NORTH-HOLLAND

The Journal of Socio-Economics

Journal of Socio-Economics 29 (2000) 189–201

Corporate fraud, systematic risk, and shareholder enrichment

Dale O. Cloninger*, Edward R. Waller

School of Business and Public Administration, University of Houston–Clear Lake, 2700 Bay Area Blvd., Houston, TX 77058, USA

Abstract

The impact of the disclosure of alleged illegal corporate activities together with the possible motives for their use increasingly has become the subject of research by financial scholars. These studies primarily analyze the disclosure's effect on the market returns of the firm's equity. The consensus of these studies is that the initial disclosure of alleged illegal corporate activities results in significant negative abnormal returns to the existing shareholders. The size of these abnormal returns generally exceeds the actual fines, fees and penalties that the firms eventually experience. The impact of these disclosures on systematic risk and their possible implications for managerial behavior and corporate policy have suffered from relative neglect. The present research seeks to establish what, if any, impact the disclosure of alleged corporate fraud has on systematic risk. Using the data set provided by Karpoff and Lott (1993, The reputational penalty firms bear from committing corporate fraud. *J Law Econ*, 34, 757–802), this research tests whether securities experience any significant beta shifts upon the initial disclosure of alleged corporate fraud. Empirical tests find evidence consistent with the theory that agents engage in illegal activity in an attempt to enhance share price. The empirical results also provide additional insight into the question of why corporations engage in criminal activity. © 2000 Elsevier Science Inc. All rights reserved.

1. Introduction

The impact of the disclosure of alleged illegal corporate activities together with the possible motives for their use has increasingly become the subject of research by financial

* Corresponding author. Tel.: +1-281-283-3210.
E-mail address: cloninger@cl.uh.edu (D.O. Cloninger).

1053-5357/00/$ – see front matter © 2000 Elsevier Science Inc. All rights reserved.
PII: S1053-5357(00)00061-5

scholars. These studies primarily analyze the disclosure's effect on the market returns of the firm's equity. The consensus of these studies is that the initial disclosure of alleged illegal corporate activities results in significant negative abnormal returns to the existing shareholders. The size of these abnormal returns generally exceeds the actual fines, fees and penalties that the firms eventually experience. The impact of these disclosures on systematic risk and their possible implications for managerial behavior and corporate policy have suffered from relative neglect. The present research seeks to establish what, if any, impact the disclosure of alleged corporate fraud has on systematic risk. These results together with existing research provide useful implications for corporate policy.

2. Previous research on illegal corporate behavior

Cloninger (1981, 1990) tied the supply of criminal offenses function developed by Becker (1968) and subsequently tested by Ehrlich (1973) to the abandonment model of Robichek and Van Horne (1967). Cloninger developed a model that treats the supply of arson as a function of risk, return and opportunity costs. Previous research on arson sought to identify correlates of arson without attempting to specify any model. Empirical tests validate Cloninger's model both in the original sample and in the 1990 update incorporating Tobin's Q. Subsequently, Cloninger (1982) formulated the generalized hypothesis that agents may resort to illegal or unethical activity as additional means of enhancing share price. Even though efforts by agents to reduce risk by unethical means affects total risk, Cloninger has shown how these same efforts can specifically influence systematic risk. Thus, the rise in systematic risk upon the disclosure of alleged corporate criminal behavior may be interpreted as evidence of agents' desire to enhance share price.

Strahan, Smith, and Beedles (1983), using standard event study methodology, reported empirical results consistent with the share price enhancement motive, although they made no effort to attribute any motive to the illegal behavior. They found the presence of excess negative returns upon the first disclosure of alleged illegal corporate activity. Cloninger (1985a) further developed the theoretical basis for the use of illegal or unethical activities as a means of enhancing share price. Empirical support for this position is provided in Cloninger (1985b) through the case study of Hitachi's alleged corporate espionage against IBM. He found that upon the disclosure of the alleged theft of corporate secrets from IBM, Hitachi's stock price suffered significant declines while IBM's stock price experienced significant gains.

Lean, Ogur, and Rodgers (1985) found evidence that the disclosure of illegal activities by corporations adversely affects their profitability as measured by accounting returns. Cloninger, Skantz, and Strickland (1987) and Skantz, Cloninger, and Strickland (1990) provided further empirical support for the presence of excess negative (market) returns upon the disclosure of alleged price fixing. However, Oppenheimer and Stanley (1989) found only short-lived adverse affects on stockholder returns.

More recently, Karpoff and Lott (1993), in perhaps the most comprehensive study to date, examined the impact of corporate fraud on market returns of firms accused of fraudulent activity. Their research indicates that market returns suffer significant negative abnormal

returns upon the disclosure of alleged corporate fraud. The resultant decreases in share prices average six times the ultimate fines, penalties and legal fees associated with the illegal activities. Karpoff and Lott concluded that the affected firms suffer significant decreases in reputational capital. The authors did not attempt to measure the possible impact upon systematic risk or impute any motive for the fraudulent behavior.

Cloninger (1982, 1995) suggests that firms through their agents may use illegal activity as another means or enhancing share price by either increasing the returns or reducing the risk of the firm's assets. Thus, illegal activity is one way in which agents may attempt to "hedge" legal activities. Criminal activities like fraud, if successful, can reduce the risk or enhance the returns of otherwise legal activity while incurring what is perceived as minimal risk of detection. This hedging hypothesis suggests that agents engage in certain illegal activities as a means of enhancing the firm's returns or smoothing its cash flows thereby reducing variability. Cloninger (1982) argues that less variability in the firm's cash flows should translate into a lower market beta. In either case, successful attempts to hedge otherwise legitimate returns or cash flows by illegal or unethical means will result in enhanced share value

Higher post event betas, vis-à-vis pre-event betas, could serve as evidence that the firm's market risk has increased as a result of the disclosure of alleged fraudulent activities—an outcome consistent with the hedging hypothesis, that is, the shareholder enrichment motive. Of course, lower post event returns could also be consistent with the hedging hypothesis. This paper limits its analysis to the effect of alleged fraudulent activity on the variability of returns. Karpoff and Lott provide a detailed analysis of the effect of these activities on market returns.

Lower post event betas could serve as evidence that the market anticipates lower risk associated with the cessation of the firm's illegal activities. Reichert, Lockett, and Rao (1996) argue that the latter result serves as evidence that agents employ fraudulent activities that the market perceives as "speculative" and destabilizing to the firm's returns. If so, disclosure and anticipated subsequent cessation of the fraudulent activities should cause the firm's beta to fall. However, the authors fail to explain why agents would knowingly engage in activities that would destabilize the stock's returns. Such action would be rational only if the agents expect the illegal activities to increase returns sufficiently to enhance the firm's value at the expense of higher risk, or if the agents expect to expropriate any anticipated gains from the activities. If the agent's motive were to expropriate any anticipated gains for themselves the speculative hypothesis would not be at work. Significant abnormal returns in excess of the fees, fines and penalties upon the disclosure of these activities suggest that the agents do not extract a significant portion of any possible gains.

Additionally, Reichert, Lockett, and Rao suggest that investors may anticipate subsequent changes in management personnel, operating policies, and controls that would lead to a reduction in beta. This result does not, however, imply that the agent's *actions* (speculative or otherwise) are inconsistent with the shareholder enrichment *motive* (the hedging hypothesis). The subsequent changes in management may simply address what directors perceive as an agency problem. The changes represent an effort to discourage future illegal activities by the firm's agents. Because of the anticipated managerial changes, a decrease in beta upon the disclosure of illegal activities is not necessarily inconsistent with the hedging hypothesis—the shareholder enrichment motive. Decreases in betas that are the result of corrective actions taken subsequent to the disclosure are easily reconciled with the shareholder enrichment

motive. Even if the market perceives illegal *practices* as speculative, there is nothing inherent in the nature of these pursuits that is inconsistent with the shareholder enrichment *motive*.

Against the hedging and speculative hypotheses is the naive argument that corporate crime is not the result of systematic, deliberate corporate behavior but is, instead, the result of the random acts of a few unscrupulous agents. In this context, corporate crime may be addressed by standard agency theory including appropriate screening processes for recruitment, promotion and compensation policies. As a result, firm value will be affected by agency costs but unaffected (other than by the anticipated fines, fees and penalties) by the initial disclosure of alleged illegal activities. Cloninger refers to this hypothesis as the Rotten Apple Theory (RAT). Under this hypothesis, postdisclosure betas may not differ significantly from their predisclosure counterparts. However, a case could be made that some actions by rogue agents acting on their own behalf could be of such a nature that they significantly affect the firm's systematic risk. Of course, if the rogue agents were acting on the firm's behalf, their actions would fall within the stockholder enrichment motive. A finding of no significant postevent change in beta could be interpreted as consistent with the rotten apple theory or with attempts by agents to enhance share value by hedging the firm's returns.

These hypotheses may be complimentary rather than competing thereby explaining different instances of illegal corporate behavior. Reichert, Lockett, and Rao argue that the issue of which hypothesis is correct is an empirical one. The authors offer no explanation as to why, in a market setting, these hypotheses must be mutually exclusive. It is conceivable that the market may interpret the disclosure of illegal corporate behavior differently depending upon the nature, type and extent of the disclosed activities. A security's beta may rise, fall or remain unchanged as a result of the disclosure of illegal behavior depending upon how the market perceives the disclosure and how any anticipated subsequent managerial changes will impact the security's returns and systematic risk.

Using the data set provided by Karpoff and Lott, the present study tests whether firms accused of engaging in corporate fraud experience any significant changes in their market betas. One objective is to rationalize corporate decisions to commit fraud with the shareholder enrichment motive. Undetected fraud may provide firms with returns in excess of what legal corporate activity would otherwise dictate. In like manner, the fraud may also reduce the legitimate business risk of the firm without a commensurate increase in the risk of disclosure. Karpoff and Lott and others provide evidence of the former. Reichert, Lockett and Rao find similar evidence but fail to discern any significant changes in systematic risk as a result of the disclosures. The empirical tests herein address the issue of whether and how the disclosure of alleged corporate fraud produces a significant impact on the accused firm's market beta. The results of this research provide evidence and additional insight into the question of why corporations engage in criminal activity.

3. Empirical tests

The sample provided by Karpoff and Lott contained 132 cases of corporate fraud involving 71 firms. Using standard event study methodology, we duplicated the results of Karpoff and Lott with respect to returns. Using the same sample of 129 cases in which

complete data were available, we calculated pre- and postdisclosure betas. Because each allegation of fraud may generate multiple announcement dates, the first announcement date defines the predisclosure period, and the last announcement date defines the postdisclosure period. This procedure avoids contaminating the relevant estimation periods. The estimation periods for the beta calculations are the two 100-day periods ranging from $t = -130$ through $t = -31$, where $t = 0$ is the first announcement date appearing in the Wall Street Journal (WSJ) and $t = +31$ through $t = +130$ where $t = 0$ is the last announcement date. In each case the WSJ announcement dates apply to each allegation of fraud as recorded by Karpoff and Lott. The independent variable is the Center for Research in Security Prices (CRSP) value-weighted index of market returns. OLS regression tests employing the CRSP equal-weighted index of market returns produce similar results.

The *t*-test of sample means (assuming unequal variances) yields a marginally significant *t* value of -1.95. This result could be interpreted, using the criteria suggested by Reichert, Lockett, and Rao, as consistent with the speculative hypothesis. However, upon closer inspection, the 129 disclosures included 42 whose betas significantly increased ($t = 6.31$), 22 whose betas did not change significantly ($t = 0.045$), and 65 disclosures whose betas significantly decreased ($t < -7.93$). There appears, therefore, to be a set of disclosures that is consistent with the hedging hypothesis, a set that is consistent with the rotten apple theory and a set that is consistent with the speculative hypothesis. Table 1 provides an analysis of these breakdowns based on the standard error of the entire sample.

Any large sample of means could be partitioned into values that increased, remained the same and decreased. Statistical tests of differences in means depict the significance of the average change. Normally this procedure yields an appropriate solution. However, in the present case the average difference is only marginally significant while both the average decrease and average increase are highly significant. In this case the average change and its significance (or lack thereof) is very likely misleading. The full sample beta change disguises the subsamples results that appear consistent with each of the respective hypotheses. This result is not unlike a community where half of the residents live at near subsistence while the other half live in luxury villas. The average household living at a middle income level does not exist. We interpret the present findings of highly significant but directly opposite changes in beta as unique to the nature and type of events studied.

Table 2 depicts the results of partitioning the sample into quintiles by the size of the predisclosure beta. The first quintile (lowest) betas significantly increased from the predisclosure to the postdisclosure periods ($t = 3.86$) while quintiles three, four and five significantly decreased. The second quintile betas evince no significant change. As the size of the predisclosure beta increases the ratio of postdisclosure betas to predisclosure betas decreases. These results could indicate the presence of measurement errors in predisclosure betas that are resolved over time. The resolution results are also consistent with the disclosure of alleged fraudulent activities by firms. Information contained in the first announcement of alleged fraudulent activity, vis-à-vis time alone, appears to be responsible for the adjustment in beta.

A second possible explanation for this predisclosure beta effect is that investors may perceive that the cessation of corporate fraudulent activities will result in less volatile returns for securities previously identified as high risk (high beta) equities particularly in the

Table 1
Magnitude and significance of beta changes by direction of change

Beta increases				No significant change				Beta decreases			
Firm	Pre-	Post-	*t* val	Firm	Pre-	Post-	*t* val	Firm	Pre-	Post-	*t* val
Health Professionals	0.223	1.046	10.239	Hall Frank B & Co	0.809	0.938	1.60494	Spelling Entertain	1.429	0.885	−6.768
Financial Corp	1.74	2.705	12.006	Thickol Corp	1.43	1.469	0.48521	River Oaks Indus	1.54	1.218	−4.006
Financial Corp	1.554	3.073	18.898	M Corp	0.673	0.747	0.92066	Computer Sciences	1.937	1.369	−7.067
Merrill Lynch	2.395	2.563	2.0902	TRW Corp	1.014	1.057	0.53498	Conner Corp	1.014	0.621	−4.889
Amrep Corp	0.821	1.126	3.7946	Media General	0.388	0.448	0.74648	Paradyne	1.399	0.97	−5.337
ICN Pharmaceuticals	1.574	1.868	3.6578	Fleet Financial	0.575	0.643	0.84601	Pathe Communications	1.583	0.055	−19.01
Dyncorp	1.086	1.236	1.8662	ITT Corp	1.288	1.321	0.41057	ICN Pharmaceuticals	2.04	0.46	−19.66
Litton Industries	0.601	0.887	3.5582	Chase Manhattan	1.111	1.137	0.32348	Merrill Lynch	2.471	0.978	−18.57
Hutton E. F.	0.803	1.141	4.2052	Paine Webber	1.57	1.605	0.43545	ITT	1.182	0.812	−4.603
Interfirst Corp	0.566	1.587	12.703	Rockwell Inter'l	1.193	1.241	0.59719	Thiokol Corp	1.577	1.104	−5.885
Gould Inc	0.984	1.381	4.9392	Washington Water	0.116	0.17	0.67183	Northrop Grumman	0.993	0.794	−2.476
TRN Inc	0.888	1.249	4.4913	Edwards A. G.	2.551	2.582	0.38568	Hutton E. F.	2.958	0.963	−24.82
Security Pacific	0.405	0.836	5.3622	Hutton E. F.	2.82	2.905	1.05752	Primerica	0.918	0.713	−2.55
Paine Webber	1.15	1.292	1.7667	Macmillan	0.899	0.805	−1.1695	Hall Frank	1.18	0.343	−10.41
Bank of Boston	0.745	1.044	3.72	Emerson Electric	1.006	0.877	−1.6049	Financial Corp	2.31	0.501	−22.51
Gould Corp	0.808	1.465	8.174	M Corp	0.935	0.83	−1.3063	General Electric	1.458	1.3	−1.966
Disney Walt Co	1.262	1.907	8.0247	General Motors	0.999	0.984	−0.1866	Paramount	1.193	0.748	−5.536
Johnson Controls	0.85	1.261	5.1134	Warner Comm	1.321	1.269	−0.647	Nalco Chemical	0.802	0.609	−2.401
Northrop Grumman	1.249	1.391	1.7667	Northrop	1.38	1.248	−1.6423	Martin Marietta New	1.377	1.166	−2.625
ITT Corp	0.823	1.105	3.5095	Merrill Lynch	1.314	1.254	−0.7465	Merrill Lynch	2.551	2.314	−2.949
General Electric	1.27	1.761	6.1087	Blount	0.324	0.237	−1.0824	Litton Industries	0.934	0.734	−2.488
Tesoro Petroleum	0.444	0.968	6.5193	ITT	1.173	1.042	−1.6298	Hutton E. F.	3.206	2.963	−3.023
Oak Industries	0.926	1.475	6.8303					Nalco Chemical	0.477	0.268	−2.6
General Foods	0.644	1.792	14.283	Mean	1.131	1.128		Hutton E. F.	1.028	0.191	−10.41
Grace W. R.	0.754	1.488	9.132	Difference			−0.004	General Electric	1.446	1.198	−3.085
Merrill Lynch	1.09	1.282	2.3887	*t* value (c)			−0.05	General Dynamics	1.607	1.451	−1.941
Nalco Chemicals	0.331	0.779	5.5737	Subsample Excess Returns			−0.014	Atlantic Richfield	1.138	0.684	−5.648
Nalco Chemical	0.588	0.739	1.8786					Manufacturers Hanover	1.377	1.002	−4.666
Primerica	0.72	0.927	2.5754					Manufacturers Hanover	1.377	0.805	−7.116
Hutton E. F.	2.18	2.956	9.6545					Citicorp	1.958	0.796	−14.46
Continental Bank	0.352	0.499	1.8289					Advent	2.458	2.247	−2.625
General Electric	1.394	1.566	2.1399					Dravo Corp	0.708	0.374	−4.155
Textron	0.746	1.603	10.662					Chrysler	1.696	1.39	−3.807
Primerica	0.831	1.275	5.524					Hutton E. F.	1.3	0.085	−15.12

(continued on next page)

Table 1 *(continued)*

Beta increases				No significant change				Beta decreases			
Firm	Pre-	Post-	*t* val	Firm	Pre-	Post-	*t* val	Firm	Pre-	Post-	*t* val
Chubb	0.625	1.439	10.127					Johnson & Johnson	1.372	1.052	−3.981
Westinghouse	1.93	2.073	1.7791					Merrill Lynch	1.294	1.096	−2.463
Rockwell	1.167	1.447	3.4836					Primerica	1.291	0.976	−5.163
Continental Bank	0.211	1.326	13.872					Hutton E. F.	0.93	0.298	−7.863
General Electric	1.336	1.761	5.2876					Merrill Lynch	2.247	1.25	−12.4
M Corp	0.363	1.044	8.4726					Johnson & Johnson	1.193	1.048	−1.804
Edwards A. G.	1.431	2.316	11.011					Paine Webber	3.102	2.037	−13.25
Merrill Lynch	1.991	2.374	6.1336					Bankamerica	1.824	0.589	−15.37
								Paine Webber Group	1.66	1.165	−6.158
Mean	0.994	1.501						Merrill Lynch	2.311	1.049	−15.7
Difference			0.507					Merrill Lynch	1.516	1.354	−2.016
t value (+)			6.313					Atlantic Richfield	0.841	0.51	−4.118
Subsample Excess Returns			−0.025					CNA Financial	1.759	1.419	−4.23
								Eaton Corp	1.168	0.754	−5.151
								Merrill Lynch	2.762	2.364	−4.952
Total Difference			−0.14					Morgan JP	1.504	1.079	−5.288
t value (Total Sample)			−1.95					BankAmerica	1.869	0.574	−16.11
								Martin Marietta	1.72	0.79	−11.57
								Primerica	1.158	0.857	−3.745
								GTE	1.105	0.714	−4.865
								Ogden	1.129	0.545	−7.266
								Pepsico	1.294	0.94	−5.648
								MDC Holdings	0.261	−0.32	−7.278
								Hutton E. F.	3.038	1.24	−22.37
								Atlantic Richfield	1.378	0.563	−10.14
								Hutton E. F.	2.628	0.833	−22.33
								GTE	1.232	0.903	−4.093
								General Dynamics	1.724	0.62	−13.74
								Northrop	1.469	1.062	−5.064
								Baldwin United	0.806	0.285	−6.482
								Gould	1.672	0.922	−9.331
								Mean	1.567	0.93	
								Difference			−0.64
								t value (−)			−7.92
								Subsample Excess Returns			−0.017

Table 2
Comparison of predisclosure and postdisclosure betas by size of predisclosure betas

Quintile	Beta	Difference	(*t*-statistic) Standard Error	Probability	N
1					
Pre-Beta	0.517		(3.80)*		26
Post-Beta	0.858	0.3411	0.0898	0.000826	
2					
Pre-Beta	0.940		(−0.06)		26
Post-Beta	0.936	−0.0042	0.0742	0.955926	
3					
Pre-Beta	1.240		(−2.36)†		26
Post-Beta	1.051	−0.1888	0.0800	0.026826	
4					
Pre-Beta	1.518		(−2.38)†		26
Post-Beta	1.240	−0.2779	0.1168	0.025326	
5					
Pre-Beta	2.357		(−3.89)*		25
Post-Beta	1.684	−0.6733	0.1730	0.000725	

* Significant at the 1% level.
† Significant at the 5% level.

presence of anticipated changes in management personnel, policies and controls. This interpretation is consistent with Clarkson and Thompson (1990), who found that the release of additional information on securities that possess little information reduces the uncertainty about the exact parameters of the return distributions thereby resulting in beta decreases. On the other hand, investors may perceive that securities enjoying highly stable returns (low betas) may have achieved that stability through the use of certain types of corporate fraud. If so, investors could reasonably anticipate an increase in the firm's systematic risk (beta) upon the cessation of the fraudulent activities. In these cases, any anticipated change in management may be perceived as destabilizing.

Third, if investors perceive that certain unscrupulous agents are the cause of the alleged instances of corporate fraud, then the equity value would be affected only to the extent of the agency costs and any anticipated fines, fees, and penalties associated with the illegal activities. In such case, no significant difference between post- and predisclosure betas would be expected. unless, of course, the actions of the rogue agents were so perverse that there were destablizing to the firm's market returns.

Using paired *t* tests, partitioning the sample into quintiles by the relative size of the average prediction error, the dollar value of the market equity, and the dollar size of the residuals yields no consistent or systematic significant differences between pre- and postevent betas. Further, partitioning by type of fraud (defined by Karpoff and Lott as government, stakeholder, regulatory, and financial) also fails to produce any significant differences between pre- and postdisclosure betas. (See Karpoff and Lott for detailed definitions of each fraud type.)

To determine whether announcements of allegations of fraud affect market betas independently of predisclosure beta size, we estimate the regressions suggested by the valuation

results of Reichert, Lockett, and Rao (1996). The dependent variable is the natural logarithm of the ratio of postdisclosure beta to predisclosure beta. Dummy variables that assume a value of 1 for various fraud types and 0 otherwise are included as explanatory variables.

PREBETA is the ordinary least squares (OLS) estimate of the firm's beta for a 100 day period consisting of day t 130 through day t 31 relative to the first WSJ announcement of fraud. The hedging hypothesis suggests PREBETA should be negative. To test whether effects are greater for smaller firms, the market value of the firm, LOGEQUITY, is included and is the log of the market value of equity two days preceding the first report of fraud. The market value is calculated as the product of the stock price on day $t = -2$ relative to the first WSJ announcement of fraud and the number of outstanding shares. To test whether similar effects exist for firms with smaller excess returns, the average stock return forecast error, RETURN, for the two-day interval consisting of the day the first report of fraud appears and the immediately preceding day is specified as a variable. The financial intermediation literature suggests the reputational penalties of lower values and higher market betas imposed on financial firms may be greater than the penalties imposed on nonfinancial firms (Allen and Santomero, 1997). To test whether effects are greater for financial firms, FINCFIRM is included as a variable and assumes a value of 1 if the announcing firm is a financial firm and 0 otherwise.

We included qualitative variables in the regression specifications to test whether fraud announcements affected market betas independently of other factors, particularly size of predisclosure beta. GOVFRAUD assumes a value of 1 for those events consisting of government procurement fraud or government program fraud and 0 otherwise. REGFRAUD assumes a value of 1 for those corporate activities that violate federal or state laws, but may not be material to stakeholders, and 0 otherwise. FINFRAUD assumes a value of 1 when there are fraudulent misrepresentations in financial statements and 0 otherwise. STKFRAUD assumes a value of 1 when actions are taken by agents of the corporation to defraud customers, employees, suppliers, or franchises and 0 otherwise.

The regression results identify four variables with statistically significant coefficients that are not identified by the paired t tests—GOVFRAUD, REGFRAUD, FINFRAUD, and STKFRAUD. GOVFRAUD, REGFRAUD, and STKFRAUD are positive and significant at the 1% level (Table 3), suggesting beta changes are larger for these announcements relative to announcements of financial reporting fraud. Similarly, the FINFRAUD coefficient is negative and significant at the 1% level suggesting beta changes are relatively smaller than those for frauds of government, stakeholders, and regulators. The coefficients for LOGEQUITY, RETURN, and FINCFIRM are not statistically significant at the usual confidence levels. The results are robust in numerous tests using various combinations of the explanatory variables. Table 3 provides a summary analysis of the regression results.

Three findings emanate from the statistical analysis. First, there appears to be three distinct types of disclosures: those in which betas significantly increase, those where betas significantly decrease and those where betas do not change significantly. Second, the size of the predisclosure beta appears to determine the direction and magnitude of the change in beta. Third, the fraud type influences the direction and magnitude of the beta shift with financial fraud more likely to be associated with post disclosure decreases in beta.

These empirical results suggest that there are only two viable hypotheses regarding the

Table 3
Cross-sectional regressions to measure the effect on changes in beta of prior beta levels, firm size, excess returns, firm type, and fraud type

Equation 1		Equation 2	
Variable	Coefficient	Variable	Coefficient
PREBETA	−0.4579	PREBETA	−0.4613
	(−4.83)*		(−4.94)*
LOGEQUITY	0.0018	LOGEQUITY	0.0041
	(0.04)		(0.11)
RETURN	−1.1518	RETURN	−1.1663
	(−1.17)		(−1.21)
FINCFIRM	0.1277	FINCFIRM	0.1265
	(0.87)		(1.02)
GOVFRAUD	0.5854	FINFRAUD	−0.5749
	(2.61)*		(−2.87)*
STKFRAUD	0.5479		
	(2.60)*		
REGFRAUD	0.64451		
	(2.68)*		
INTERCEPT	−0.1619	INTERCEPT	0.4041
	(−0.49)		(1.29)
R2	0.2457	R2	0.2433
F	(5.58)*	F	(7.85)*

*Significant at the 1% level.

Results of ordinary least squares regressions (OLS) where the logarithm of the postdisclosure/predisclosure beta ratio is the dependent variable for a sample of 129 announcements of fraud. The independent variables are defined as follows: PREBETA is the ordinary least squares (OLS) estimate of the firmís beta for a 100-day period consisting of day *t* 130 through day *t* 31 relative to the first *Wall Street Journal* announcement of fraud. RETURN is the average stock return forecast error for the two-day interval consisting of the day the first report of fraud appears and the immediately preceding day. LOGEQUITY is the log of the market value of equity two days preceding the first report of fraud. GOVFRAUD assumes a value of 1 for those events consisting of government procurement fraud or government program fraud and 0 otherwise. REGFRAUD assumes a value of 1 for those corporate activities that violate federal or state laws, but may not be material to stakeholders, and 0 otherwise. FINFRAUD assumes a value of 1 when there are fraudulent misrepresentations in financial statements and 0 otherwise. STKFRAUD assumes a value of 1 when actions are taken by agents of the corporation to defraud customers, employees, suppliers, or franchises and 0 otherwise. FINCFIRM assumes a value of 1 if the announcing firm is a financial firm and 0 otherwise.

possible motive for corporate fraud: the hedging hypothesis and the rotten apple theory and that both of these hypotheses may be simultaneously at work in the market. The rotten apple theory is a clear example of agency problems extensively addressed in the literature. The speculative hypothesis can be interpreted as a special case of the hedging hypothesis where agents attempt to hedge the firm's returns at the expense of its risk.

An argument could be made that the distinctions among the various theories of errant behavior are not particularly useful because, regardless of its cause, the behavior taints the firm's reputation thereby inducing wealth losses on the part of shareholders. The distinctions among the theories are important because of the implication the possible motives have for future behavior. If illegal acts are random occurrences, the implications for future policy are one thing while if the acts are the result of systematic practices and policies, the implications

are quite different. Ascribing motives for errant corporate behavior is important because their knowledge can lead to changes that lessen the likelihood of future occurrences.

4. The hedging story

In those disclosures in which an agency problem is not an issue, the market discovers a history of alleged corporate fraudulent activities. Presuming that the disclosure of these activities reduces the likelihood of and the extent to which the firm will be able to pursue these activities in the future (in addition to any associated fines, fees and penalties), the market reacts by lowering the equity value resulting in a downward adjustment in the security's return or a change in its systematic risk. For those securities whose predisclosure betas are the lowest, the market increases their systematic risk upon the disclosure. As a result of the increase in beta, the required return is higher and consistent with the decreased share price. On the other hand, for those securities whose predisclosure betas are the greatest, the market decreases their systematic risk. In the absence of any fines, fees, and penalties and concomitant reputational costs, the lower beta would translate into lower required returns and smaller (even positive) changes in market value.

The regression tests also indicate that the market discriminates between disclosures of financial and nonfinancial firms. In cases where the disclosures involve securities possessing low predisclosure betas, market reactions increase the beta in line with the significant reduction in share price. The likelihood of this result increases if the securities involved are financial and involve regulatory fraud. In cases where the disclosures involve securities possessing high predisclosure betas, market reactions significantly lower systematic risk and hence the required return. In the absence of anticipated fines, fees, penalties and reputational losses, share price could even rise. The likelihood of the latter result increases if the securities involved are nonfinancial. In either case, the change in equity value reflects the reduced anticipated earnings caused by the cessation of illegal activities and any associated fines, fees and penalties. In sum, the downward adjustment in the value of the securities results in an upward adjustment in the systematic risk of previously low beta stocks and a significant downward adjustment in the betas of previously high beta stocks.

The securities that experiences significant increases in beta and concomitant decreases in share price clearly are consistent with the hedging hypothesis. These disclosures suggest that the low pre-event betas enjoyed by this group were, in part, the result of the predisclosed fraudulent activities. Any subsequent changes in management personnel, operating policies and controls would thereby be perceived as destabilizing, vis-à-vis, predisclosure returns. On the other hand, the market reacts in a manner to reduce previously high beta values because of the perception that the anticipated changes in management personnel, policies and controls will be stabilizing. In sum, investors interpret any anticipated managerial changes and the cessation of the fraudulent activities as destabilizing for previously low beta stocks and stabilizing for previously high beta stocks. Both of these ex post events can be reconciled with the ex ante stockholder enrichment motive leading to the conclusion that decreases in beta do not conclusively support the speculative hypothesis (as a mutually exclusive theory) nor do they necessarily refute the hedging hypothesis.

5. Summary

This article attempts to determine the effect of the disclosure of alleged corporate fraud on a security's systematic risk. Analysis of 129 cases of alleged corporate fraud yield three distinct outcomes: 42 cases where beta significantly increases after the disclosure, 22 cases where beta does not significantly change and 65 cases where beta significantly decreases. Further analysis indicates that the size of the predisclosure beta, the amount of the abnormal return, the market value of the equity and the type of firm significantly affect the difference between post- and predisclosure betas. In those cases where beta increases (an outcome predicted by the hedging hypothesis) the more likely it is that the residuals are significantly negative, the market value smaller, the predisclosure beta lower and that the firm is a financial institution. In those cases where beta decreases, the more likely it is that the residuals are insignificantly negative, the market value of the firm greater, the pre-event beta higher and that the firm is a nonfinancial corporation.

Because changes in beta vary inversely with the size of pre-event betas, significant increases and decreases in beta can be reconciled with the hedging hypothesis. The high pre-event betas fall in anticipation of corrective managerial changes and low pre-event betas rise because the market perceives the anticipated managerial changes and the attendant loss of hedging opportunities as destabilizing. Additionally, the perception by the market of illegal activities as speculative does not preclude the presence of the shareholder enrichment motive.

6. Implications for corporate policy

Significant negative abnormal returns and significant increases in systematic risk coincident with the disclosure of illegal corporate behavior are unambiguously consistent with the shareholder enrichment motive. Because a decrease in systematic risk is coincident with high predisclosure betas, this result can be reconciled with the shareholder enrichment motive or The Hedging Hypothesis. Insignificant changes in returns or systematic risk are evidence consistent with an agency problem or RAT. Corporate policy has a long and continuing relationship with agency theory. The conventional wisdom with regard to illegal or unethical corporate behavior has naively treated all such behavior as an agency problem. There is, however, an alternative hypothesis, the theory that some agents pursue the goal of share price maximization through a variety of means, including illegal and unethical acts. If this alternative hypothesis is correct, then the goal of share price enhancement should be respecified.

Adequate specification of the moral and legal constraints within which the goal of share price enhancement exists should counter the incentive for agents to resort to illegal behavior. However, Cloninger (1995) argues that in the presence of asymmetric information and in accordance with chaos theory, the mere specifying of constraints is insufficient. Because asymmetric information provides agents with the opportunity to engage in illegal activities and the share price maximization goal provides the motive, Cloninger argues that the goal of share price maximization should be replaced with the goal of maximization of stakeholder

value. In this context, any policy or practice that benefits one group of stakeholders at the expense of another without due compensation violates the goal with which agents have been charged. Chaos theory holds, in part, that the pursuit of a goal is the major motivating force behind agent behavior. Goals that are consistent with ethical standards are more likely to result in managerial behavior consistent with those standards.

Acknowledgments

We would like to express our appreciation to Professor Jonathan M. Karpoff, University of Washington and Professor John R. Lott, Jr., University of Chicago Law School for sharing their data set and providing numerous useful comments and suggestions on earlier drafts. We assume full responsibility for any remaining errors or omissions.

References

Allen, F., & Santomero, A. M. (1997). The theory of financial intermediation. *J Banking Finance, 21,* 1461–1485.

Becker, Gary S. (1968) Crime and punishment: an economic approach. *Journal of Political Economy,* 78, 199–217.

Clarkson, P. M., & Thompson, R. (1990). Empirical estimates of beta when investors face estimation risk. *J Finance, 45,* 431–453.

Cloninger, D. O. (1995). Managerial goals and ethical behavior. *Financial Practice Education, 5,* 50–59.

Cloninger, D. O. (1990). Arson and abandonment: a restatement. *J Risk Insurance, 57,* 540–545.

Cloninger, D. O., Skantz, T. R., & Strickland, T. H. (1987). Price fixing and legal sanctions: the stockholder enrichment motive. *Antitrust Law Econ Rev, 19,* 17–24.

Cloninger, D. O. (1985a). An analysis of the effect of illegal corporate activity on share value. *J Behav Econ, (Summer), 1–11.*

Cloninger, D. O. (1985b). Moral risk and share value: the case of IBM and Hitachi. *So Bus Rev (Spring), 1–13,*

Cloninger, D. O. (1982). Moral and systematic risk: a rationale for unfair business practice. *J Behav Econ, (Winter), 33–49.*

Cloninger, D. O. (1981). Risk, arson and abandonment. *J Risk Insurance, (September), 494–503.*

Ehrlich, I. (1973) Participation in illegitimate activities: a theoretical and empirical investigation. *Journal of Political Economy,* (May/June), 521–564.

Henderson, G. (1990). Problems and solurtions in conducting event studies. *J Risk Insurance, 57,* 282–306.

Karpoff, J. M., & Lott, J. R. Jr. (1993). The reputational penalty firms bear from committing criminal fraud. *J Law Econ, 34,* 757–802.

Lean, D. F., Ogur, J. D., & Rodgers, R. P. (1985). Does collusion pay. . . does antitrust work. *So Econ J, 51,* 828–839.

Oppenheimer, H. R., & Stanley, M. (1989). The impact of crime-related disclosures on firm value. Southern Finance Association, Orlando, Florida.

Reichert, A., Lockett, M., & Rao, R. (1996). The impact of illegal business activity on shareholder wealth. *Financial Rev, 31,* 67–85.

Robichek, A., & Van Horne, J. C. (1967). Abandonment value and capital budgeting. *J Finance, 22,* 577–589.

Skantz, T. R., Cloninger, D. O., & Strickland, T. H. (1990). Price-fixing and shareholder returns: an empirical study. *Financial Rev, 25,* 153–164.

Strachan, J. L., Smith, D. B., & Beedles, W. L. (1983). The price reaction to (alleged) corporate crime. *Financial Rev, 18,* 121–132.