms report their compliance failures to the government. In each of the three areas, self-policing plays a role in detection of wrongdoing and of compliance failures.

3. Selected areas of compliance and non-compliance in target firms

3.1. Creating compliance mechanisms

The creation and of internal compliance mechanisms and structures is one way in which firms attempt to regulate themselves against legal/regulatory wrongdoing. Sometimes the creation of compliance mechanisms is merely symbolic (Edelman, 1990). However, firm expenditures on compliance may suggest significant commitment to ensure that there is no corporate wrongdoing.

3.1.a. Disclosure

A firm can mitigate uncertainty of its value through disclosure. Disclosure and transparency are a signaling mechanism, as they can credibly reduce information asymmetries. The market is likely to view firms with greater environmental disclosure as being better able to manage future regulatory costs. Blacconiere and Patten (1994) find that the greater the disclosure of firms prior to an industry-wide crisis (not specific to that firm), the less severe the market reaction. Firms that perform well in their environmental compliance can signal this through better disclosure (Clarkson et al., 2008). The information is a signal not merely to existing (shareholders) but to potential acquirers.

Mandatory disclosure regimes also add transparency to a firm's activities. The disclosure of information reduces information costs for stakeholders. This has an economic impact as it may put pressure on firms to improve their performance (Chatterji and Toffel, 2010) due to an increased chance of regulatory enforcement.

3.1.b. Investment in Compliance

Companies may choose to make a significant investment in compliance. The motivation to add more rigorous compliance comes from multiple directions. More compliance may be a

function of changes in regulation and a firm's ability to arbitrage this discontinuity to its advantage over its competitors. A firm may be able to take advantage of changes in the regulatory environment to become more compliant for competitive advantage (Nehrt, 1996 and 1998) or as a result in a shift in regulatory risk assessment.

Pressure may come from outside stakeholders such as activists and non-governmental organizations. Companies might channel stakeholder concerns into a branding and reputational boost based on "good" governance and strong compliance. The greater the engagement with outside stakeholders, the greater the potential support in political and regulatory settings for companies. Companies would not seek such support unless they believed that they had dealt with compliance problems adequately. That is, stakeholder involvement is a form of political capital expenditure (Henisz et al., 2012). Such expenditure will show better returns if a company creates a compliance infrastructure to ensure that the political capital expenditures are not wasted due to poor compliance decisions.

3.2 Environmental compliance

The nature of issues that arise in the environmental context will vary across industries, with some industries more heavily regulated than others based on their environmental profile. There are a number of industries in which pollution is common. This includes industries such as electric generation, chemicals, and pulp and paper, among others.

Firms are only willing to undertake significant efforts at environmental self-compliance if in fact they will benefit from such auditing. Should significant compliance lead to increased penalties from the government, there are incentives for firms not to undertake significant compliance (Arlen, 1994; Pfaff and Sanchirco, 2000).

To a certain extent, potential acquirers are well versed in environmental due diligence and how to address it within the acquisition context. Environmental due diligence entails a review of past environmental issues, current non-compliance and the costs of getting the target firm into compliance. Environmental due diligence in the M&A context may consist of Phase I,II, III and IV site assessments and remediations.

In spite of potential due diligence, Lemons problems emerge consistently through M&A environmental transactions. Additionally, some firms may want to signal strong compliance but cannot. There is particular difficulty in valuing environmental compliance and performance because of the uncertainty of future litigation and regulatory costs as well as because of agency cost problems within the firm (Ambec and Barla, 2002; Reinhardt, 2000).

3.2.1. Firm Structure

The structure of corporate governance of a firm may be an indicator of compliance with environmental issues. Walls et al. (2012) show relationships regarding smaller and more diverse boards leading to better environmental performance (with performance being based on environmental violations). They also found that firms with highly compensated CEOs tend to have worse environmental records. Other work suggests that the likelihood of being named a defendant in an environmental lawsuit increases with the size of the board, the percent of members of the board of directors from industrial firms, and with the percentage of insider ownership in the firm, whereas it decreases with an higher percentage of outside directors (Kassinis and Vafeas, 2002).

Conformity of environmental compliance policies across different subsidiaries of the firm may signal compliance strength. Firms who make acquisitions in countries with lower

environmental standards but who use the same compliance standard globally enhances firm value as measured by Tobin's Q (Dowell et al., 2000). Other empirical work suggests that it pays to be a highly compliant firm on environmental issues (Russo and Fouts, 1997; Porter and van der Linde, 1995).

3.2.2. Stakeholder involvement

One factor that influences target quality on environmental compliance might be broader stakeholder involvement of customers, suppliers and environmental groups (Anton and Deltas, 2004; Hillman and Keim, 2001; Berchicci and King, 2007). A number of factors may explain this relationship. The greater the investment with stakeholders the greater the likelihood that a company has less to hide, that it is constrained in its ability to commit non-compliant behavior. Firms may commit to additional monitoring expenditures. They may do so because stakeholder involvement serves as a pre-commitment device for more intense compliance. Thus, by building relationships with stakeholders a firm creates increased potential reputational damage for its future wrongdoing.

3.3 Financial and Accounting Fraud

Unlike environmental regulation, in which the risk of non-compliance is more likely to be industry specific, the issue of accounting fraud and related issues such as bribery (FCPA) relate to companies across all industries. By its nature, accounting is highly regulated. All publicly traded firms have reporting requirements and spend significant resources on both internal and external (accounting and law) compliance functions.

The Lemons problem may be significant in terms of accounting compliance. An acquirer's ability to get accurate financial information about the target is essential to making a merger's success. Yet, M&A of publicly traded targets tend to be wealth destroying or wealth neutral (Andrade et al., 2001).¹⁴ Notwithstanding these other issues regarding poor decision-making that motivates M&A, if the quality of financial reporting is poor, this is a compliance problem and it may lead to poor evaluation of a target firm (Aboody et al., 2005). To overcome the Lemons problem, target firms can signal compliance quality by opening themselves up to potential acquirers to help reduce information asymmetries (Eso and Szentes, 2007). In other situations, poor financial reporting may lead to situations of a winner's curse (Barberis and Thaler, 2006).

Economic incentives may be such that a manager might cover up an accounting problem for gain. However, in the long term the accounting irregularities often are found and non-compliance punished. Accounting frauds tend to be discovered when "gains" can no longer be sustained. The same type of concerns of fraud also emerges in other areas of regulation of financial information, such as the FCPA.

3.3.1. Firm Structure

Corporate governance and various incentives structures may explain the probability of wrongdoing for securities/accounting issues. Good corporate governance provides a signal of a higher quality firm regarding compliance. For example, a higher percentage of independent outside directors positively correlates to a lower corporate fraud (Beasley, 1996 and 2000; Uzun et al., 2004) as well as opportunistic grants of stock options (Bebchuk et al., 2010).

¹⁴ This paper does not consider that empire building is the motivation for the investment and that regardless of the Lemons problem, firms will sacrifice profit for size (Williamson, 1964; Jensen, 1993).

The amount of pay for performance may be another signal of the potential risk of accounting compliance problems of a target firm. In some cases pay for performance better aligns managers' incentives with those of the firm (Baber et al., 1996; Morgan and Poulsen, 2001). However, too much short-term gain may increase the agency costs within a firm (Bebchuk and Fried 2004).

Non-linearities in payoffs may encourage fraud. CEOs whose pay is significantly incentive-based are more likely to commit fraud by misreporting material information or manipulating earnings (Berhstresser and Phillippon, 2006; Peng and Roel, 2008; Johnson et al. 2009; Burns and Kedia, 2006; Schnatterly, 2003). CFO bonuses and stock options have also been empirically linked to manipulation of earnings (Oberholzer-Gee and Wulf, 2012).

3.3.2 Stakeholder involvement

Stakeholder involvement in the securities/fraud context allows firms to signal to investors engagement between a firm and its stakeholders. Corporate social responsibility efforts are attempts by firms to show that they have goals other than a narrow profit maximizing one. However, most of the CSR movement focuses on issues such as environmental, labor and human rights concerns rather than on discussions with stakeholders about corporate accounting wrongdoing. To the extent that there is engagement with the CSR movement, corporations feel pressure to conform to CSR demands (Aguilera et al., 2007). In the corporate governance arena, these demands include "better" corporate governance that reduces incentives of individuals within firms to maximize profit. To the extent that CSR creates incentives within the firm to reduce moral wrongdoing, then firms with increased engagement with CSR groups should be

those that have higher quality governance since they have less to hide than firms that engage in accounting and FCPA non-compliance.

3.4. Cartels

A cartel involves price fixing, market allocation, or bid rigging and involves collusion to multiple firms in a market. The cartel members in effect set a price above the market price to secure monopoly rents. Unlike environmental or accounting issues, cartel enforcement is highly unregulated. Antitrust leaves the market as the default tool to police against anti-competitive behavior (Hovenkamp, 2006). Because the market is the default in antitrust, there is no periodic reporting requirement akin to environmental or securities law. When firms reap illegal monopoly profits (such as through cartel behavior) that antitrust enforcement may be triggered (Blair and Knight, 2013; Dnes, 2013).

Collusion and cartel participation may happen within a stable industry. However, cartel activity also may occur as a consequence of a merger. The DOJ/FTC 2010 Horizontal Merger Guidelines set out the possibility of illegal coordinated effects post-merger of remaining firms in an industry, noting that “Coordinated interaction can involve the explicit negotiation of a common understanding of how firms will compete or refrain from competing. Such conduct typically would itself violate the antitrust laws.” In other cases, it is the M&A itself in which an acquirer fails to detect that the target firm is part of a cartel.

Cartel compliance is different from other forms of compliance for which there are criminal sanctions such as environmental or securities regulation. Unlike other areas of white collar crime, antitrust does not allow for penalty mitigation for an effective compliance program as contemplated under the US Sentencing Guidelines (Sokol, 2013). In cartel enforcement, a

company must plead guilty as part of its settlement. In other areas of white collar crime, a firm will not enter a guilty plea but instead will enter into a deferred prosecution agreement or non-prosecution agreement so as not to admit wrongdoing.

Cartel participation is difficult to detect and punish (Combe and Monnier, 2011, Connor and Lande, 2012). The low level of detection and punishment may affect the risk/reward calculation of a particular manager to participate in a cartel. The small number of people needed in a given firm to participate in a cartel also means that across firms, cartel conduct can be coordinated across a small set of players. As a result, companies often do not sufficiently invest in antitrust cartel compliance. Therefore, companies are not well tasked to deal with this detection threat even if the penalties when detected can be severe, such as the \$4 billion in penalties collected thus far globally for air cargo cartel.

The discussion of the air cargo cartel provides an example of how antitrust penalties for cartel behavior work. Under the Sherman Act, US antitrust law provides for a mix of criminal and civil penalties. These penalties are at both the firm and individual level. The air cargo cartel (which was actually a number of cartels depending on the particular country market involved) provides an example of the compliance failures on a massive scale given the number of large and sophisticated companies involved in the cartel. Table 4 contains details of the firms involved and government fines levied in Europe and the United States. Globally this cartel included many of the world's largest air cargo companies. The cartel lasted for seven years (2000-06) and included a period of consolidation of airlines in which none of the M&A due diligence detected the cartel activity.

3.4.1. Leniency and cartel compliance

DOJ Antitrust through the “corporate leniency program” relies upon self reporting by firms to reveal the existence of cartels. To encourage cartel defection by a cartel member, many antitrust authorities around the world have created incentives for “leniency” for firms to self-report cartel activity. The first firm in a cartel to do so is the leniency applicant and receive reduced penalties. The leniency program is a classic prisoner’s dilemma. The leniency applicant receives amnesty from criminal prosecution and a reduction from treble to single damages if it cooperates with DOJ Antitrust. Other cartel members may receive reduced financial penalties if they provide additional information to DOJ Antitrust which results in detection of other cartels, under a program known as Amnesty Plus. Most cartels are detected through the leniency program (Sokol, 2013).

From the standpoint of compliance, the application of the leniency program does not reward the adoption of a strong anti-cartel compliance program.¹⁵ DOJ Antitrust views a leniency request as failed compliance because the firm was involved in a cartel. Normally, the rationale for such a penalty reduction for self reporting is to encourage companies to undertake self regulation and be rewarded for creating a compliance infrastructure that promotes good governance. The penalty reduction allows for an optimal blend of strict liability and negligence to ensure that firms have enough incentive to invest in compliance programs (Arlen and Kraakman, 1997; Arlen, 1994). Thus, the leniency program utilizes a strict liability regime for determining punishment.

3.4.2. Firm Structure

¹⁵ Outside of the antitrust area, a compliance program also may be (at least in part) a basis for a decision not to charge under the operative DOJ charging discretion memos. See US Department of Justice and US Securities and Exchange Commission, FCPA: A Resource Guide to the US Foreign Corrupt Practices Act (Nov. 14, 2012), <http://www.sec.gov/spotlight/fcpa/fcpa-resource-guide.pdf>.

Often bonuses are tied to performance, and successful collusion can reward individuals for this reason. The opposite might, however, be even more important - fear of being fired for poor performance makes a mid-level manager who is in fear of losing his/her job is what causes them to collude. Adding to the profit motive for collusion, there might be a contractual undertaking by firms (where this is not outlawed) to pay the penalties levied on individual employees for their participation in cartel activity. This may be in the form of informal contracting for jurisdictions where such formal contracts may be illegal.

There is very little academic work on firm incentives and firm structure specific to cartels. While there is some literature on incentives for managerial effort and industry competition (Scharfstein, 1988; Schmidt, 1997), the literature on firm structure and incentives in the cartel context is small. The empirical work to date on managerial incentives and cartels analyze managerial compensation among 796 Japanese firms from 1968 to 1992 (Joh, 1999) and a sample of German firms involved in coal cartels from 1881-1913 (Burhop and Lubbers, 2009).

Some theoretical work, such as Aubert (2007), analyzes the interaction of managerial incentives with efforts at collusion. In this model, collusion may substitute for increased managerial effort. Due to incentives to collude, firms may behave inefficiently which creates even more incentive to collude, since firms cannot easily control the actions of their employees. In other theoretical work, Spagnolo (2000) provides a binding contract from the firm to the manager to support tacit collusion. In further work, Spagnolo (2005) suggests that a firm might hire a manager with a preference for income smoothing, thus creating an incentive to “meet the numbers” via a cartel.

Two recent theoretical works offer some policy solutions. Angelucci and Han (2010) suggest that for a cartel compliance program to be effective, managerial sanctions need to be

low. Buccirossi and Spagnolo (2008) argue that cartel enforcement should change managerial incentives via financial penalties to shareholders through a dilution of shares so that if managers. Thus, if firms undertake cartel activity through poorly aligned incentives, shareholders would be punished.

3.4.3. Stakeholder Involvement

Because antitrust is not regulatory in nature, there is not the type of stakeholder involvement with firms within antitrust akin to environmental or securities related issues. Moreover, the problem of cartels is one in which all of the major players of an industry are by definition parties to criminal wrongdoing so that stakeholder outreach is less important as a signaling mechanism since there is no competitive advantage that such signaling can offer a firm relative to its competitors.

4. Strategic implications

Two strategic implications emerge from this paper. The first relates to public enforcement and its interplay with private enforcement. If the market via M&As can attain part or most of the compliance/enforcement objectives, what is the optimal role of Government? That is, how much direct government enforcement is appropriate to achieve greater compliance? The second strategic implication relates to firms and their governance. If a firm can change its internal managerial incentives and organizational structures to increase the likelihood of strong legal compliance, then the types of emphasis that M&A due diligence normally undertakes misses critical factors that could better spot potential legal liabilities and change bargaining dynamics in contracting in the M&A context.

5. Conclusion

This paper applies the Lemons problem to information asymmetries regarding regulatory compliance in the M&A context. We apply this model to three types of legal contexts: strong industry specific regulation (environmental), strong general regulation (accounting fraud and FCPA) and general unregulated illegal conduct (antitrust). The mechanisms for signaling high compliance to reduce information asymmetries differ in strength depending on the specific type of substantive area of regulation. We identify factors that might be used to help identify potential lemons in the M&A context.

References

Aboddy D, Hughes J, Liu J. 2005. Earnings quality, insider trading and cost of capital. *Journal of Accounting Research* 43, 651-673.

Aguilera RV, Rupp D, Williams C, Ganapathi J. 2007. Putting the S back in CSR: A multi-level theory of social change in organizations. *Academy of Management Review* 32, 836-863.

Akerlof G. 1970. The market for lemons: quality uncertainty and the market mechanism. *Quarterly Journal of Economics* 84, 488-500.

Ambec S, Barla P. 2002. A theoretical foundation of the Porter hypothesis. *Economics Letters* 75, 355-360.

Anderson S, Daly D, Johnson M. 1999. Why firms seek ISO certification: regulatory compliance or competitive advantage? *Production and Operations Management* 8, 28-43.

Andrade G, Mitchell M, Stafford E. 2001. New evidence and perspectives on mergers. *Journal of Economic Perspectives* 15, 103-120.

Angelucci C, Han MA. 2010. Monitoring managers through corporate compliance programs.

Amsterdam Center for Law & Economics, Working Paper No. 2010-14.

Anton WRQ, Deltas G, Khanna M. 2004. Incentives for environmental self-regulation and implications for environmental performance. *Journal of Environmental Economics and Management* 48, 632-654.

Arlen J. 1994. The potentially perverse effects of corporate criminal liability. *Journal of Legal Studies* 23, 833-67.

Arlen JH, Kraakman RH. 1997. Controlling corporate misconduct: a comparative analysis of alternative corporate incentive regimes. *New York University Law Review* 72, 687-779.

Aubert C. 2009. Managerial effort Incentives and market collusion. Toulouse School of Economics, Working Paper 19-127.

Ayres I, Braithwaite J. 1992. *Responsive Regulation: Transcending the Deregulation Debate*. New York: Oxford University Press.

Baber WR, Janakiraman SN, Kang SH. 1996. Investment opportunities and the structure of executive compensation. *Journal of Accounting and Economics* 21, 297-318.

Barberis N, Thaler R. 2006. A survey of behavioral finance. In *Handbook of the Economics of Finance*, Constantinides GM, Harris M, Stulz R (eds). Elsevier: New York.

Bénézech D, Lambert G, Lanoux B, Lerch C, Loos-Baroin J. 2001. Completion of knowledge Codification: An illustration through the ISO 9000 standards implementation process. *Research Policy* 9, 1395-1407.

Beasley MS. 1996. An empirical analysis of the relation between the board of director composition and financial statement fraud. *The Accounting Review* 71, 443-465.

Beasley MS. 2000. Fraudulent financial reporting: consideration of industry traits and corporate governance mechanisms. *Accounting Horizons* 14, 441-452.

Bebchuk LA, Fried J. 2004. *Pay without Performance: The Unfulfilled Promise of Executive Compensation*. Cambridge: Harvard University Press.

Bebchuk L, Grinstein Y, Peyer U. 2010. Lucky CEOs and lucky directors. *Journal of Finance* 65, 2363-2401.

Berchicci L, King A. 2007. Postcards from the edge: a review of the business and environment literature. *Academy of Management Annals* 1, 513–547.

Bergstresser D, Philippon T. 2006. CEO incentives and earnings management. *Journal of Financial Economics* 80, 511-529.

Blacconiere WG, Patten DM. 1994. Environmental disclosures, regulatory costs, and changes in firm value. *Journal of Accounting and Economics* 18, 357–377.

Blair, R.D. and Knight, T. (2013) Compliance With Corporate Policy: An Economic Approach, *Managerial and Decision Economics* (forthcoming).

Buccirossi P, Spagnolo G. 2008. Corporate governance and collusive behavior. In *Issues in Competition Law and Policy*, Collins WD (ed.), American Bar Association.

Burhop C, Lübbers T. 2009. Cartels, managerial incentives, and productive efficiency in German coal mining, 1881-1913. *Journal of Economic History* 69, 500-527.

Burns N, Kedia, S. 2006. The impact of performance-based compensation on misreporting. *Journal of Financial Economics* 79, 35–67

Buttle F. 1997. ISO 9000: marketing motivations and benefits. *International Journal of Quality and Reliability Management* 14, 936-947.

Chatterji AK, Toffel MW. 2010. How firms respond to being rated. *Strategic Management Journal* 31, 917–945.

Chen, MJ, Hambrick DC. 1995. Speed, stealth, and selective attack: how small firms differ from large firms in competitive behavior. *Academy of Management Journal* 38, 453-482.

Clarkson PM, Li Y, Richardson GD, Vasvari FP. 2008. Revisiting the relation between environmental performance and environmental disclosure: an empirical analysis. *Accounting, Organizations and Society* 33, 303-327.

Combe E, Monnier C. 2011. Fines against hard-core cartels in Europe: the myth of over-enforcement. *Antitrust Bulletin* 56, 235-276.

Connelly B, Certo T, Ireland D, Reutzel C. 2011. Signaling theory: A review and assessment. *Journal of Management* 37, 39-67.

Connor JM, Lande RH. 2012. Cartels as rational business strategy: crime pays. *Cardozo Law Review* 34, 427-490

Corbett C, Montes-Sancho M, Kirsch D. 2005. The financial impact of ISO 9000 certification in the United States: an empirical analysis. *Management Science* 51, 1046-1059.

Cumming, D. and Johan, S., Listing Standards and Fraud, *Managerial and Decision Economics* (forthcoming).

Dnes, A., Rogue Groups in Business, *Managerial and Decision Economics* (forthcoming).

Dewally M, Ederington L. 2006. Reputation, certification, warranties, and information as remedies for seller-buyer information asymmetries: lessons from the online comic book market. *Journal of Business* 79, 693-729.

Dowell G, Hart S, Yeung B. 2000. Do corporate global environmental standards create or destroy market value? *Management Science* 46, 1059-1074.

Edelman LB. 1990. Legal environments and organizational governance: The expansion of due process in the American workplace. *American Journal of Sociology* 95, 1401-1440.

Eso P, Szentes B. 2007. Optimal information disclosure in auctions and the handicap auction. *Review of Economic Studies* 74, 705-731.

Environmental Protection Agency (EPA). 1998. Protocol for Conducting Environmental Compliance Audits under the Comprehensive Environmental Response, Compensation, and Liability.

Erdem T, Swait J. 1998. Brand equity as a signaling phenomenon. *Journal of Consumer Psychology* 7, 131-157.

Gilson RJ, Schwartz A. 2005. Understanding MACs: moral hazard in acquisitions. *Journal of Law, Economics and Organization* 21, 330-358.

Henisz WJ, Dorobantu S, Nartey L. 2011. Spinning gold: The financial and operational returns to external stakeholder engagement. Wharton School, Working Paper.

Hillman AJ, Keim GD. 2001. Shareholder value, stakeholder management, and social issues: What's the bottom line? *Strategic Management Journal* 22, 125-139

Hovenkamp H. 2006. *The Antitrust Enterprise: Principle and Execution*. Cambridge: Oxford University Press.

Helland E. 1998. The enforcement of pollution control laws: Inspections, violations, and self-reporting. *Review of Economics and Statistics* 80, 41-153.

Hughes P. 1986. Signaling by direct disclosure under asymmetric information. *Journal of Accounting and Economics* 8, 119-142.

Innes R. 1999. Remediation and self-reporting in optimal law enforcement. *Journal of Public Economics* 72, 379-93.

Jensen MC. 1993. The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance* 48, 831-881

Joh SW. 1999. Strategic managerial incentive compensation in Japan: Relative performance evaluation and product market collusion. *Review of Economics and Statistics* 81, 303-313.

Johnson SA, Ryan HE, Tian YS. 2009. Managerial incentives and corporate fraud: The sources of incentives matter. *Review of Finance* 13, 115-145.

Karpoff J, Lee S, Martin G. 2012. The impact of anti-bribery enforcement actions on targeted firms. Texas A&M University, Working Paper.

Kassinis G, Vafeas N. 2002. Corporate boards and outside stakeholders as determinants of environmental litigation. *Strategic Management Journal* 23, 399-415.

Kaplow L, Shavell S. 1994. Optimal law enforcement with self-reporting of behavior. *Journal of Political Economy* 102, 583-606.

Kihlstrom R, Riordan M. 1984. Advertising as a signal. *Journal of Political Economy*, 427-450.

Kim, K. 2012. Endogenous market segmentation for lemons. *RAND Journal of Economics* 43, 562-576.

Kirmani A., Rao A. 2000. No pain, no gain: A critical review of the literature on signaling unobservable product quality,” *Journal of Marketing* 64, 66-79.

Kremer I, Skrzypacz A. 2007. Dynamic signaling and market breakdown. *Journal of Economic Theory* 133, 58-82.

Levenstein, M., Suslow V. 2011. Breaking Up Is Hard to Do: Determinants of. Cartel Duration. *Journal of Law and Economics*, 54, 455-492.

Maggi G, Rodríguez-Clare A. 1995. Costly distortion of information in agency problems. *RAND Journal of Economics* 26, 675-689.

Manns J, Anderson R. 2013. The merger agreement myth. *Cornell Law Review*, forthcoming.

McKendall MA, Wagner JA. 1997. Motive, opportunity, choice, and corporate illegality. *Organizational Science* 8, 624-47.

Moeller S, Schlingemann F, Stulz R. 2004. Firm size and the gains from acquisitions. *Journal of Financial Economics* 73, 201-228.

Moeller S, Schlingemann F, Stulz R. 2005. Wealth destruction on a massive scale? A study of acquiring-firm returns in the recent merger wave. *Journal of Finance* 60, 757-782.

Morgan AG, Poulsen AB. 2001. Linking pay to performance-compensation proposals in the S&P 500. *Journal of Financial Economics* 62, 489-523.

Nelson, Phillip. 1974. Advertising as information. *Journal of Political Economy*, 729-754.

Nehrt C. 1996. Timing and intensity effects of environmental investments. *Strategic Management Journal* 17, 535-547.

Nehrt C. 1998. Maintainability of first mover advantages when environmental regulations differ between countries. *Academy of Management Review* 23, 77-97.

Oberholzer-Gee F, Wulf JM. 2012. Earnings management from the bottom up: An analysis of managerial incentives below the CEO. Harvard Business School Strategy Unit, Working Paper No. 12-056.

Pfaff ASP, Sanchirico CW. 2000. Environmental self-auditing: setting the proper incentives for discovery and correction of environmental harm. *Journal of Law, Economics & Organization* 16, 189-208.

Peng L, Roell A. 2008. Executive pay and shareholder litigation. *Review of Finance* 12, 141-184.

Porter M, van der Linde C. 1995. Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives* 9, 97-118.

Reinhardt FL. 2000. *Down to Earth: Applying Business Principles to Environmental Management*. Boston: Harvard Business School Press.

Riley J. 2001. Silver signals: Twenty-five years of screening and signaling. *Journal of Economic Literature* 39, 432-478.

- Russo MV, Fouts PA. 1997. A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal* 40, 539-559.
- Scharfstein D. 1988. Product-market competition and managerial slack. *The RAND Journal of Economics* 19, 147-155.
- Schnatterly K. 2003. Increasing firm value through detection and prevention of white-collar crime. *Strategic Management Journal* 24, 587-614.
- Schmidt KM. 1997. Managerial incentives and product market competition. *Review of Economic Studies* 64, 191-213.
- Shapiro C. Consumer information, product quality, and seller reputation. *Bell Journal of Economics* 13, 1982, 20-35.
- Sokol D. 2013. Policing the firm. University of Minnesota Law School, Working paper.
- Spagnolo G. 2000. Stock-related compensation and product-market competition. *The RAND Journal of Economics* 31, 22-42.
- Spagnolo G. 2005. Managerial incentives and collusive behavior. *European Economic Review* 49, 1501-1523.

- Spence M. 1973. Job market signaling. *Quarterly Journal of Economics* 87, 355-374.
- Sporleder T, Goldsmith P. 2001. Alternative firm strategies for signaling quality in the food system. *Canadian Journal of Agricultural Economics* 49, 591-604.
- Stiglitz J. 2000. The contributions of the economics of information to twentieth century economics. *Quarterly Journal of Economics* 115, 1441-1478.
- Taylor C. 1999. Time-on-the-market as a sign of quality. *Review of Economic Studies* 66, 555-578.
- Terlaak A, King A. 2006. The effect of certification with the ISO 9000 quality management standard: A signaling approach. *Journal of Economic Behavior and Organization* 60, 579-602.
- Uzun H, Szewczyk SH, Varma R. 2004. Board composition and corporate fraud. *Financial Analysts Journal* 60, 33-43.
- Walls JL, Berrone P, Phan PH. 2012. Corporate governance and environmental performance: Is there really a link? *Strategic Management Journal* 33, 885-918.
- Webb D. 1992. Two-period financial contracts with private information and costly state verification. *Quarterly Journal of Economics* 107, 1113-1123.

Weigelt K, Camerer C. 1988. Reputation and corporate strategy: A review of recent theory and applications. *Strategic Management Journal* 9, 443-454.

Williamson O. 1964. *The Economics of Discretionary Behavior: Managerial Objectives in a Theory of the Firm*. Englewood Cliffs: Prentice-Hall.

Yu, X., 2013, Securities Fraud and Corporate Finance: Recent Developments, *Managerial and Decision Economics* (forthcoming).

Table 1. Selected EPA actions under Clean Air and Clean Water Acts, 2010-2013		
Year. Firm Name	Industry	Penalty
2012. Owens-Brockway Glass	Glass container	\$1.45 million
2012. Louisiana Generating	Electric utility	\$3.5 million
2012. Golden Valley Electric	Electric utility	\$115,000, and \$40 million on pollution controls
2012. Sterling Suffolk	Racing facility	\$1.25 million
2012. Adams Land and Cattle	Beef feedlot	\$145,000
2012. Sinclair Oil Corp.	Petroleum refining	\$3.844 million, and \$10.5 million on pollution controls
2012. Marathon Petroleum and Catlettsburg Refining	Petroleum refining	\$450,000
2012. Hess Corp.	Petroleum refining & gas	\$850,000, and \$45 million in new pollution controls
2012. Triad Mining	Mining	\$810,171
2012. Durand Glass Manf.	Tableware glass	\$300,000
2012. Sinclair Casper Refining	Oil refinery	\$3.97 million
2012. Dairyland Power Coop.	Electric utility	\$950,000
2012. BP Whiting	Oil and natural gas	\$8 million
2012. QEPFS Services	Natural gas services	\$3.65 million
2012. Hess Corp.	Integrated oil company	\$850,000
2012. Essroc Cement	Cement products	\$1.7 million
2011. Volbeda Dairy	Animal feed	\$30,000
2011. California Portland	Sand and gravel producer	\$1.4 million
2011. Western Refinery	Refinery	\$1.45 million
2011. Tennessee Valley Authority	Electric utility	\$10 million
2011. Northern Indiana Public Service	Electric utility	\$3.5 million
2011. Williams, ConocoPhillips	Natural gas production	\$198,000 for ConocoPhillips and \$50,000 for Williams
2011. Conoco, Navajo Refining and Montana Refining	Petroleum refining	\$1.5 million

2011. Hovensa	Petroleum refining	\$5.375 million, and \$700 million for pollution controls
2010. Murphy Oil	Oil exploration & production	\$1.25 million, and \$143 million for pollution controls
2010. Shell Chemical	Petroleum refining	\$3.3 million, and \$6 million for pollution controls
2010. Westar Energy	Electric utility	\$3 million

Notes:

1. The information on enforcement was compiled from the U.S. Environmental Protection Agency: <http://www.epa.gov/lawsregs/>

Table 2. Selected SEC and DOJ FCPA actions, 2010-2013		
Year, Type. Case Name	Industry	Penalty (\$millions)
2012, SEC Civil. Eli Lilly	Pharmaceutical	8.8
2012, SEC Civil. Allianz	Insurance and asset management	5.4
2012, SEC Civil. Tyco International	Security systems	13.7
2012, SEC Civil. Oracle Corp.	Information technology	2.0
2012, SEC Civil. Pfizer and Wyeth	Pharmaceuticals	26.4 Pfizer 19 Wyeth
2012, SEC Civil. Orthofix International	Orthopedic medical equipment	2.3
2012, SEC Civil. Former Morgan Stanley Executive	Real estate investment and fund advising	3.9
2012, SEC Civil. Warsaw	Medical devices	17.3
2012, SEC Civil. Smith & Nephew	Medical devices	16.8
2011, SEC Civil. Magyar Telekom	Telecommunications provider	59.6
2011, DOJ Criminal. Aon Corp.	Risk management and insurance	1.8
2011, SEC Civil. Former Siemens Executives	Electrical and electronics	1,600.0
2011, SEC Civil. Liquor Giant Diageo	Alcoholic beverages	3.0
2011, SEC Civil. Armor Holdings	Military safety equipment	3.7
2011, SEC Civil. Tenaris	Steel pipe products	3.5
2011, SEC Civil. Rockwell Automation	Industrial automation products	0.5
2011, DOJ Criminal. Johnson & Johnson	Healthcare	21.4
2011, SEC Civil. Converse Technology	Computer & Information Technologies	1.2
2011, SEC Civil. Ball Corp.	Metal packaging	0.4
2011, SEC Civil. IBM Corp.	Technology and consulting	2.0
2011, DOJ Criminal. Tyson Foods	Food industry	4.0
2011, SEC Civil. Maxwell Technologies	Electrical/Electronics	6.4
2010, SEC Civil. Alcatel-Lucent	Telecommunications	45.4
2010, DOJ Criminal. RAE Systems	Wireless detection systems	1.7
2010, DOJ Criminal. Panalpina, Inc.	Transportation	70.6
2010, SEC Civil. Panalpina.	Transportation	11.4

2010, DOJ Criminal. Freight Forwarders-Pride Forasol	Transportation	32.6
2010, SEC Civil. Pride International	Oil drilling	19.4
2010, SEC Civil. Universal Corp.	Tobacco	4.6
2010, DOJ Criminal. Universal Leaf Tobaccos	Tobacco	4.4
2010, SEC Civil. Royal Dutch Shell	Oil and gas	18.2
2010, DOJ Criminal. Shell Nigeria Exploration	Oil and gas	30.0
2010, SEC Civil. Tidewater	Petroleum offshore service vessels	8.3
2010, DOJ Criminal. Tidewater Marine International	Petroleum offshore service vessels	7.4
2010, DOJ Criminal. Transocean	Oil drilling	13.4
2010, SEC Civil. Transocean	Oil drilling	7.3
2010, DOJ Criminal. Daimler	Automobile	93.6
2010, SEC Civil. Daimler	Automobile	91.4
2010, SEC Civil. ENI and Snamprogetti Netherlands	Oil and gas	125.0
2010, DOJ Criminal & SEC Civil. Technip	Oil and gas engineering	240.0
2010, DOJ Criminal. Innospec	Chemicals	40.2

Notes:

1. The information on Foreign Corrupt Practices Act (FCPA) enforcement was compiled from:

(a) the U.S. Securities and Exchange Commission: <http://www.sec.gov/spotlight/fcpa/fcpa-cases.shtml>

(b) Shearman and Sterling: <http://fcpa.shearman.com/>

Table 3. Selected general SEC actions		
Year, Allegation	Firm Name	Penalty (\$ millions)
2012. Misleading investors, misrepresenting material information	BP	525
2010. Financial misrepresentations to consumers	State Street	314
2010. Ponzi scheme	Milowe Allen Brost and Gary Allen Sorensen	310
2010. Financial misrepresentations to consumers	Goldman Saks	550
2006. Financial misstatements	American International Group	800
2006. Overstatement of revenues	McAfee	50
2006. Accounting fraud	Fannie Mae	350
2006. Financial misstatements	Federal National Mortgage Assoc.	400
2005. Market timing	Bank of America	375
2005. Accounting practices fraud	Time Warner	300
2004. Market timing, late trading	Invesco	325
2004. Accounting fraud	Qwest	250
2003. Financial misstatements	WorldCom	750
2003. Financial analyst fraud	Citigroup	400
2002. Financial fraud	Xerox	10

Table 4. Air cargo cartel		
Airline name	Fine (\$ millions) U.S. Department of Justice	Fine (€millions) European Commission
Air Canada		21
All Nippon Airways	73	
Asiana Airlines	50	
British Airways	200	104
Cargolux Airlines International	119	80
Cathay Pacific Airways	60	57
China Airlines	40	
EL AL Israel Airlines	16	
EVA Airways	13	
Japan Airlines International	110	36
Korean Air Lines	300	
LAN Cargo/Aerolinhas Brasileiras	109	8
Lufthansa	0 (immunity)	0 (immunity)
Malaysia Airlines Cargo	6	
Martinair Holland	42	30
Nippon Cargo Airlines	45	
Northwest Airlines	38	
Polar Air Cargo	17	
Qantas Airways	61	9
SAS Cargo Group	52	70
Singapore Airlines Cargo	48	75
Air France/KLM	350	310

Notes: Fines are rounded off to the nearest whole number in millions.