A Comparative Empirical Investigation of Agency and Market Theories of Insider Trading

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Abstract

The paper summarizes various agency cost and market theories of insider trading propounded over the course of the perennial law and economics debate over insider trading. The paper then suggests three testable hypotheses regarding the relationship between insider trading laws and several measures of financial performance. Using international data and alternative regression specifications, the paper finds that more stringent insider trading laws and enforcement are generally associated with *greater* ownership dispersion, *greater* stock price accuracy and *greater* stock market liquidity. This set of findings provides empirical support to theoretical arguments in favor of more stringent insider trading legislation and enforcement.

I. INTRODUCTION

Early legal scholarship on insider trading (trading by corporate insiders on material, non-public information) tended to focus on the morality of insider trading. The central issue in the early academic debate was whether insider trading is fair, particularly to outside investors (see, e.g., Schotland, 1967). However, this approach lacked a rigorous theoretical framework and thus did not generate useful legal and policy prescriptions. When he proposed the controversial notion that insider trading is economically efficient, Henry Manne (1966) abruptly shifted the debate from a focus on morality to a discussion about the economics of insider trading. At the core of the law and economics debate is the question whether insider trading is economically inefficient and thus ought to be subject to government regulation, or whether it is economically efficient and thus ought not to be regulated. Scholars on one side of this debate argue that insider trading is economically efficient and therefore prohibiting it is undesirable, indeed irrational. The other side claims that insider trading is economically inefficient and therefore government regulation ought to prohibit it.

Law and economics theories of insider trading fall into two categories: *agency* theories and *market* theories of insider trading. Agency theories of insider trading focus on the impact of trading by corporate insiders on firm-level efficiency and corporate value. The manager-shareholder conflict is the core theoretical lens through which these theories address the desirability of insider trading. Those who advocate insider trading on agency grounds claim that it ameliorates the manager-shareholder conflict of interest, while those who oppose it claim that it worsens the conflict. In contrast, market theories of insider trading emphasize the broader market implications of insider trading. These

theories address insider trading's effect on market performance, e.g., liquidity and stock price accuracy.

The law and economics approach undoubtedly has advanced the academic and policy debate about insider trading. However, one of the debate's major shortcomings is that it is insufficiently grounded in empirical evidence, even though the "desirability of [regulating] insider trading is ultimately an empirical question." (Carlton and Fischel, 1983, p. 866). A related shortcoming of the law and economics debate over insider trading is that it is American-centered. Opponents of U.S. insider trading laws believe that they award special interest groups at the expense of economic efficiency (see, e.g., Haddock and Macey, 1986a, 1987). Often, these critics mechanically apply the same logic to foreign stock markets, without due regard for economic, legal and institutional differences among countries (see, e.g., Haddock and Macey, 1986b).

The role of insider trading legislation in comparative financial structure and performance is therefore an interesting empirical question. In this article, I empirically examine insider trading laws and enforcement across countries.[1] Using legal and economic data from a cross-section of countries, I find that countries with more stringent insider trading laws generally have more dispersed equity ownership, more liquid stock markets, and more informative stock prices. These findings are consistent with agency and market theories that emphasize the costs of insider trading and advocate public

[1] This work adds to the growing body of research on comparative corporate law and securities regulation. Widely cited examples of this literature include Shleifer and Vishny (1997a); La Porta, Lopez-de-Silanes, Shelifer, and Vishny (1997, 1998, 1999); Bebchuk and Roe (1999); Coffee (1999).

legislation, and are inconsistent with theories that emphasize the benefits of insider trading and oppose regulatory intervention.

The article is organized as follows. Part II reviews the law and economics literature (agency and market theories) on insider trading. In Part III, I present three testable hypotheses. Part IV describes the data and presents summary statistics. In Part V, I present and discuss the regression results. Finally, Part VI concludes and suggests potential avenues for future research.

II. THE LAW AND ECONOMICS DEBATE OVER INSIDER TRADING

Law and economics theories about insider trading fall into two main categories: *agency* theories and *market* theories.[2] *Agency* theories of insider trading analyze the effect of insider trading on the classic corporate agency problem: the manager-shareholder conflict of interest (see Jensen and Meckling, 1976). These theories assess whether insider trading ameliorates or worsens this conflict. Analyses of insider trading from this perspective are concerned primarily with the effect of insider trading on firm efficiency. In contrast, *market* theories of insider trading are concerned with the broader market implications of insider trading. These approaches to insider trading address its effect on market efficiency, as reflected in measures like stock market liquidity and stock price accuracy.[3]

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[2] Proponents and opponents of insider trading regulation often defend their arguments on both agency and market efficiency grounds. However, this categorization of the arguments is a useful organizing tool.

[3] These market features are often referred to collectively as *market integrity* (see, e.g., Bhattacharya and Daouk, 2000).

A. Agency Theories of Insider Trading

Agency theories of insider trading analyze the effects of insider trading on agency costs, as defined by Jensen and Meckling (1976).[4] If insider trading reduces (increases) the divergence between shareholders' and managers' interests, then it reduces (increases) agency costs. Law and economics proponents of unregulated insider trading argue that insider trading reduces the manager-shareholder conflict of interest. In contrast, proponents of insider trading regulation argue that insider trading exacerbates the conflict and hence increases agency costs. The central point of contention is whether insider trading is beneficial to shareholders or whether, instead, it represents an inefficient *private benefit of control* that accrues to managers at shareholders' expense.[5]

1. Insider Trading as an Efficient Compensation Mechanism

Manne (1966) argues that insider trading is economically efficient because it motivates entrepreneurial innovation. According to Manne (1966), it is difficult to compensate entrepreneurs because, unlike capitalists and salaried employees, entrepreneurs are difficult to identify in advance. Anyone from regular salaried employees to top executives may generate profitable innovations (Manne, 1966). This makes it difficult to set entrepreneurs' pay in advance. The "indeterminancy of results" is another reason why it is difficult to contract over entrepreneurial compensation:

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[4] Jensen and Meckling (1976) define *agency costs* as the sum of the shareholders' monitoring costs, the managers' bonding costs, if any, and the *residual loss*, which is the decrease in shareholders' welfare caused by the divergence between the managers' decisions and the decisions that would maximize the shareholders' wealth. Easterbrook (1985) was among the first to raise the possibility that insider trading is an agency problem.

[5] Grossman and Hart (1982) describe managers' benefits as private benefits of control.

> True innovation cannot be predicted nor its value known before it has been thought of and made effective. True innovation cannot be planned and budgeted in advance. An individual cannot be hired to perform *x* amount of entrepreneurial service. (Manne, 1966, p. 133).

Due to the dynamic nature of innovation it is virtually impossible to contract over it in advance (Manne, 1966).

Through insider trading, entrepreneurs can be rewarded in direct proportion to and contemporaneously with their innovations (Manne,1966). Entrepreneurial innovation creates valuable new information (at the most basic level, information that there has been an innovation) and the first person to know about it is the entrepreneur responsible for the innovation. She can profit by buying the company's shares before the public learns of the innovation and before their value rises to reflect the positive news. Even if the entrepreneur is wealth-constrained and thus cannot buy unlimited shares, she can "sell" this information to others (Manne, 1966). In this manner, according to Manne (1966), insider trading "readily allows corporate entrepreneurs to market their innovations," thus forging a closer link between entrepreneurial compensation and innovation (Manne, 1966, p. 138). Since it maximizes their incentives to innovate, insider trading is the best way to compensate entrepreneurs (Manne, 1966).

Carlton and Fischel (1983) recast Manne's efficient compensation thesis in the language of the economics of agency. They argue that insider trading is efficient because it reduces agency costs. According to Carlton and Fischel (1983), relying on capital and product markets to discipline managers is insufficient because these markets work imperfectly, making it relatively difficult to remove poorly performing managers. Ex

ante compensation contracts are also inadequate because they often require costly "periodic renegotiations ex post based on (imperfectly) observed effort and output." (Carlton and Fishcel, 1983, p. 869). In contrast, insider trading enables managers to update continuously their compensation in light of new information without incurring renegotiation costs (Carlton and Fischel, 1983). In this manner, insider trading increases mangers' incentives by linking their "fortunes more closely to those of the firm." (Carlton and Fischel, 1983, p. 877).

Carlton and Fischel also claim that insider trading improves the managerial labor market:

> A related advantage of insider trading is that it provides firms with valuable information concerning prospective managers. It is difficult for firms to identify those prospective managers who will work hard and not be overly risk averse in their choice of investment projects. Basing compensation in part on insider trading is one method for sorting superior from inferior managers. Because insider trading rewards those managers who create valuable information and are willing to take risks, managers who most prefer such compensation schemes may be those who are the least risk averse and the most capable. (Carlton and Fischel, 1983, pp. 871-872).

Because the ability to engage in insider trading causes the most able managers to self-select into firms that allow it, insider trading reduces both screening and monitoring costs (Carlton and Fischel, 1983).

2. Insider Trading as an Agency Problem

Proponents of insider trading regulation emphasize the rent-extraction potential of insider trading. They argue that rather than serving as an incentive-alignment device, insider trading might exacerbate agency costs (Kraakman, 1991; Klock, 1994). One way this might occur is by distorting the managerial wage-setting process (Kraakman,1991). By engaging in insider trading, managers might be able to undo any deal worked out ex ante and thus sabotage performance-based compensation schemes (Kraakman, 1991). As a result, firms might have to monitor managers' trading ex post, offsetting the presumed cost savings.[6] In addition, it is very difficult in practice to ensure that those who produce valuable information (i.e., innovations) are the only ones who are able to profit from it (Cox, 1986).[7] This non-excludability feature of insider trading benefits could generate a free-rider problem, or worse, lead to information hoarding within the firm, thus reducing insiders' incentives to innovate and ultimately firm efficiency (Haft, 1982).

Proponents of insider trading legislation also claim that allowing managers to trade on inside information might give them incentives to take on too much risk or to undertake value-reducing projects (Klock, 1994).[8] Since insider trading is more

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6 Even Carlton and Fischel, ardent proponents of deregulation, acknowledge that "[b]anning insider trading would prevent insiders from undoing compensation agreements in this manner." (Carlton and Fischel, 1983, p. 873.)

7 Cox notes that "most (U.S.) insider-trading cases have not involved those whose entrepreneurial or other managerial efforts have produced the value-increasing event that was traded upon. Instead, the defendants have been outside directors, professionals, or clerks whose assistance was used to complete the transaction, not to create it." (Cox, 1986, p. 653).

8 The ability to short-sell exacerbates this problem, by allowing insiders to benefit from trading on bad news.

profitable the more volatile are stock prices, it might encourage managers to engage in excessively risky investment behavior.[9] In addition, since managers can profit from insider trading whether the firm is performing poorly or well, insider trading increases managers' incentives to under-perform (Anabtawi, 1989; Kraakman, 1991).

B. Market Theories of Insider Trading

Independent of its firm-level agency implications, insider trading might also have external effects (Goshen and Parchomovsky, 2001; Krawiec, 2001). Market theories of insider trading address these potential effects.

1. Is Insider Trading an Efficient Disclosure Mechanism?

Corporate disclosure is beneficial but costly.[10] Opponents of insider trading legislation argue that insider trading serves as a less costly substitute for traditional means of information disclosure (Carlton and Fischel,1983). They argue that disclosure

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[9] "The option-like character of returns from insider trading rewards the selection of projects with volatile payouts, regardless of whether they have a positive or negative return on net." (Kraakman, 1991, p. 52).

[10] Information disclosure by firms has public goods-like features. Firms bear most of the costs of disclosure, but do not reap the full benefits, which are dispersed among the firm, rival firms and investors. Thus, firms might disclose less than the socially optimal amount (Arrow, 1962; Coffee, 1984; Fox, 1999). In some cases, disclosure might even be detrimental to investors by revealing too much. For example, investors in an oil company would be harmed if the firm prematurely announced that it has discovered additional reserves on land that it is buying, since that would raise the purchase price. Therefore, the socially optimal amount of disclosure lies between no disclosure and complete disclosure. Other things equal, a lower cost of disclosure will increase the amount of disclosure that a firm makes.

through insider trading is less costly because it moves prices toward their full disclosure value, without some of the costs associated with full disclosure:

> Through insider trading, a firm can convey information it could not feasibly announce publicly because an announcement would destroy the value of the information, would be too expensive, not believable, or – owing to the uncertainty of the information – would subject the firm to massive damage liability if it turned out ex post to be incorrect. (Carlton and Fischel, 1983, p. 868).

When insiders trade on the basis of private information (e.g., a new discovery, an impending merger, etc.) prices will adjust to reflect the news, but without prematurely revealing the underlying information (Carlton and Fischel, 1983).

Advocates of insider trading regulation question its utility as a cheap substitute for traditional disclosure methods on several grounds, however. First, they argue that insider trading is likely to distort managers' incentives to disclose information in a timely manner (Kraakman, 1991). Insiders' ability to profit from insider trading depends fundamentally on their superior access to information. The more that they can control the leakage of information, the more they stand to gain from insider trading. This might include hoarding information to the detriment of both price accuracy and the firm's operational efficiency (Haft, 1982).

Second, it might be difficult for outsiders to detect insiders' trades. One reason is that insiders might deliberately hide their trading, in order to "preserve their informational monopolies, even if their activities were legal" (Kraakman, 1991, p. 50):

> It will be very costly to detect an insider's trades, because he can hide his trading activity. He can buy stock in street names or through nominees (including trusts and family members); he may route orders through a chain of brokers to make tracing difficult; the list of evasive devices is long. (Kraakman, 1991, p. 50).

If insiders are able to hide their trades, insider trading will be difficult to discern and any advantage of insider trading over traditional forms of disclosure will decrease. Even if insiders do not deliberately hide their trades, they might avoid taking large positions due to risk aversion. If insiders' trades are insufficiently large, they will be undetectable and thus fail to convey new information. In addition, the more "noise" there is surrounding an inside trade, the lower its informational value (Carlton and Fischel, 1983).

Finally, insider trading opponents argue that whatever advantage it might have over traditional disclosure is probably very small. The argument for insider trading as an alternative means of disclosure is strongest when the information in question is the kind of information that managers have little ability or incentive to disclose (Kraakman, 1991).

> Familiar examples include complex or 'soft' information that cannot be communicated effectively, bad news that might embarrass incumbent managers, and good news that cannot be released directly without aiding an issuer's competitors or upsetting ongoing negotiations. (Kraakman, 1991, p. 51).

In the case of these kinds of information, insider trading might be a better way to update prices than public announcement. However, for most types of information, traditional disclosure is relatively cheap (Kraakman, 1991).

2. Insider Trading and Liquidity

Insider trading is profitable due to asymmetry of information among insiders and outsiders. On average, when an insider sells her firm's stock, she sells for more than the stock's 'true' worth and when she buys her firm's stock, she buys at less than its 'true' value (Manove, 1989). The difference between the insider's purchase or sell price and the 'true' value is the premium she receives due to having superior information relative to outsiders. This premium represents a trading cost to less informed counter-parties (Kraakman, 1991; Georgakopoulos, 1993).[11] Thus, controlling for other factors, a market characterized by pervasive insider trading might be less liquid than a market in which insider trading is less severe.[12] If information asymmetry is extreme, uninformed investors may refrain from trading altogether, making the stock market illiquid.[13]

Advocates of insider trading dismiss its potential adverse effect on liquidity. Carlton and Fischel (1983) argue that the fact that uninformed investors trade frequently implies that they are not hindered by the existence of more informed parties, whether or not the latter are insiders. That investors trade in spite of asymmetric information suggests that their trading decisions might be independent of asymmetric information,

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[11] "Informed traders 'take' part of the stock market returns from the uninformed traders….This 'taking' thus resembles a transaction cost since it can be avoided by not trading." (Georgakopoulos, 1993, p. 17).

[12] Even Carlton and Fischel, staunch opponents of banning insider trading, acknowledge that "insider trading could be detrimental to the extent it reduces liquidity." Carlton and Fischel (1983), p. 879.

[13] Akerlof (1970) first established the theoretical connection between information asymmetry and market failure, showing that markets malfunction when there is asymmetric information and may break down entirely in cases of extreme information asymmetry.

according to Carlton and Fischel (1983). Indeed, uninformed investors might trade precisely because of informed trading, which increases the accuracy of stock prices:

> That trade occurs suggests that traders either do not believe they are uninformed or realize that enough informed trading occurs for the prevailing prices to reflect most material information. (Carlton and Fischel, 1983, p. 880).

In other words, the benefits of improved price accuracy might offset the potential costs of trading against better-informed counter-parties.

Opponents of insider trading regulation argue further that some investors will always be more informed than others. "Smart brokers…cause the same problems as smart insiders. Uninformed traders who know they are uninformed should not trade in either situation." (Carlton and Fischel, 1983, pp. 879-880). Insider trading laws cannot eliminate this phenomenon. Rather, prohibiting insider trading simply redistributes (but does not reduce) the profits from informed trading from insiders to market professionals and other informed traders (Haddock and Macey, 1986b, 1987). As a result, banning insider trading will not reduce the cost of trading, opponents of insider trading regulation argue.

However, Georgakopoulos (1993) argues that prohibiting insider trading will reduce the cost of trading by increasing competition among informed traders. He argues that, because insiders have monopolistic access to information, "they extract more profits than a competitive group of informed traders." (Georgakopoulos, 1993, pp. 20-30). Banning trading by corporate insiders thus reduces the total profits of informed trading by increasing the number of informed traders and hence the degree of competition among

them. As a result, prohibiting insider trading reduces the trading costs due to informed trading without compromising price accuracy (Georgakopoulos, 1993).

Finally, critics of insider trading regulation argue that if insider trading were harmful to liquidity, firms would voluntarily prohibit it since greater liquidity is valuable (Haddock and Macey, 1986). The fact that firms do not voluntarily proscribe insider trading therefore suggests that it does not harm liquidity. However, supporters of insider trading regulation argue that the reason why firms and their shareholders do not pre-commit to ban insider trading is because greater liquidity is a public good which firms systematically under-provide:

> even if firms know the true correlation of price and transaction costs, they may still reduce transaction costs less than is socially desirable if there is a benefit to society from low transaction costs and market liquidity which firms do not enjoy (in essence, transaction costs are [a positive] externality). (Georgakopoulos, 1993, note 34, p. 69).

Because firms have insufficient incentives to provide liquidity by banning insider trading themselves, markets must rely on government regulation (Georgakopoulos, 1993; Goshen and Parchomovsky, 2001).

III. TESTABLE HYPOTHESES

Law and economics commentators on insider trading have offered little empirical evidence in support of their respective claims. In an attempt to address this shortcoming, in this section I formulate three empirical hypotheses about the relationship between insider trading law and agency costs; insider trading law and stock price informativeness; and insider trading law and stock market liquidity.

A. Agency Costs, Insider Trading Law and Ownership Concentration

The difficulty of testing competing agency theories of insider trading is probably the reason why few if any such empirical studies exist (see Easterbrook, 1985). Nevertheless, it is possible to assess the relationship between agency costs and insider trading law indirectly by examining the relationship between the latter and ownership structure.

High ownership concentration is one mechanism by which investors address agency problems that are inadequately addressed by the law (La Porta, Lopez-de-Silanes, Shleifer, and Vishny (hereafter LLSV) 1998). Although some level of ownership concentration is desirable to give managers and large shareholders proper incentives to maximize firm value (Jensen and Meckling, 1976; Shleifer and Vishny, 1986; Bhide, 1993), ownership might be inefficiently concentrated when legal protections of minority investors are weak. When investor protections are poor, small shareholders might refrain from purchasing shares due to the threat of expropriation. Indeed, LLSV (1998) demonstrate empirically that when investor protections are weak, ownership is highly concentrated.

In a theoretical model that specifically addresses insider trading, Ausubel (1990) suggests that insider trading might reduce outsiders' willingness to participate in the stock market. Ausubel (1990) defines investor confidence as "the rational belief by outsiders that their return on investment is not being diluted by insiders' trading." (Ausubel, 1990, p. 1023). His model shows that insider trading law (in particular, a

"disclose or abstain rule"[14]) increases investor confidence and encourages greater outside investment. Conversely, when insider trading is freely permitted, outsiders are discouraged due to the fear that their investments will be diluted as a result of insiders' trading (Ausubel, 1990).

Similarly, Maug (2002) demonstrates that insider trading might discourage outside ownership. In Maug's (2002) model, banning insider trading aligns the incentives of dominant and small shareholders. In particular, large shareholders are more likely to monitor managers and company performance when insider trading is prohibited. However, when insider trading is not banned, managers may bribe large shareholders not to monitor by sharing inside information on which large shareholders may profitably trade. Consequently, trading profits are an opportunity cost of monitoring for large shareholders. If these profits are sufficiently high, dominant shareholders will forego monitoring altogether and collude with managers "to conceal adverse information and protect managers' private benefits from control" as well as their own trading profits (Maug, 2002, p. [ ]). As a result, small investors will be more reluctant to invest in corporate shares when insider trading legislation is weak because the risk of expropriation by managers and dominant shareholders is high.[15]

This suggests the following testable hypothesis.

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[14] The U.S. S.E.C. first articulated the "disclose or abstain" rule in the enforcement action *In re Cady, Roberts & Co.* (40 S.E.C. 907 (1961)) as follows: "An insider in possession of material nonpublic information must disclose such information before trading or, if disclosure is impossible or improper, abstain from trading." (Bainbridge, 1999, p. 42). Several countries have adopted a similar rule.

[15] According to Maug, insider trading legislation is "a prerequisite for dispersed ownership and liquid public markets." (Maug, 2002, p. [ ]).

Hypothesis 1: Tougher insider trading laws are associated with greater outside ownership (i.e., lower ownership concentration).

Hypothesis 1 implies that countries with tougher (weaker) insider trading laws have more (less) outside ownership, other things equal.

B. Insider Trading Law and the Information Content of Stock Prices

As noted in Part II, law and economics scholars disagree about the potential impact of insider trading on stock price accuracy. Opponents of regulating insider trading argue that insider trading enhances stock price accuracy, while proponents of regulation argue that the opposite is true.

Risk arbitrageurs (informed traders) play an important role in price formation with respect to both the degree and the kind of information that is impounded into stock prices. They invest time and resources in discovering firm-specific (proprietary) information; their profits from trading against less informed parties motivate them to conduct this kind of research. At the same time, arbitrageurs' activities generate external benefits. In particular, the collective trading of many risk arbitrageurs leads to more efficient capitalization of firm-specific information into stock prices, making stock prices more informative (Grossman, 1976; French and Roll, 1986; Roll, 1988; Shleifer and Vishny, 1997b). In turn, more informative stock prices lead to a more efficient allocation of capital (Wurgler, 2000).

Weak investor protections discourage this kind of informed trading by increasing the likelihood of expropriation and therefore making arbitrage less profitable (Morck,

Yeung and Yu, 2000).[16] The ultimate effect is less informative stock prices. Weak insider trading laws might have the same effect. As Maug (2002) shows, weak insider trading laws might facilitate expropriation of outside investors by insiders and large shareholders. This risk of expropriation might discourage informed traders from investing in company-specific research, making stock prices less informative about company-specific developments (Morck, Yeung and Yu, 2000).

Insider trading might also reduce the accuracy of stock prices by reducing the level of competition in the market for information. Fishman and Hagerty (1992) demonstrate that insider trading has two potential adverse effects. The first effect is a lower total number of informed traders in the market, since "the presence of a better-informed insider deters noninsiders from acquiring information and trading." (Fishman and Hagerty, 1992, p. 107). The second effect is an uneven distribution of information; the insider has more information than the rest of the market. Together these effects reduce the amount of competition in the market and thus lead to less informative stock prices (Fishman and Hagerty, 1992).[17]

Finally, insider trading might reduce stock price accuracy by increasing corporate insiders' incentives to manipulate information disclosure in order to maximize their trading profits (Benabou and Laroque, 1992). For the foregoing reasons, insider trading

[16] For example, Khanna and Palepu (1999) argue that interlocking control in the form of business groups, which are common in markets with weak investor protections, is associated with opaque income shifting among group-affiliated firms.

[17] This argument is consistent with those made by legal scholars Kraakman (1991) and Georgakopoulos (1993).

might reduce arbitrageurs' incentives to invest in company-specific research. The ultimate result is less informed trading and thus lower capitalization of firm-specific information into stock prices. This implies the following hypothesis.

> **Hypothesis 2:** Stock prices are less informative when insider trading laws are weak.

Hypothesis 2 implies that countries with more lax (stringent) insider trading laws have less (more) informative stock prices, other things equal.

C. Insider Trading Law and Liquidity

Market microstructure studies show that information asymmetry can compromise equity market liquidity by increasing the cost of trading (Copeland and Galai,1983; Glosten and Harris,1988; Leland,1992). In Copeland and Galai (1983), dealers subsidize their losses vis-a-vis informed traders by charging liquidity traders an immediacy fee, commonly referred to as the *bid-ask spread*. The bid-ask spread is essentially the cost of trading. The greater is the degree of asymmetric information, the greater is the bid-ask spread and hence the lower is liquidity (Stoll, 1989).[18]

Since insider trading is a type of informed trading, the microstructure literature suggests that it should be associated with lower stock market liquidity, controlling for other factors. The greater the incidence of insider trading, the greater are the potential costs of trading as market makers raise bid-ask spreads to reflect the probability that they are trading against more informed corporate insiders (Georgakopoulos, 1993). Moreover,

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[18] Stoll (1989) decomposes bid-ask spreads of NASDAQ/NMS stocks into the following components: 43% due to adverse information costs, 10% due to inventory holding costs, and 47% due to order processing costs.

allowing insiders to trade freely gives them an informational monopoly (Fishman and Hagerty, 1992; Georgakopolous, 1993; Shin, 1996), leading to higher transactions costs (lower liquidity) relative to a world in which informed outsiders compete amongst themselves for trading profits (i.e., a world in which insider trading is prohibited) (Georgakopoulos,1993; Shin 1996).

This implies the following hypothesis

Hypothesis 3: The stock market is more liquid when insider trading laws are more stringent.

Hypothesis 3 implies that, other things equal, countries with tougher (more lax) laws against insider trading have more liquid (less liquid) equity markets.

In Parts IV and V, respectively, I present the data and empirical results from tests of Hypotheses 1-3.

IV. DESCRIPTION OF THE DATA

The sample consists of a cross-section of 36 countries. Their stock markets range from long-established and highly developed stock markets to newly emerging markets. Some of the markets are highly regulated, and others are only minimally regulated. In addition, the corporate laws, corporate governance structures, institutions and legal traditions of the sample countries are considerably diverse.

A. Data Sources

The data on insider trading regulation and enforcement come from several sources. To conduct the empirical tests, I construct a unique quantitative index of the stringency of insider trading law for each country based on its written insider trading laws (Gaillard, 1992; Stamp and Welsh, 1996). The insider trading index consists of five

separate binary variables. Each component of the index represents a separate element of the country's insider trading law.

The first component of the insider trading law index addresses whether tippees are legally considered to be secondary insiders and are therefore subject to the same insider trading restrictions as primary insiders. A *tippee* is a third person (a corporate outsider) who has been tipped about material, non-public information by an insider (a director, manager, employee, etc.). If tippees are prohibited from trading, the variable *tippee* equals one; otherwise, *tippee* equals zero. The law of many countries holds tippees liable for trading if they have sufficient knowledge, or reason to know, that the information they are receiving is sensitive and private, and that the person who has tipped them is a corporate insider whom the law prohibits from divulging or using such information for non-corporate purposes.[19] On the other hand, in some countries corporate outsiders are not prohibited from trading on private information received from corporate insiders.[20] I consider an insider trading law to be tougher if it forbids tippee trading.

The second component of the insider trading law variable considers whether an insider can be held liable not only for trading but also for tipping third parties (i.e., giving material non-public information to a non-insider) and/or encouraging them to trade on such information. If so, the variable *tipping* equals one; if not, it equals zero. At first glance, this variable and the *tippee* variable appear redundant. However, they are distinct considerations. *Tippee* considers the liability of third parties (corporate outsiders), while *tipping* considers the liability of insiders who tip such parties. In some countries, insiders

[19] See Table 1.

[20] See Table 1.

are liable for *tipping* outsiders, while those whom they have tipped are not liable for their subsequent trading on such information.[21] A prohibition on trading by insiders is arguably less meaningful if insiders can tip outsiders with impunity. Most countries that prohibit insider trading also prohibit insiders' tipping of outsiders.[22]

Fines or damages are the third component of the insider trading law variable. The variable *damages* equals one if monetary penalties are proportional to insiders' trading profits, and zero otherwise. Potential violators of the law will weigh the expected cost (the probability of being caught times the monetary or criminal penalty) against the expected profits from engaging in insider trading. The higher the cost, the lower the incentive to violate the law. If monetary penalties are less than proportionate to profits, their deterrent role is relatively weak, holding constant the probability of detection.[23] Of course, the probability of detection is not constant; some regimes have superior surveillance (detection) mechanisms than others. For example, the United States is undoubtedly superior to India in this regard. Unfortunately, I do not have information on countries' detection technologies.

The fourth component of the insider trading law variable indicates whether insider trading is a criminal offense. The variable *criminal* takes the value one if violation of the insider trading law is a criminal offense, and zero otherwise. The potential for criminal penalties reduces potential violators' incentive to violate the law, holding constant the

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[21] See Table 1

[22] See Table 1.

[23] When the probability of detection is very low, the monetary penalty must be set higher for efficient deterrence. See Easterbrook, 1983, pp. 292-297.

probability of detection and monetary damages. When the likelihood of detection is very low, the optimal monetary penalty is likely to be greater than the violator's net wealth. As a result, criminal prosecution potentially leading to imprisonment and other harsh sanctions might lead to optimal deterrence (Easterbrook, 1985). By making it a criminal offense, the government might be signaling that insider trading will not be taken lightly in the jurisdiction in question.[24] Insider trading is considered a criminal offense in several jurisdictions.[25]

The fifth component of the insider trading law variable addresses whether the law grants "injured" parties a private right of action.[26] The variable *private right* equals one if such a right is granted, and zero otherwise. A private right of action gives particular investors (usually those who traded contemporaneously with the insider) or the corporation access to the courts to sue insiders for trading on inside information. For example, some jurisdictions give individual investors the right to sue for monetary compensation for their alleged trading losses due to their having traded at the opposite

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[24] Criminal sanctions might also have the opposite effect, however, since in most jurisdictions criminal prosecution requires a higher standard of proof. A higher burden of proof reduces the probability of success of prosecution, other things equal.

[25] See Table 1.

[26] There is considerable debate in the United States about whether individual investors are harmed by insider trading in public stock markets. Both Carney (1987) and Wang (1981) argue that it is practically impossible to identify individuals or groups harmed by insider trading, since the cost of trading against better informed insiders is distributed across all investors. Nevertheless, in the U.S. "it has long been clear that persons who traded contemporaneously with an inside trader have a private right of action." (Bainbridge, 1999, p. 123).

end of an insider transaction. Private rights of action give private parties an incentive to enforce insider trading laws independently of any remedial action taken by the relevant regulatory authority(ies).[27] Therefore, controlling for factors like the reliability and efficiency of the court system, the availability of a private right of action possibly makes the law more effective by giving private parties an incentive to enforce it.[28]

The insider trading law index, *ITL*, is the sum of *tippee*, *tipping*, *damages*, *criminal*, and *private right*. Therefore, *ITL* takes a value from zero to five. Zero represents the most lax insider trading regime and five represents the toughest insider trading regime. In addition, I consider separately the potential sanctions for violating the law. The variable *Sanction* is the sum of *damages* and *criminal*. Information on when a country first enacted its insider trading law as well as the year of the first enforcement comes from Bhattacharya and Daouk (2002). From the latter information, I construct a dummy variable, *Enforced*, that equals one if the law has been enforced at least once by 1994, and zero otherwise.

Ownership data come from LLSV (1998). They define ownership concentration as the average ownership concentration of the three largest shareholders in the ten largest private non-financial firms in the economy. I use this variable to construct a measure of outside ownership, which I define as one minus LLSV's (1998) ownership concentration

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[27] However, Dooley (1980) argues that in reality U.S. private insider trading suits almost always follow public proceedings.

[28] Of course, there is potential for abuse and inefficient use of private rights of action, but this does not change the analysis. It merely goes to the issue of the optimal level of regulation, which is beyond the scope of this article.

measure. By this definition, outside ownership is the average share owned by all shareholders except the three largest shareholders in the ten largest private non-financial firms in the economy. As a measure of stock price informativeness, I use Morck, Yeung, and Yu's (2000) measure of stock price synchronicity, which measures the degree to which stock prices moved together in an average week in 1995. The more stock prices move together, the higher the degree of synchronicity. Greater synchronicity implies that a larger proportion of stock price movements (return variation) is explained by market-wide than by firm-specific factors, making stock prices less informative. Stock market turnover, a common measure of liquidity, is calculated as the ratio of the total value traded to total stock market capitalization in 1995. Turnover data come from the International Finance Corporation's (IFC) Emerging Stock Markets Factbook (1996).

For measures of the legal and institutional environment, I rely on LLSV (1997). I use their measures of aggregate antidirector rights, accounting standards, and legal origin. Antidirector rights and legal origins provide general measures of the quality of investor protection. Accounting standards proxy for the quality of disclosure.[29] The Data Appendix contains a detailed description of the variables used in the empirical analysis.

B. Summary Statistics

Table 1 summarizes the countries' insider trading laws. Table 1 presents each of the five individual components (*tippee*, *tipping*, *damages*, *criminal*, and *private*), the aggregate index (*ITL*), *Sanction*, the year in which the law was enacted and the year of the first enforcement. The average year of enactment is 1983, which suggests that insider

[29] "If the company has to disclose all material information to the market in a timely manner, then there is simply no space in which insiders can trade." (Maug, 2002, p. [ ])

trading regulation is a relatively recent phenomenon. In fact, the majority of the countries in the sample did not have an insider trading law prior to 1988. The United States was the earliest to prohibit insider trading, effectively in 1961. The next prohibition did not occur until 1966, when Canada enacted its insider trading law. As Table 1 shows, the overall average of the *ITL* index is 3.11, compared to a maximum score of 5 for the United States. Table 1 also presents information on enforcement. The average year of the first enforcement is 1989, roughly 6 years after the average year of enactment.

Table 1 indicates that English common law countries have the most restrictive insider trading laws, while Scandinavian countries have the most lax insider trading laws, according to the criteria considered. French and German civil law countries' insider trading laws lie between these two extremes. The French insider trading law average is closer to the common law average and the German insider trading law average is closer to the Scandinavian average. On average, common law countries enacted and enforced insider trading laws earlier than civil law countries (t-statistics of differences in means are significant at the 15% level).[30] Common law countries also tend to have more stringent insider trading laws than civil law countries. The t-statistic of the difference in means of *ITL* between common law and civil law countries is significant at the 5% level. The main causes of this difference are greater potential sanctions (criminal charges and multiple damages) and a greater incidence of private rights of action in common law

[30] However, there is no significant difference in *Enforced* (i.e., the proportion of countries that have enforced the law by 1994) between common and civil law countries.

countries.[31] These observations are consistent with the general finding of LLSV (1997, 1998) that common law countries are more protective of investors.

Table 2 presents summary statistics. Panel B presents tests of differences in means and medians between common and civil law countries. Common law countries have significantly larger stock markets than civil law countries (t-statistic and z-statistic are both significant at the 15% level). Common law countries also have better accounting standards than civil law countries (t-statistic is significant at the 5% level and z-statistic is significant at the 1% level) and greater antidirector rights (t-statistic and z-statistic are both significant at the 1% level). Outside ownership, turnover and stock price synchronicity are not significantly different between common and civil law countries, however.

Table 3 presents the coefficients of correlation among the variables. As expected, wealthier economies (as measured by GNP) have larger stock markets (as measured by market capitalization). The correlation coefficient between the log of GNP and stock market capitalization is positive and significant at the 1% level. Wealthier countries also have a higher fraction of outside ownership. The coefficient of correlation between the log of GNP and outside ownership is positive and significant at the 1% level. In addition, wealthy countries have both more liquid markets (the correlation coefficient between turnover and the log of GNP is positive and significant at the 1% level) and more

[31] I am grateful to Professor Merritt Fox for pointing out to me that there is a potential omitted variable problem related to private rights of action in that "countries that have a private right of action to support rules against insider trading probably have a quite different kind of legal system in other broader regards." I hope that by controlling for the legal system in the regressions, I am able to allay this concern somewhat.

informative stock prices (the correlation coefficient between stock price synchronicity and the log of GNP is negative and significant at the 1% level).

Stronger investor protections, in the form of greater antidirector rights, do not appear to be features unique to wealthy countries. In contrast, the correlation coefficient between the sanction measure of insider trading law and the log of GNP is positive and significant at the 5% level. That is, wealthy countries tend to have tougher insider trading sanctions. Countries that provide greater minority protections (antidirector rights) also tend to have more stringent insider trading rules.

Consistent with Hypothesis 1, outside ownership is positively and significantly correlated with both *ITL* and *Sanction* at the 1% level of significance. Outside ownership is also positively and significantly correlated with antidirector rights and accounting standards at the 5% and 1% levels of significance, respectively. Insider trading law (both *ITL* and *Sanction*) is negatively and significantly correlated with stock price synchronicity at the 5% level. Consistent with Hypothesis 2, this means that prices tend to reflect more firm-specific information in countries with more stringent insider trading laws. Finally, stock market turnover is positively and significantly correlated with insider trading law (however, only the *ITL* measure) at the 15% level, consistent with Hypotheses 3.

V. REGRESSION ANALYSIS

A. Agency Costs, Ownership Structure, and Insider Trading Law

Hypothesis 1 implies that, other things equal, countries with tougher insider trading laws have greater outside ownership, where ownership concentration is a proxy for agency costs. In this section, I present the results of regressions of outside ownership on the insider trading law variables and legal origin.

Table 4 presents the results from ordinary least squares (OLS) regressions in which the dependent variable is outside ownership. Each regression in Table 4 confirms the finding of LLSV (1997) that French civil law origin is associated with lower outside ownership (i.e., greater ownership concentration).[32] In an unreported regression, I also confirm the finding of LLSV (1998) that ownership concentration is negatively and significantly associated with antidirector rights.[33] The coefficient on the antidirector rights index is positive and significant at the 1% level. Accounting standards is never significant beyond the 20% level and the coefficient is very small.[34]

Column 2 includes the insider trading law index (*ITL*) and the legal origin variables. The coefficient on the index of insider trading law is positive (.04) and significant at the 5% level.[35] Other things equal, this implies that an increase in the insider trading law score from the Scandinavian civil law average of 2.5 to the English common law average of 3.5 is associated with an increase of 4 percentage points in outside ownership (or about 7% of the civil law average outside ownership of .55). In column 3, the coefficient on *Sanction* is .09 and it is significant at the 1% level. The

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[32] The coefficients on the legal origin variables are relative to English common law origin, the omitted dummy variable.

[33] The coefficient on antidirector rights is of roughly the same order of magnitude as in LLSV (1997), despite the fact that the sample of countries in this article is slightly smaller than theirs.

[34] The regressions in Table 4 exclude the accounting standards variable, since the results are the same with or without it.

[35] The magnitude of this coefficient is comparable to that on the antidirector rights index when the latter is substituted for the insider trading law index.

coefficient *Enforced* is about .10 and it is significant at the 1% level (column 4). This implies that a switch from a regime in which insider trading law has not been enforced as of 1994 to one in which it has results in an impressive 10 percentage point rise in outside ownership, other things equal. In columns 5 and 6, I include the insider trading law measures (*ITL* and *Sanction*, respectively) together with enforcement. The results are roughly similar to those that result when I include each of the variables separately with legal origin. Columns 7 and 8 report regressions that include the two interaction terms, *ITL* times *Enforced* (i.e., *Effective Law*) and *Sanction* times *Enforced* (i.e., *Effective Sanction*), respectively. Both coefficients are positive and significant at the 1% level.

In column 9, I include each of the individual components of the insider trading law index separately. The results suggest that the possibility of criminal punishment is the main factor underlying the results for the aggregate index, *ITL*. The coefficient on *criminal* is .09 and it is significant at the 1% level. Enforcement remains positive and significant at the 5% level. A linear combination of the (insider trading law and enforcement) coefficients yields an estimate of .24 that is significant at the 1% level. This suggests that a simultaneous move from an insider trading law index (*ITL*) of 0 to a score of 5 and from no enforcement to enforcement results in a rise in outside ownership of 24 percentage points, other things equal.

Finally, when I include antidirector rights in regressions (unreported) along with the insider trading law variables, the coefficients on both the antidirector rights index and the insider trading law measures fall in magnitude, but remain significant. In all of these regressions, the coefficients on the insider trading law measures are larger than that on antidirector rights.

It is possible that insider trading legislation is endogenous to ownership concentration. For instance, insider trading laws might be more lax in countries in which ownership is more concentrated because, as I argue in Beny (2001), there might be fewer opportunities for profitable insider trading in firms with concentrated ownership. Alternatively, as I argue in Beny (2002), insiders might constitute a more formidable lobby against insider trading legislation and enforcement in economies dominated by corporate insiders (i.e., in economies in which ownership is highly concentrated). Another possibility is that, in countries in which corporate ownership is highly concentrated, the stock market is relatively unimportant to the real economy and thus the government makes little effort to control insider trading.[36] That is, ensuring price accuracy and liquidity are not major public concerns, since the stock market is of little significance to capital allocation and the real economy.

To address this concern, I use legal origin as an instrument for the insider trading law measures. LLSV (1998) argue that legal origin is exogenous to the financial system and demonstrate that ownership structure is correlated with legal origin. Table 5 reports the results of instrumental variables regressions of outside ownership on the insider trading law variables. In regressions 1, 2, 6 and 7, the p-values of Hausman specification tests indicate that the coefficients on the insider trading law variables are not significantly different from the corresponding OLS estimates reported in Table 4. However, the estimates in regressions 3-5 are significantly different from the corresponding OLS regressions. The coefficient on *Enforced* in columns 3-5 is about .32 and it is significant at the 1% level in each of these regressions. This means that, other things equal, an

[36] I am grateful to Merritt Fox for sharing this insight with me.

increase from the civil law median enforcement measure of 0 to the common law median enforcement measure of 1 is associated with a 30 percentage point increase in outside ownership, other things equal.

The results in Tables 4 are consistent with Hypothesis 1, which predicts that more stringent insider trading laws are associated with more outside ownership because they reduce the probability of expropriation by insiders. The most statistically important elements of the insider trading index in these regressions are the potential for criminal prosecution and the incidence of enforcement. When I address the potential endogeneity between ownership concentration and insider trading law in Table 5, the findings of Table 4 are largely unchanged.

B. Stock Price Informativeness and Insider Trading Law

Hypothesis 2 suggests that more firm-specific information is impounded into stock prices in markets with more stringent insider trading laws, other things equal.

Table 6 reports regressions in which the dependent variable is stock price synchronicity, the proportion of stocks moving in the same direction in an average week in 1995 (Morck, Yeung and Yu, 2000). In all of the regressions in Table 6, the coefficient on the log of GNP is negative and significant, consistent with Morck, Yeung and Yu (2000). Also consistent with Morck, Yeung and Yu (2000), stock prices are less synchronous (i.e., contain more firm-specific information) in economies with a higher antidirector rights score, controlling for legal origin.

In column 2, the coefficient on the antidirector rights index is negative (-1.05) and significant at the 15% level. In column 3, the coefficient on the insider trading law index, *ITL*, is negative (-1.45) and significant at the 5% level. This result suggests that an increase in the insider trading law index from Mexico's score of 1 to the U.S. score of 5,

for example, results in a 5.8 percentage point decrease in stock price synchronicity, other things equal. In column 4, the coefficient on *Sanction* is -2.39 and it is significant at the 5% level. Thus, an increase in the sanction score from the civil law mean of .87 to the common law mean of 1.15 is associated with about a .70 percentage point drop in synchronicity, other things equal. The coefficient on *Enforced* is insignificant in regressions 5-7. The interaction terms in columns 8 and 9 are also insignificant.

In column 10, I include each of the individual components of insider trading law separately. The tippee liability and the possibility of multiple damages components of the IT index appear to underlie the result for the aggregate index. The tippee variable is significant at the 10% level and damages is significant at the 20% level The remaining components are insignificant. A linear combination of the individual insider trading law and enforcement coefficients yields an estimate of –7.56 that is significant at the 5% level. This suggests that a simultaneous move from an insider trading law index (*ITL*) of 0 to a score of 5 and from no enforcement to enforcement is associated with a –7.56 point drop in the percentage of stock prices moving together, other things equal.

I run the same regressions as in Table 6 (columns 3-10) with the antidirector rights index. This does not qualitatively change the results, although it does slightly lower the coefficients on the insider trading law measures as well as on the antidirector rights index and, in a few instances, the antidirector rights measure becomes less significant.[37] I also run the regressions in Table 6 with the accounting standards measure. The coefficient on accounting standards is positive and significant in all regression

[37] A possible explanation is that the insider trading law measures and the antidirector rights index are highly correlated.

specifications. This result seems counterintuitive, since one would expect better disclosure to be associated with a greater degree of firm-specific information reflected in stock prices (i.e., less synchronous stock prices).[38] I do not report these regressions, since they do not qualitatively change the results.

The results in Table 6 are generally consistent with Hypothesis 2, which predicts that tougher insider trading laws are associated with more informative stock prices. This finding is consistent with the argument that a more level playing field between insiders and arbitrage traders leads to greater stock price accuracy (see, e.g., Georgakopoulos, 1993; Goshen and Parchomovsky, 2001). The most statistically important elements of the law in these regressions are tippee liability and the possibility of multiple damages, although the latter result is rather weak.

C. Stock Market Liquidity and Insider Trading Law

Hypothesis 3 predicts that countries with more stringent insider trading laws have more liquid equity markets, other things equal. In this section, I present the results of regressions of stock market turnover on the insider trading law variables and legal origin. The dependent variable is the log of the turnover ratio. Table 7 reports the results.

In columns 1-9, the coefficients on each of the civil law origins, French, German and Scandinavian, are positive and significant. In addition, the coefficient on the accounting standards variable is positive and significant in all of the regressions. This result is consistent with the notion that transparency is important for promoting liquid

[38] This rather counterintuitive result might be explained by the fact that the accounting standards index is a poor proxy for the legal disclosure regime.

markets (Pagano and Roell, 1996). The coefficient on the antidirector rights index is insignificant and, since there is no obvious theoretical reason why antidirector rights should directly affect liquidity, I do not report it in Table 7.

In column 2, the coefficient on the index of insider trading law is positive (0.19) and significant at the 15% level. This implies that a simultaneous move from a country with an aggregate insider trading law score (*ITL*) of 3 (e.g., Argentina) to a country with an aggregate score of 4 (e.g., Singapore) results in about a 20% increase in the turnover ratio. The coefficient on *Enforced* is never significant (columns 4-6). In column 6, the coefficient on *Sanction* is positive (.05) but it is only weakly significant at the 20% level. The coefficient on the interaction term *Effective Law* (*ITL* times *Enforced*) is insignificant in column 7. In column 8, the coefficient on the interaction term *Effective Sanction* (*Sanction* times *Enforced*) is positive but it is significant at only the 20% level.

Finally, in column 9, I include each of the individual components of the aggregate insider trading law variable (*ITL*) separately. The results in column 9 suggest that the most important component is the ban on tipping outsiders. The coefficient on *tipping* is positive (.93) and significant at the 10% level. A linear combination of the coefficients yields an estimate of 1.28 that is significant at the 10% level. This implies that moving from an insider trading index of 0 to a score of 5 and from no enforcement to enforcement is associated with more than a doubling of the turnover ratio.

When I run the same set of regressions without the accounting standards variable, the results are largely similar. The only significant differences are that the coefficient on the aggregate insider trading law index (*ITL*) becomes slightly larger and more significant

and the coefficient on *Effective Sanction* increases slightly in magnitude and becomes significant, whereas it is insignificant when it is included alongside accounting standards.

As a robustness check of the significance of insider trading law and enforcement to liquidity, I run random effects regressions on panel (cross-section and time series) data in which the independent variable is the log of the turnover ratio. The data used in these regressions come from Beny (2002) and are described in the notes accompanying Table 8. In these regressions, there are two insider trading law measures: a dummy variable that equals 1 if the country has an insider trading law (and 0 otherwise) and another dummy variable that equals 1 if the country has enforced the law at least once in the history of its stock market (and zero otherwise). The results, reported in Table 8, show that both the existence and enforcement of insider trading legislation are positively and significantly associated with stock market turnover. These results are consistent with those of Bhattacharya and Daouk (2002), and suggest that both insider trading legislation and enforcement are associated with more liquid stock markets.

It is possible that insider trading legislation and enforcement are endogenous to stock market liquidity. In Beny (2002), I argue that the (private and public) demand for insider trading legislation and enforcement rises as the stock market becomes more liquid. As a result, regressing liquidity on the insider trading law and enforcement measures could bias the results. Therefore, I run instrumental variables regressions of the log of the turnover ratio on insider trading law and enforcement, using the exogenous (LLSV, 1998) legal origin variables as instruments for insider trading law and enforcement. The results are presented in Table 9 and the data are described in the accompanying notes. In column 1, the coefficient on the insider trading law indicator is

an impressive 2.6 and it is significant at the 5% level. However, the coefficient on the enforcement indicator is insignificant in columns 2 and 3, consistent with the results in Table 7.

Overall, the results in Tables 7-9 are consistent with Hypothesis 3, which predicts that tougher insider trading laws are associated with more liquid stock markets. The single most statistically important element of the law is the prohibition against corporate insiders' tipping outsiders. Enforcement, inexplicably, is insignificant.

D. Summary and Discussion of Results

The empirical tests yield three general results. The first result is that large public corporations tend to have greater outside ownership (less concentrated ownership) in countries with tougher insider trading laws and enforcement, consistent with Hypothesis 1. Outside ownership is especially positively and significantly associated with the potential sanctions for violating the insider trading laws and with enforcement.[39] Since concentrated ownership is an important mechanism by which firms address agency problems, this result supports legal and economic theories that characterize insider trading an as agency cost.

The ownership results warrant further discussion, however. Demsetz (1986) and Bhide (1993) suggest that lax insider trading rules reduce rather than increase agency costs, since they encourage active shareholding. Large shareholders engage in valuable corporate monitoring if they have adequate incentives to bear the risk of concentrated

[39] It makes sense that the potential sanctions for violating the law are pivotal, since the deterrent effect of the law depends importantly on the potential punishment. Greater sanctions raise the cost of transgressing the insider trading ban.

shareholding (Demsetz, 1986; Bhide, 1993). Insider trading profits are one means by which large shareholders are compensated for valuable monitoring (Demsetz, 1986). This logic implies that my finding of a positive association between insider trading laws and enforcement and outside ownership might equally support the claim that insider trading laws exacerbate agency costs, by "impair[ing] governance by encouraging diffuse stockholding and discouraging active investing." (Bhide, 1993, p. 43; Demsetz, 1986). However, in Beny (2001), I present evidence that insider trading laws are positively associated with valuation even in firms in which ownership tends to be concentrated.

The second result is that stock prices tend to be less synchronous (i.e., contain more firm-specific information) in countries with more stringent insider trading laws, consistent with Hypothesis 2. This finding is also consistent with the claim of proponents of insider trading legislation that insider trading is detrimental to price accuracy because it both discourages arbitrage traders either by increasing the risk of expropriation or by stifling competition in the market for information and increases insiders' incentives to manipulate information disclosure. On the other hand, it contradicts the claim of opponents of insider trading legislation that insider trading is an effective and less costly alternative to traditional disclosure.

There is a potential omitted variable problem in the syncrhonicity regressions, however. In particular, countries with strong insider trading rules and enforcement regimes probably also tend to have more stringent disclosure regimes. As a result, the regressions might be capturing this effect, rather than the effect of insider trading rules

per se.[40] Unfortunately, I do not have a satisfactory empirical proxy for the quality of disclosure rules. The accounting standards measure is the best available proxy at the moment. Yet, as the synchronicity regressions show, it yields counterintuitive results.

The third result is that countries with tougher insider trading laws tend to have more liquid stock markets, consistent with Hypothesis 3. This finding is also consistent with theoretical and empirical research in market microstructure that demonstrates the detrimental effect of information asymmetry on trading costs and with the notion that insiders' informational monopoly harms liquidity (increases transaction costs) by reducing competition among informed traders. It therefore supports those who advocate insider trading regulation on the ground that it promotes liquid stock markets.

VI. CONCLUSION

The finding of a positive association between outside ownership and insider trading law and enforcement suggests that insider trading legislation might ameliorate the potential agency costs of insider trading. However, this conclusion is somewhat tenuous, since concentrated ownership could also mitigate agency costs, and insider trading profits might be the means to encourage active monitoring by large shareholders (Demsetz, 1986; Bhide, 1993). I provide more direct evidence on the agency implications of insider trading legislation in Beny (2001), where I empirically examine the relationship between insider trading legislation and corporate valuation at the firm level for both widely held firms and firms with a controlling owner.

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[40] For example, Durnev, Fox, Morck, and Yeung (2003) show empirically that mandatory disclosure increases share price accuracy.

Even if insider trading legislation does not directly alleviate corporate agency costs,[41] however, the empirical results of this article suggest that such legislation might generate positive market externalities. In particular, the finding that more stringent insider trading laws are associated with more liquid stock markets and more informative stock prices supports those who advocate insider trading legislation in the interest of promoting economic efficiency. More liquid markets and more accurate stock prices reduce the cost of equity capital and improve the efficiency of capital allocation, respectively (Amihud and Mendelson, 1986; Wurgler, 2000). Private parties are unlikely to give adequate consideration to these external benefits, thus strengthening the case for public regulation (Shleifer and Johnson, 1999; Goshen and Parchomovsky, 2001).

Furthermore, to the extent that insider trading legislation encourages more accurate stock prices and greater stock market liquidity, indirectly it might also ameliorate corporate agency problems. More accurate stock prices improve corporate governance.[42] So too does greater liquidity, particularly by facilitating the market for corporate control.[43] In contrast, less accurate prices and lower liquidity reduce

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41 However, the evidence presented in Beny (2001) suggests that insider trading legislation and enforcement *do* alleviate agency costs, particularly for firms in which ownership and control are separated. In that study, I find a positive and statistically significant association between corporate valuation and insider trading law and enforcement among firms that are widely held.

42 The rich literature on mandatory securities disclosure enumerates several economic benefits of accurate stock prices, including their role in improving corporate governance and reducing agency costs. See Fox (1999), for example.

43 Maug (1998) shows that liquid stock markets are beneficial because they improve corporate governance by improving large shareholders' incentives to monitor.

shareholders' incentives to monitor and hence increase corporate insiders' ability and incentives to expropriate outside investors (Fox, 1999; Maug, 1998).

Some of the findings of this article (e.g., the finding that stronger insider trading rules are positively associated with price accuracy) might be explained by the fact that stringent insider trading rules tend to coincide with strict disclosure rules. This article does not address disclosure rules directly. Future research should do so, however, particularly regarding the interaction between disclosure rules and insider trading laws. Such work should empirically assess the complementarity (or substitutability) of insider trading laws and disclosure rules. There is already an emerging theoretical literature highlighting the relationship between these two sets of market regulations.[44] In addition, lawmakers have long noted the connection between disclosure and insider trading rules. Indeed, an important pillar of U.S. insider trading legislation is the "disclose or abstain" rule, which requires that insiders either disclose material nonpublic information or refrain from trading on the basis of such information. I defer this issue to future research.

[44] Shin (1996) shows theoretically that some restriction of insider trading combined with minimal disclosure requirements is the optimal approach to regulating insider trading. Baiman and Verrechia (1996) show that greater voluntary disclosure redues the extent of insider trading in a firm's shares. Fried (1997) argues that a rule that would require insiders to disclose their identities and intentions to trade prior to trading would reduce considerably (and perhaps even eliminate) insider trading profits.

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Data Appendix

Log of Gross National Product (GNP)
Logarithm of Gross National Product in 1994. *Source*: World Bank, World Development Report (1996).

Growth of per capita Gross Domestic Product (GDP)
Average annual percentage growth rate of per capita GDP for the years 1970-1993. *Source*: World Bank, World Development Report (1995).

Stock market capitalization
Total value of the country's public equity market in 1995. *Source*: International Finance Corporation, Emerging Stock Markets Factbook (1996).

Outside ownership
One minus the average fraction "of common shares owned by the three largest shareholders in the ten largest non-financial domestic firms" in the country. *Source*: LLSV (1998). *Primary sources*: Moody's International, CIFAR, EXTEL, WorldScope, 20-F Forms, Price Waterhouse, and various country sources.

Stock price synchronicity
The fraction of stocks whose prices moved in the same direction in an average week in 1995. *Source*: Morck, Yeung, and Yu (2000).

Stock market turnover
The total value traded divided by stock market capitalization in 1995. *Source*: International Finance Corporation, Emerging Stock Markets Factbook (1996).

Legal origin
An indicator variable that signifies the legal origin of the country's Company Law or Commercial Code. The variable equals 1 if the legal origin is English common law; 2 if it is the French civil law; 3 if it is the German civil law; and 4 if the origin is the Scandinavian civil law. *Source*: LLSV (1998). *Primary source*: Flores and Reynolds (1989).

Accounting standards
The accounting standards index assigns a rating to companies' 1990 annual reports on the basis of their inclusion or exclusion of 90 items. The 90 items are divided into 7 categories (general information, income statements, balance sheets, funds flow statement, accounting standards, stock data and special items). For each country, the index is based on examination of a minimum of 3 companies. These companies come from a cross-section of various industries. Seventy percent are industrial companies, while the remaining thirty percent are financial companies. *Source*: LLSV (1998). *Primary source*: Center for International Financial Analysis, International Accounting and Auditing Trends.

Antidirector rights index
The antidirector rights index aggregates various shareholder rights. The index is created by adding 1 if: "(1) the country allows shareholders to mail their proxy vote; (2) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (3) cumulative voting is allowed; (4) an oppressed minorities mechanism is in place; or (5) when the minimum percentage of share capital that entitles are shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10% (sample median). The index ranges from 0 to 5." *Source*: LLSV (1997). *Primary sources*: Countries' company laws or commercial codes.

Insider trading law (*ITL*)
An index aggregating individual components of countries' insider trading laws. The index is constructed by adding 1 if: (1) tippees, like primary insiders, are prohibited from trading on material non-public information; (2) insiders are prohibited from tipping outsiders about material non-public information and/or encouraging them to trade on such information for personal gain; (3) monetary penalties are proportional to insiders' trading profits; (4) investors have a private right of action; or (5) violation of the insider trading law is a criminal offense. The index ranges from 0 to 5, with 0 representing the most lax insider trading regime and 5 representing the toughest insider trading regime. *Sources*: Gaillard (1992); Stamp and Welsh (1996).

Sanctions (*Sanction*)
Sanction is constructed by adding 1 if: (1) monetary penalties are proportional to insiders' trading profits; (2) violation of the insider trading law is a criminal offense; or (3) investors have a private right of action. The index equals 0 to 3, with 0 representing the most lenient potential legal sanctions and 3 representing the most stringent potential sanctions. *Sources*: Gaillard (1992); Stamp and Welsh (1996).

Enforcement of Insider Trading Law (*Enforced*)
An indicator variable that equals 1 if the country's insider trading law has been enforced for the first time (i.e., at least once) by the end of 1994. *Source*: Bhattacharya and Daouk (2000). *Primary Sources*: national stock markets and regulators.

Effective law (*Effective Law*)
Insider Trading Law (*ITL*) Index times Enforcement (*Enforced*)

Effective sanction (*Effective Sanction*)
Insider Trading Sanctions (*Sanction*) times Enforcement (*Enforced*)

Table 1

Insider Trading Laws and Enforcement

Country	*Year of Law*	*Tippee*	*Tipping*	*Damages*	*Criminal*	*Private Right*	*ITL*	*Sanction*	*First Enforced*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
Common Law									
Australia	1991	1	1	0	1	1	4	1	1996
Canada	1966	1	1	1	1	1	5	2	1976
Hong Kong	1991	1	1	1	0	0	3	1	1994
India	1992	0	1	0	1	0	2	1	1998
Ireland	1990	1	1	0	1	1	4	1	-
Israel	1981	0	1	0	1	1	3	1	1989
Malaysia	1973	0	1	0	1	1	3	1	1996
New Zealand	1988	1	1	1	0	1	4	1	-
Singapore	1973	1	1	0	1	1	4	1	1978
South Africa	1989	1	0	0	1	1	3	1	-
Thailand	1984	1	1	0	1	0	3	1	1993
UK	1980	1	1	0	1	0	3	1	1981
USA	1934	1	1	1	1	1	5	2	1961
Common Law Average	**1979**	**0.77**	**0.92**	**0.31**	**0.85**	**0.70**	**3.54**	**1.15**	**1986**
Common Law Median	**1984**	**1**	**1**	**0**	**1**	**1**	**3**	**1**	**1991**

Table 1

Insider Trading Laws and Enforcement (Continued)

Country	*Year of Law*	*Tippee*	*Tipping*	*Damages*	*Criminal*	*Private Right*	*ITL*	*Sanction*	*First Enforced*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
French Civil Law									
Argentina	1991	1	1	1	0	0	3	1	1995
Belgium	1990	1	1	0	1	0	3	1	1994
Brazil	1976	1	1	0	0	1	3	0	1978
France	1967	1	1	1	1	0	4	2	1975
Greece	1988	1	1	0	0	0	2	0	1996
Indonesia	1991	0	1	0	1	0	2	1	1996
Italy	1991	1	1	0	1	0	3	1	1996
Mexico	1975	0	1	0	0	0	1	0	-
Netherlands	1989	1	1	0	1	0	3	1	1994
Philippines	1982	1	0	0	1	0	2	1	-
Portugal	1986	1	1	0	1	1	4	1	-
Spain	1994	1	1	1	0	1	4	1	1998
French Civil Law Average	**1985**	**0.83**	**0.92**	**0.25**	**0.58**	**0.25**	**2.83**	**0.83**	**1991**
French Civil Law Median	**1988**	**1**	**1**	**0**	**1**	**0**	**3**	**1**	**1995**

Table 1

Insider Trading Laws and Enforcement (Continued)

Country	*Year of Law*	*Tippee*	*Tipping*	*Damages*	*Criminal*	*Private Right*	*ITL*	*Sanction*	*First Enforced*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
German Civil Law									
Austria	1993	1	1	0	0	0	2	0	-
Germany	1994	1	1	0	1	0	3	1	1995
Japan	1988	1	0	0	1	0	2	1	1990
Luxembourg	1991	1	1	0	1	0	3	1	-
South Korea	1976	1	1	1	1	1	5	2	1988
Switzerland	1988	1	1	0	1	0	3	1	1995
Taiwan	1988	1	1	0	1	1	4	1	1989
German Civil Law Average	**1988**	**1**	**0.86**	**0.14**	**0.86**	**0.29**	**3.14**	**0.58**	**1991**
German Civil Law Median	**1988**	**1**	**1**	**0**	**1**	**0**	**3**	**1**	**1990**

Table 1

Insider Trading Laws and Enforcement (Continued)

Country	*Year of Law*	*Tippee*	*Tipping*	*Damages*	*Criminal*	*Private Right*	*ITL*	*Sanction*	*First Enforced*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
Scandinavian Civil Law									
Denmark	1991	1	1	0	1	0	3	1	1996
Finland	1989	1	1	0	1	0	3	1	1993
Norway	1985	1	0	0	0	0	1	0	1990
Sweden	1971	1	1	0	1	0	3	1	1990
Scandinavian Civil Law Average	**1984**	**1**	**0.75**	**0**	**0.75**	**0**	**2.50**	**0.75**	**1992**
Scandinavian Civil Law Median	**1987**	**1**	**1**	**0**	**1**	**0**	**3**	**1**	**1991**

Table 1

Insider Trading Laws and Enforcement (Continued)

Country	*Year of Law*	*Tippee*	*Tipping*	*Damages*	*Criminal*	*Private Right*	*ITL*	*Sanction*	*First Enforced*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
Civil Law Average	1986	0.91	0.87	0.17	0.70	0.22	2.87	0.87	1991
Civil Law Median	1988	1	1	0	1	0	3	1	1994
Overall Average	1983	0.86	0.89	0.22	0.75	0.39	3.11	0.97	1989
Overall Median	1988	1	1	0	1	0	3	1	1993
t-test of means (Common vs. Civil Law)	-1.65[d]	-1.19	0.48	0.91	0.99	3.09[a]	2.05[b]	1.66[c]	-1.57[d]
z-test of medians (Common Law vs. Civil Law)	-1.23	-1.18	0.48	0.91	0.99	2.77[a]	1.93[b]	1.63[c]	-0.87

Notes: "Year of Law" is the year in which the country passed an insider trading law. *Tippee* equals one if tippees are prohibited from trading on material non-public information, and zero otherwise. *Tipping* equals one if insiders are prohibited from tipping outsiders about material non-public information, and zero otherwise. *Criminal* equals one if insider trading is a criminal offense, and zero otherwise. *Private right* equals one if investors have a private right of action against insiders who violate the insider trading laws, and zero otherwise. *Damages* equals one if potential damages are a multiple of the alleged insider trading profits, and zero otherwise. *ITL*, the aggregate insider trading law index, is the sum of columns 3 – 7 (*tippee*, *tipping*, *criminal*, *private right*, and *damages*). *Sanction* is the sum of columns 5 and 6 (*criminal* and *damages*). "First Enforcement" is the year in which the country first enforced its insider trading laws. All variables are described in detail in the Data Appendix.

Table 2

Summary Statistics

Panel A

Variable	Mean	Standard Deviation	Median	Minimum	Maximum	Observations
All Countries						
Log of GNP	12.38	1.25	12.29	10.44	15.67	35
GDP Growth	3.82	2.49	3.06	0.30	11.56	35
Log of Stock Market Capitalization	11.93	1.42	11.91	9.67	15.74	33
Outside Ownership	0.56	0.14	0.52	0.33	0.82	35
Turnover	55.94	45.44	43.20	0.70	211.40	37
Stock Price Synchronicity	66.20	4.28	66.60	57.90	76.30	32
Accounting Standards	65.24	9.75	65.00	36.00	83.00	33
Antidirector Rights	2.57	1.27	3.00	0.00	5.00	35
Common Law Countries						
Log of GNP	12.11	1.46	11.68	10.69	15.67	13
GDP Growth	4.42	2.27	4.25	1.67	7.70	13
Log of Stock Market Capitalization	12.57	1.42	12.41	10.16	15.74	11
Outside Ownership	0.58	0.12	0.53	0.46	0.81	11
Turnover	41.92	22.78	41.40	6.50	85.7	13
Stock Price Synchronicity	65.67	5.01	66.45	57.90	75.40	12
Accounting Standards	70.50	6.36	70.50	57	78	12
Antidirector Rights	3.54	0.78	4.00	2.00	5.00	13
Civil Law Countries						
Log of GNP	12.53	1.12	12.37	10.44	15.18	22
GDP Growth	3.46	2.60	2.67	0.30	11.56	22
Log of Stock Market Capitalization	11.76	1.31	11.73	9.74	15.11	20
Outside Ownership	0.55	0.15	0.51	0.33	0.82	22
Turnover	61.26	52.78	45.20	0.70	211.40	23
Stock Price Synchronicity	66.52	3.88	66.60	59.20	76.30	20
Accounting Standards	62.24	10.19	62.00	36.00	83.00	21
Antidirector Rights	2.00	1.15	2.00	0.00	4.00	22

Note: All variables are described in detail in the Data Appendix.

Table 2

Summary Statistics (Continued)

Panel B: Tests of Means and Medians

Variable	t-test of means (common vs. civil law)	z-test of medians (common vs. civil law)
Log of GNP	-0.97	-1.37
GDP Growth	1.10	1.52[d]
Log of Stock Market Capitalization	1.60[d]	1.57[d]
Outside Ownership	0.76	0.94
Turnover	-0.125	-0.74
Stock Price Synchronicity	-0.54	-0.35
Accounting Standards	2.53[b]	2.66[a]
Antidirector Rights	4.26[a]	3.63[a]

Note: All variables are described in detail in the Data Appendix.

Table 3

Simple Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of GNP (1)	1.00											
GDP Growth (2)	-0.12	1.00										
	(0.50)											
Stock Market Capitalization (3)	0.68[a]	-0.08	1.00									
	(0.00)	(0.69)										
Outside Ownership (4)	0.47[a]	0.19	0.54[a]	1.00								
	(0.00)	(0.27)	(0.00)									
Turnover (5)	0.45[a]	0.17	0.14	0.42[a]	1.00							
	(0.01)	(0.34)	(0.46)	(0.01)								
Stock Price Synchronicity (6)	-0.46[a]	0.50[a]	-0.39[b]	-0.18	-0.14	1.00						
	(0.01)	(0.00)	(0.04)	(0.31)	(0.45)							
Accounting Standards (7)	0.04	-0.00	0.15	0.45[a]	0.13	0.03	1.00					
	(0.82)	(1.00)	(0.43)	(0.01)	(0.46)	(0.87)						
Antidirector Rights (8)	-0.09	0.12	0.40[b]	0.36[b]	-0.13	-0.22	0.29[d]	1.00				
	(0.62)	(0.48)	(0.03)	(0.04)	(0.46)	(0.23)	(0.11)					
Civil Law Origin (9)	0.17	-0.19	-0.21	-0.13	0.21	0.10	-0.41[b]	-0.60[a]	1.00			
	(0.34)	(0.28)	(0.27)	(0.45)	(0.22)	(0.59)	(0.02)	(0.00)				
Insider Trading Law (10)	0.20	0.17	0.26	0.41[a]	0.27[d]	-0.36[b]	0.04	0.34[b]	-0.33[b]	1.00		
	(0.24)	(0.33)	(0.17)	(0.02)	(0.11)	(0.04)	(0.82)	(0.04)	(0.05)			
Sanction (11)	0.34[b]	0.15	0.37[b]	0.51[a]	0.23	-0.37[b]	0.27[d]	0.30[c]	-0.27[d]	0.76[a]	1.00	
	(0.05)	(0.41)	(0.04)	(0.00)	(0.18)	(0.04)	(0.13)	(0.08)	(0.11)	(0.00)		
Enforcement (12)	0.30[c]	0.20	0.29[d]	0.59[a]	0.23	-0.17	0.46[a]	0.26[d]	-0.17	0.29[c]	0.28[c]	1.00
	(0.08)	(0.26)	(0.12)	(0.00)	(0.18)	(0.35)	(0.01)	(0.13)	(0.31)	(0.09)	(0.10)	

Notes: Column 1 is Log of GNP; column 2 is GDP growth; column 3 is stock market capitalization; column 4 is outside ownership; column 5 is turnover; column 6 is stock price synchronicity; column 7 is accounting standards; column 8 is antidirector rights; column 9 is civil law origin; column 10 is insider trading law; column 11 is sanction; and column 12 is enforcement. All variables are described in detail in the Data Appendix. The numbers in parentheses are the probability levels (p-values) at which the null hypothesis of zero correlation can be rejected in two-tailed tests. The superscripts a, b, c, and d denote statistical significance at the 1%, 5%, 10% and 15% levels, respectively.

Table 4

OLS Regressions

Outside Ownership and Insider Trading Law

	Dependent Variable: Outside Ownership								
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log of GNP	0.055[a]	0.048[a]	0.041[a]	0.039[a]	0.036[b]	0.028[b]	0.037[b]	0.033[b]	0.034[b]
	(0.014)	(0.015)	(0.015)	(0.014)	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)
French Civil Law	-0.139[a]	-0.107[a]	-0.104[a]	-0.106[a]	-0.086[b]	-0.080[b]	-0.106[a]	-0.096[a]	-0.069[d]
	(0.033)	(0.036)	(0.034)	(0.036)	(0.039)	(0.035)	(0.036)	(0.035)	(0.043)
German Civil Law	0.012	0.035	0.042	0.041	0.055	0.064	0.045	0.045	0.056
	(0.074)	(0.065)	(0.064)	(0.058)	(0.054)	(0.052)	(0.056)	(0.059)	(0.060)
Scandinavian Civil Law	0.068[c]	0.108[b]	0.100[b]	0.050[d]	0.083	0.080[b]	0.078[b]	0.083[b]	0.086[c]
	(0.036)	(0.047)	(0.047)	(0.032)	(0.039)	(0.039)	(0.032)	(0.035)	(0.050)
ITL		0.041[b]			0.032[b]				
		(0.017)			(0.015)				
Sanction			0.091[a]			0.079[a]			
			(0.028)			(0.024)			
Enforced				0.098[a]	0.084[b]	0.086[b]			0.078[b]
				(0.037)	(0.035)	(0.034)			(0.037)
Effective Law							0.028[a]		
							(0.009)		
Effective Sanction								0.080[a]	
								(0.024)	
Tippee									0.021
									(0.043)
Tipping									-0.039
									(0.032)
Private									0.032
									(0.036)
Criminal									0.093[a]
									(0.026)
Damages									0.051
									(0.041)

Table 4

OLS Outside Ownership (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	-0.083	-0.137	-0.013	0.049	-0.012	0.095	0.070	0.125	0.032
	(0.166)	(0.161)	(0.158)	(0.169)	(0.159)	(0.159)	(0.172)	(0.172)	(0.165)
Observations	35	35	35	35	35	35	35	35	35
R^2	0.537	0.609	0.628	0.639	0.680	0.706	0.647	0.655	0.735
Linear Combination	-	-	-	-	0.116[a]	0.166[a]	-	-	0.237[a]
					(0.037)	(0.039)			(0.071)

Notes: The dependent variable is outside ownership, calculated as the fraction of shares owned by all shareholders except the three largest shareholders in the ten largest non-financial domestic firms, from LLSV (1998). The independent variables are the log of GNP; a dummy variable signifying legal origin, French, German or Scandinavian (the omitted dummy is English common law), from LLSV (1998); the insider trading law index (*ITL*); potential insider trading sanctions (*Sanction*); an enforcement dummy variable, *Enforced*, that equals one if the law has been enforced for the first time by 1994 and zero otherwise, from Bhattacharya and Daouk (2000); an interaction term, *Effective Law* (*ITL* times *Enforced*); another interactive term *Effective Sanction* (*Sanction* times *Enforced*); and each of the individual components of *ITL* (*tippee*, *tipping*, *private*, *criminal* and *damages*). All variables are described in detail in the Data Appendix. Robust standard errors are reported in parentheses. The superscripts a, b, c, and d denote statistical significance at the 1%, 5%, 10% and 15% levels, respectively.

Table 5

Instrumental Variables

Outside Ownership and Insider Trading Law

Dependent Variable: Outside Ownership							
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log of GNP	0.041[b]	0.025[a]	0.012	0.011	0.013	0.005	-0.006
	(0.018)	(0.021)	(0.024)	(0.026)	(0.033)	(0.034)	(0.032)
ITL	0.067			0.007			
	(0.052)			(0.065)			
Sanction		0.192[c]			-0.014		
		(0.114)			0.171		
Enforced			0.326[a]	0.320[a]	0.334[a]		
			(0.112)	(0.106)	(0.128)		
Effective Law						0.087[c]	
						(0.044)	
Effective Sanction							0.139[c]
							(0.070)
Constant	-0.151	0.066	0.249	0.235	0.246	0.345	0.237[b]
	(0.224)	(0.201)	(0.263)	(0.228)	(0.292)	(0.363)	(0.102)
Observations	35	35	35	35	35	35	35
R^2	0.301	0.263	.	.	.	.	0.044
Hausman Specification Test							
P > Chi^2	0.999[*]	0.983[*]	0.116[d]	0.038[b]	0.003[a]	0.163[*]	0.920[*]

Notes: The dependent variable is outside ownership, calculated as the fraction of shares owned by all shareholders except the three largest shareholders in the ten largest non-financial domestic firms, from LLSV (1998). The independent variables are the log of GNP; the insider trading law index (*ITL*); potential insider trading sanctions (*Sanction*); an enforcement dummy variable, *Enforced*, that equals one if the law has been enforced for the first time by 1994 and zero otherwise, from Bhattacharya and Daouk (2000); an interaction term, *Effective Law* (*ITL* times *Enforced*); and another interactive term *Effective Sanction* (*Sanction* times *Enforced*). Legal origins (English common law, French civil law, German civil law, and Scandinavian civil law) are instruments for all of the insider trading law variables. All variables are described in detail in the Data Appendix. Robust standard errors are reported in parentheses. The superscripts a, b, c, and d denote statistical significance at the 1%, 5%, 10% and 15% levels, respectively. * Signifies that the coefficient is not significantly different from OLS.

Table 6

OLS Regressions – Synchronicity of Stock Prices and Insider Trading Law

Dependent Variable: Synchronicity of Stock Prices										
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of GNP	-1.605[a]	-1.587[a]	-1.309[a]	-1.164[b]	-1.501[a]	1.343[b]	-1.125[c]	-1.375[b]	-1.234[b]	-1.472[b]
	(0.433)	(0.486)	(0.387)	(0.522)	(0.526)	(0.512)	(0.595)	(0.551)	(0.528)	(0.654)
GDP Growth	0.712[a]	0.720[b]	0.790[a]	0.815[a]	0.743[b]	0.780[b]	0.827[b]	0.777[b]	0.789[a]	0.536[d]
	(0.235)	(0.280)	(0.297)	(0.279)	(0.293)	(0.333)	(0.319)	(0.310)	(0.288)	(0.350)
French Civil Law	1.657	-0.396	0.578	0.856	2.960[c]	0.600	0.822	1.366	1.212	1.024
	(1.588)	(2.164)	(1.477)	(1.481)	(1.743)	(1.459)	(1.488)	(1.525)	(1.526)	(1.520)
German Civil Law	3.126[c]	1.628	2.087	2.031	1.507	2.132	1.974	2.729[d]	2.617[c]	3.685[c]
	(1.582)	(2.264)	(1.740)	(1.834)	(1.914)	(1.819)	(1.940)	(1.706)	(1.652)	(1.865)
Scandinavian Civil Law	1.319	0.196	0.012	-0.696	1.507	-0.074	0.781	1.384	1.316	0.747
	(1.613)	(1.646)	(1.872)	(1.812)	(1.914)	(2.037)	(1.995)	(1.846)	(1.872)	(1.821)
Antidirector Rights		-1.058[d]								
		(0.670)								
ITL			-1.453[b]			-1.473[b]				
			(0.599)			(0.608)				
Sanction				-2.389[b]			-2.364[c]			
				(1.173)			(1.194)			
Enforced					-0.530	0.192	-0.220			1.399
					(1.528)	(1.471)	(1.488)			(1.813)
Effective Law								-0.301		
								(0.435)		
Effective Sanction									-1.182	
									(1.003)	
Tippee										-4.843[c]
										(2.456)
Tipping										-0.556
										(1.442)
Private Criminal Damages										-1.586
										(1.385)
										-2.095
										(1.535)
Constant	82.082[a]	85.618[a]	83.333[a]	79.033[a]	80.987[a]	83.747[a]	78.608[a]	79.662[a]	78.105[a]	86.902[a]
	(5.790)	(6.409)	(5.255)	(6.577)	(6.848)	(6.790)	(7.474)	(7.248)	(6.974)	(9.657)
Observations	32	32	32	32	32	32	32	32	32	32
R^2	0.479	0.533	0.578	0.546	0.482	0.578	0.546	0.492	0.505	0.645
Linear Combination						-1.281	-2.585			-7.563[b]
	-	-	-	-	-	(1.539)	(1.733)	-	-	(2.849)

Table 6

OLS Regressions – Synchronicity of Stock Prices (Continued)

Notes: The dependent variable is stock price synchronicity, calculated as the proportion of stock prices that moved in the same direction in an average week in 1995, from Morck, Yeung, and Yu (2000). The independent variables are the log of GNP; the growth rate of GDP; a dummy variable signifying legal origin, French, German or Scandinavian (the omitted dummy is English common law), from LLSV (1998); an antidirector rights score, from LLSV (1998); the insider trading law index (*ITL*); potential insider trading sanctions (*Sanction*); an enforcement dummy variable, *Enforced*, that equals one if the law has been enforced for the first time by 1994 and zero otherwise, from Bhattacharya and Daouk (2000); an interaction term, *Effective law* (*ITL* times *Enforced*); another interactive term, *Effective Sanction* (*Sanction* times *Enforced*); and each of the individual components of *ITL* (*tippee*, *tipping*, *private*, *criminal* and *damages*). All variables are described in detail in the Data Appendix. Robust standard errors are reported in parentheses. The superscripts a, b, c, and d denote statistical significance at the 1%, 5%, 10% and 15% levels, respectively.

Table 7

OLS Regressions – Stock Market Turnover

Dependent Variable: Log of Stock Market Turnover Ratio									
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log of GNP	0.182[c]	0.141	0.172[d]	0.141	0.114	0.134	0.130	0.117	0.122
	(0.102)	(0.100)	(0.112)	(0.098)	(0.098)	(0.109)	(0.109)	(0.110)	(0.106)
GDP Growth	0.022	0.009	0.020	0.001	-0.007	-0.000	0.001	0.001	0.014
	(0.042)	(0.043)	(0.044)	(0.052)	(0.052)	(0.053)	(0.048)	(0.049)	(0.040)
Accounting Standards	0.033[b]	0.031[a]	0.032[b]	0.027[c]	0.026[b]	0.026[c]	0.028[c]	0.026[b]	0.035[b]
	(0.014)	(0.011)	(0.014)	(0.014)	(0.012)	(0.014)	(0.015)	(0.012)	(0.014)
French Civil Law	0.478[d]	0.551[c]	0.491[d]	0.457[d]	0.528[c]	0.466[d]	0.483[d]	0.483[d]	0.507[d]
	(0.317)	(0.308)	(0.332)	(0.292)	(0.291)	(0.309)	(0.293)	(0.288)	(0.332)
German Civil Law	1.109[a]	1.209[a]	1.126[a]	1.167[a]	1.244[a]	1.179[a]	1.200[a]	1.178[a]	1.226[a]
	(0.343)	(0.302)	(0.337)	(0.375)	(0.324)	(0.365)	(0.337)	(0.347)	(0.292)
Scandinavian Civil Law	0.450[b]	0.603[b]	0.471[b]	0.388[c]	0.542[b]	0.404[c]	0.467[b]	0.489[b]	0.467
	(0.186)	(0.245)	(0.203)	(0.193)	(0.245)	(0.211)	(0.218)	(0.226)	(0.352)
ITL		0.191[d]			0.174				
		(0.115)			(0.125)				
Sanction			0.063			0.046			
			(0.178)			(0.173)			
Enforced				0.284	0.215	0.280			0.170
				(0.303)	(0.317)	(0.310)			(0.282)
Effective Law							0.086		
							(0.075)		
Effective Sanction								0.253	
								(0.130)	
Tippee									0.302
									(0.250)
Tipping									0.933[c]
									(0.457)
Private									0.052
									(0.189)
Criminal									-0.093
									(0.252)
Damages									-0.083
									(0.258)

Table 7

OLS Regressions –Turnover (Co ntinued)

Constant	-1.133	-1.111	-1.027	-0.295	-0.477	-0.251	-0.290	0.044	-1.649
	(1.487)	(1.303)	(1.537)	(1.346)	(1.263)	(1.351)	(1.642)	(1.480)	(1.541)
Observations	33	33	33	33	33	33	33	33	33
R^2	0.494	0.544	0.496	0.516	0.556	0.517	0.524	0.526	0.670
Linear Combination					0.389	0.326			1.280[c]
	-	-	-	-	(0.299)	(0.340)	-	-	(0.634)

Notes: The dependent variable is the log of the turnover ratio, calculated as the ratio of total value traded to stock market value, from International Finance Corporation (1996). The independent variables are the log of GNP; the rate of growth of GDP; an index of accounting standards, a proxy for the quality of disclosure from LLSV (1998); a dummy variable signifying legal origin, French, German or Scandinavian (the omitted dummy is English common law), from LLSV (1998); the insider trading law index (*ITL*); potential insider trading sanctions (*Sanction*); an enforcement dummy variable, *Enforced*, that equals one if the law has been enforced for the first time by 1994 and zero otherwise, from Bhattacharya and Daouk (2000); an interaction term, *Effective Law* (*ITL* times *Enforced*); another interactive term *Effective Sanction* (*Sanction* times *Enforced*); and each of the individual components of *ITL* (*tippee, tipping, private, criminal* and *damages*). All variables are described in detail in the Data Appendix. Robust standard errors are reported in parentheses. The superscripts a, b, c, and d denote statistical significance at the 1%, 5%, 10% and 15% levels, respectively.

Table 8

Random Effects Regression

Ex Post Liquidity

Dependent variable: *Log of Turnover Ratio*				
Independent Variable	(1)	(2)	(3)	(4)
Log of GDP	0.745[a]	0.562[a]	0.654[a]	0.546[a]
	(0.073)	(0.073)	(0.071)	(0.070)
French Civil Law	-0.188	-0.080	-0.183	-0.082
	(0.301)	(0.291)	(0.278)	(0.273)
German Civil Law	-0.617	-0.197	-0.543	-0.190
	(0.465)	(0.451)	(0.430)	(0.424)
Scandinavian Civil Law	-0.214	-0.098	-0.209	-0.097
	(0.555)	(0.536)	(0.513)	(0.503)
Insider Trading Law Exists		0.669[a]		0.656[a]
		(0.068)		(0.072)
Insider Trading Law Enforced			0.390[a]	0.067
			(0.110)	(0.110)
Constant	-20.183[a]	-16.161[a]	-18.000[a]	-15.778[a]
	(1.784)	(1.768)	(1.721)	(1.701)
Observations	662	662	662	662
R^2	0.345	0.388	0.368	0.391
Hausman Specification Test: P > Chi^2	0.000[a]	0.010[a]	0.000[a]	0.000[a]

Notes: The dependent variable is the log of the annual turnover ratio (total value traded divided by stock market capitalization) measured over the period 1980-1997, from Beck, Demirguc-Kunt, and Levine (1999). The independent variables include the log of annual GDP over the period 1980-1997 from World Bank (1999); legal origin dummies: French, German and Scandinavian civil law (the omitted dummy is English common law); an indicator variable, "insider trading law exists" that equals one if the country has insider trading laws, and zero otherwise, from Bhattacharya and Daouk (2000); and an indicator variable, "insider trading law enforced" that equals one if the country has enforced its insider trading laws at least once, and zero otherwise, from Bhattacharya and Daouk (2000). Robust standard errors are reported in parentheses. The superscripts a, b, c, and d denote statistical significance at the 1%, 5%, 10% and 15% levels, respectively.

Table 9

Instrumental Variables Regression

Ex Post Liquidity

Dependent variable: *Log of Turnover Ratio*			
Independent Variable	(1)	(2)	(3)
Log of GDP	0.414[a]	0.473[a]	0.487[a]
	(0.046)	(0.061)	(0.079)
Insider Trading Law Exists	2.599[b]		3.165[b]
	(1.104)		(1.472)
Insider Trading Law Enforced		-0.014	-1.563
		(1.011)	(1.444)
Constant	-13.593[a]	-13.762[a]	-15.519[a]
	(1.016)	(1.414)	(2.110)
Observations	662	662	662
R^2	.	0.333	.
Hausman Specification Test: P > Chi^2	0.062[c]	0.148[d]	0.001[a]

Notes: The dependent variable is the log of the annual turnover ratio (total value traded divided by stock market capitalization) measured over the period 1980-1997, from Beck, Demirguc-Kunt, and Levine (1999). The independent variables include the log of annual GDP over the period 1980-1997 from World Bank (1999); an indicator variable, "Insider Trading Law Exists" that equals one if the country has insider trading laws, and zero otherwise, from Bhattacharya and Daouk (2000); and an indicator variable, "Insider Trading Law Enforced" that equals one if the country has enforced its insider trading laws at least once, and zero otherwise, from Bhattacharya and Daouk (2000). Legal origins (English common law, French civil law, German civil law, and Scandinavian civil law) are instruments for all of the insider trading law variables. Robust standard errors are reported in parentheses. The superscripts a, b, c, and d denote statistical significance at the 1%, 5%, 10% and 15% levels, respectively.