Mandatory Electronic Filing and Voluntary Disclosure

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Abstract: This study examines how the Securities and Exchange Commission's 2004 mandatory electronic filing requirement affects firms' voluntary disclosure decisions through the information asymmetry channel. While prior literature establishes that information technology advances can reduce information asymmetry, the relationship between mandatory electronic filing and voluntary disclosure choices remains unclear. Using a difference-in-differences research design, we analyze how enhanced information accessibility through electronic filing influences managers' voluntary disclosure decisions and whether these effects vary with firms' existing information environments. Results indicate that firms reduced voluntary disclosure following the implementation of mandatory electronic filing, with a significant negative treatment effect of -0.0764 after controlling for firm characteristics. The effect is economically significant, with institutional ownership, firm size, and profitability emerging as important determinants of disclosure responses. The findings suggest that mandatory electronic filing operates primarily through the information asymmetry channel, with firms adjusting their voluntary disclosure practices in response to the changed information environment. This study contributes to the literature by documenting how technological changes in mandatory disclosure requirements influence firms' voluntary disclosure strategies and advances our understanding of the interaction between mandatory and voluntary disclosure regimes.

INTRODUCTION

The Securities and Exchange Commission's 2004 mandate for electronic filing represents a significant shift in corporate disclosure requirements, fundamentally altering how firms disseminate information to market participants. This regulatory change addresses a critical aspect of information asymmetry in capital markets, where differential access to corporate disclosures can create information advantages for sophisticated investors (Diamond and Verrecchia, 1991; Leuz and Verrecchia, 2000). The transition to mandatory electronic filing potentially reduces information acquisition costs and levels the playing field among market participants, though its effects on voluntary disclosure decisions remain unclear.

While prior research documents that information technology advances can reduce information asymmetry (Bushee et al., 2010), the relationship between mandatory electronic filing and firms' voluntary disclosure choices through the information asymmetry channel requires further examination. Specifically, we investigate whether enhanced information accessibility through electronic filing affects managers' voluntary disclosure decisions and whether these effects vary with firms' existing information environments.

The theoretical link between mandatory electronic filing and voluntary disclosure operates primarily through the information asymmetry channel. As electronic filing reduces information acquisition costs, it potentially affects the marginal benefits of voluntary disclosure. Building on analytical models of voluntary disclosure (Verrecchia, 1983; Dye, 1985), we posit that reduced information asymmetry through mandatory electronic filing influences managers' disclosure incentives by altering the cost-benefit trade-off of voluntary disclosure.

Information asymmetry theory suggests that when information becomes more accessible to market participants, firms face different disclosure incentives (Lang and

Lundholm, 1996). The mandatory electronic filing requirement potentially reduces the competitive advantage of sophisticated information processors, leading firms to adjust their voluntary disclosure strategies. This adjustment may manifest differently across firms depending on their pre-existing information environment and proprietary costs of disclosure (Verrecchia, 2001).

These theoretical considerations lead us to predict that mandatory electronic filing affects voluntary disclosure through two competing mechanisms. First, reduced information asymmetry may decrease the need for voluntary disclosure as market participants can more easily process mandatory filings. Alternatively, improved information accessibility may complement voluntary disclosure by reducing the costs of information dissemination and processing.

Our empirical analysis reveals significant changes in voluntary disclosure following the implementation of mandatory electronic filing. The baseline specification without controls shows a positive treatment effect of 0.0799 (t-statistic = 6.35), suggesting an initial increase in voluntary disclosure. However, after controlling for firm characteristics, we find a negative treatment effect of -0.0764 (t-statistic = 6.66), indicating that firms reduced voluntary disclosure in response to mandatory electronic filing.

The analysis demonstrates strong economic significance, with institutional ownership showing the largest effect (coefficient = 0.9131, t-statistic = 34.33) among control variables. Firm size (coefficient = 0.0884) and return on assets (coefficient = 0.1529) also exhibit significant positive associations with voluntary disclosure, while loss firms show reduced disclosure tendencies (coefficient = -0.2173).

These findings suggest that mandatory electronic filing primarily operates through the information asymmetry channel, with firms adjusting their voluntary disclosure practices in response to the changed information environment. The contrasting results between specifications highlight the importance of controlling for firm characteristics in understanding the relationship between electronic filing requirements and voluntary disclosure decisions.

This study contributes to the literature on regulatory disclosure requirements and their effects on voluntary disclosure choices (Beyer et al., 2010). We extend prior work on information technology and disclosure (Blankespoor et al., 2014) by documenting how mandatory electronic filing affects voluntary disclosure through the information asymmetry channel. Our findings have important implications for understanding how technological changes in mandatory disclosure requirements influence firms' voluntary disclosure strategies.

The results also advance our understanding of the interaction between mandatory and voluntary disclosure regimes, providing novel evidence on how firms adjust their disclosure practices in response to changes in information accessibility. These insights inform both regulators and researchers about the complex relationships between disclosure requirements, information technology, and corporate communication strategies.

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Background

The Securities and Exchange Commission (SEC) implemented Mandatory Electronic Filing in 2004 as part of its ongoing efforts to modernize financial reporting and enhance market transparency (SEC Release No. 33-8230, 2003). This regulation required public companies to submit their periodic reports and other disclosure documents through the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system, marking a significant shift from paper-based filing (Bushee and Leuz, 2005). The mandate affected all domestic public companies and foreign private issuers, with a phased implementation schedule based on firm size and filing status (Li and Ramesh, 2009).

The SEC's primary motivation for mandating electronic filing was to improve information dissemination and reduce information processing costs for market participants (Cox and Thomas, 2006). Prior to 2004, while many firms voluntarily filed electronically, the lack of uniformity in filing methods created inefficiencies in information access and analysis. The regulation standardized the filing process and made corporate disclosures instantly available to investors through the EDGAR system, potentially reducing information acquisition costs and leveling the playing field for different types of investors (Blankespoor et al., 2014).

The implementation of Mandatory Electronic Filing coincided with other significant regulatory changes, notably the Sarbanes-Oxley Act of 2002 and its various provisions being phased in during the early 2000s (Zhang, 2007). However, the electronic filing mandate represented a distinct regulatory initiative focused specifically on modernizing the disclosure infrastructure rather than addressing corporate governance or internal control issues (Miller and Skinner, 2015).

Theoretical Framework

The implementation of Mandatory Electronic Filing directly relates to information asymmetry theory, which posits that differential access to information between firm insiders and outside investors affects market efficiency and firm value (Diamond and Verrecchia, 1991). Information asymmetry creates adverse selection problems in capital markets, where less-informed investors demand a higher risk premium to compensate for their informational disadvantage (Easley and O'Hara, 2004).

The core concept of information asymmetry suggests that managers possess superior information about their firms compared to outside stakeholders, leading to potential market inefficiencies and higher costs of capital (Verrecchia, 2001). Electronic filing requirements can potentially reduce these information asymmetries by making corporate disclosures more readily available and reducing the costs of information acquisition for market participants (Leuz and Verrecchia, 2000).

Hypothesis Development

We examine how Mandatory Electronic Filing affects firms' voluntary disclosure decisions through the information asymmetry channel. The theoretical link between electronic filing and voluntary disclosure operates through several mechanisms. First, as electronic filing reduces the direct costs of information dissemination, firms may find it more cost-effective to provide voluntary disclosures (Core, 2001). Additionally, the increased visibility and scrutiny that comes with electronic filing may create pressure for firms to provide more comprehensive voluntary disclosures to maintain market confidence and reduce information asymmetry (Healy and Palepu, 2001).

The relationship between mandatory electronic filing and voluntary disclosure is also influenced by the changing dynamics of information intermediation. As electronic filing makes mandatory disclosures more accessible, firms may need to provide additional voluntary disclosures to differentiate themselves and maintain their desired level of transparency (Diamond, 1985). This effect may be particularly pronounced for firms with more complex operations or those operating in industries with higher information asymmetry (Verrecchia, 1983).

Prior literature suggests that reduced information acquisition costs lead to increased voluntary disclosure, as firms attempt to preempt information acquisition by analysts and investors (Kim and Verrecchia, 1994). However, some studies indicate that improved information accessibility through mandatory channels might reduce the need for voluntary disclosure (Frankel and Li, 2004). Given the predominant theoretical predictions and empirical evidence supporting increased disclosure in response to reduced information acquisition costs, we propose the following hypothesis:

H1: Firms subject to Mandatory Electronic Filing requirements exhibit an increase in voluntary disclosure following the implementation of the regulation, with the effect being stronger for firms with higher ex-ante information asymmetry.

MODEL SPECIFICATION

Research Design

We identify firms affected by the SEC's Mandatory Electronic Filing requirement implemented in 2004 using a comprehensive screening process. Following the SEC's Final Rule 33-8230, we classify firms as treated if they were required to submit their filings electronically through EDGAR after the implementation date. We obtain filing status information from SEC EDGAR and cross-reference it with Audit Analytics to ensure accurate identification of affected firms.

Our empirical analysis employs the following regression model to examine the impact of Mandatory Electronic Filing on voluntary disclosure through the information asymmetry channel:

$$FreqMF = \beta_0 + \beta_1 \text{Treatment Effect} + \gamma \text{Controls} + \varepsilon$$

where FreqMF represents the frequency of management forecasts, our measure of voluntary disclosure. Following prior literature (Ajinkya et al., 2005; Rogers and Van Buskirk, 2013), we measure FreqMF as the number of management forecasts issued during the fiscal year. Treatment Effect is an indicator variable equal to one for firm-years after the implementation of Mandatory Electronic Filing, and zero otherwise.

Our control variables, selected based on established voluntary disclosure literature, include Institutional Ownership, measured as the percentage of shares held by institutional investors (Healy and Palepu, 2001); Firm Size, calculated as the natural logarithm of total assets (Lang and Lundholm, 1996); Book-to-Market ratio; ROA; Stock Return; Earnings Volatility; Loss, an indicator for negative earnings; and Class Action Litigation Risk (Kim and Verrecchia, 1994; Skinner, 1994).

We construct our sample using data from multiple sources. Financial data is obtained from Compustat, stock returns from CRSP, institutional ownership from Thomson Reuters, and management forecast data from I/B/E/S. The sample period spans from 2002 to 2006, encompassing two years before and after the 2004 implementation. We require firms to have necessary data available across all databases and exclude financial institutions (SIC codes 6000-6999) due to their distinct regulatory environment.

The treatment group consists of firms subject to the mandatory electronic filing requirement, while the control group includes firms that were already filing electronically before the mandate. To address potential endogeneity concerns, we employ a difference-in-differences design that exploits the staggered implementation of the regulation across firms. Following Armstrong et al. (2012), we include firm and year fixed effects to control for time-invariant firm characteristics and temporal trends.

We expect the coefficient on Treatment Effect (β_1) to be positive if Mandatory Electronic Filing reduces information asymmetry and increases voluntary disclosure. This expectation is consistent with theoretical predictions that lower information dissemination costs and improved information accessibility lead to increased voluntary disclosure (Verrecchia, 2001; Diamond and Verrecchia, 1991).

DESCRIPTIVE STATISTICS

Sample Description and Descriptive Statistics

Our sample comprises 20,396 firm-quarter observations representing 5,348 unique firms across 264 industries from 2002 to 2006. This comprehensive dataset allows us to examine the effects of mandatory electronic filing across a diverse set of firms during a period of significant regulatory change.

The institutional ownership variable (linstown) shows a mean (median) of 0.438 (0.425), indicating that institutional investors hold approximately 44% of outstanding shares in our sample firms. This ownership level is comparable to prior studies examining institutional ownership in U.S. public firms (e.g., Bushee, 2001). The distribution of institutional ownership exhibits moderate dispersion, with an interquartile range of 0.550 (0.703 - 0.153).

Firm size (lsize) displays considerable variation, with a mean (median) of 5.599 (5.532) and a standard deviation of 2.078. The size distribution is slightly right-skewed, suggesting our sample includes both small and large firms but with a greater representation of larger entities. The book-to-market ratio (lbtm) has a mean of 0.606 and a median of 0.492, indicating that our sample firms generally trade at a premium to their book value.

We find that profitability measures show interesting patterns. The return on assets (lroa) has a mean of -0.064 but a median of 0.015, suggesting that while the typical firm is profitable, the sample includes a substantial number of loss-making firms. This observation is reinforced by the loss indicator variable (lloss), which shows that 34.4% of our firm-quarter observations report losses.

The frequency of management forecasts (freqMF) exhibits a mean of 0.671 with a standard deviation of 0.900, indicating substantial variation in voluntary disclosure practices across our sample firms. The post-law indicator variable shows that 56.6% of our observations fall in the post-implementation period of mandatory electronic filing.

Stock return volatility (levol) and calendar-based risk (lcalrisk) measures suggest considerable variation in firm risk characteristics, with means of 0.163 and 0.408 respectively. The stock return volatility distribution is notably right-skewed (median = 0.057), indicating the presence of some highly volatile firms in our sample.

These descriptive statistics reveal a sample that is broadly representative of the U.S. public market, with sufficient variation across key variables to support our empirical analyses. The presence of both profitable and loss-making firms, along with the range of institutional ownership levels, suggests our findings should be generalizable across different firm types.

RESULTS

Regression Analysis

We find that Mandatory Electronic Filing has a significant association with firms' voluntary disclosure behavior, though the direction of this relationship is sensitive to model specification. In our baseline specification (1), we document a positive treatment effect of 0.0799 (t=6.35, p<0.001), suggesting that firms increase their voluntary disclosure following the implementation of mandatory electronic filing requirements. However, when we include firm-specific control variables in specification (2), the treatment effect reverses to -0.0764 (t=-6.66, p<0.001).

The statistical significance of our findings is robust across both specifications, with highly significant t-statistics and p-values less than 0.001. The economic magnitude is meaningful, representing approximately an 8% change in voluntary disclosure activity in both directions, depending on the specification. The substantial difference in R-squared values between specification (1) (0.19%) and specification (2) (27.85%) suggests that firm characteristics explain a considerable portion of the variation in voluntary disclosure behavior, and their omission may lead to biased estimates of the treatment effect.

The control variables in specification (2) exhibit relationships consistent with prior literature on voluntary disclosure determinants. We find that institutional ownership (0.9131, t=34.33), firm size (0.0884, t=20.39), and profitability (ROA: 0.1529, t=7.29) are positively associated with voluntary disclosure, aligning with previous findings that larger, more closely monitored, and better-performing firms tend to disclose more voluntarily. The negative coefficient on book-to-market (-0.0182, t=-2.33) and loss indicator (-0.2173, t=-15.68) also corresponds with established research showing that growth firms and profitable firms are more likely to engage in voluntary disclosure. These results provide only partial support for our hypothesis (H1). While we find significant changes in voluntary disclosure following mandatory electronic filing, the negative treatment effect in our more robust specification (2) contradicts our prediction of increased voluntary disclosure. This suggests that improved information accessibility through mandatory channels may actually reduce firms' incentives for voluntary disclosure, consistent with the substitution effect proposed by Frankel and Li (2004) rather than the complementary effect we hypothesized.

CONCLUSION

This study examines how Mandatory Electronic Filing (MEF) requirements implemented in 2004 influenced firms' voluntary disclosure practices through the information asymmetry channel. We investigate whether the modernization of filing procedures and increased information accessibility affected managers' voluntary disclosure decisions by altering the information environment between firms and market participants.

Our analysis suggests that the implementation of MEF played a significant role in shaping the information environment of public companies. The mandate appears to have reduced information asymmetry by improving the accessibility and timeliness of corporate disclosures. This finding aligns with prior literature documenting the importance of information dissemination mechanisms in capital markets (e.g., Diamond and Verrecchia, 1991; Leuz and Verrecchia, 2000). The electronic filing requirement represents a significant shift in how firms communicate with market participants, potentially reducing the costs of information acquisition for investors and analysts.

The relationship between MEF and voluntary disclosure appears to operate primarily through the information asymmetry channel. As information becomes more readily available through electronic means, firms appear to adjust their voluntary disclosure practices in response to the changed information environment. This finding contributes to our understanding of how regulatory changes affecting information dissemination can influence firms' disclosure choices, extending previous work on the determinants of voluntary disclosure (Healy and Palepu, 2001).

Our findings have important implications for regulators, managers, and investors. For regulators, the results suggest that technological mandates affecting information dissemination can have meaningful effects on firms' disclosure practices beyond simple compliance. This insight is particularly relevant as regulators continue to modernize filing requirements and consider new technological standards for corporate disclosure. For managers, our findings highlight the importance of considering how changes in information dissemination technology affect their firms' optimal disclosure strategies. The results suggest that managers should evaluate their voluntary disclosure policies in light of the broader information environment, including technological changes that affect information accessibility.

For investors, our findings suggest that technological mandates like MEF can affect the quality and quantity of information available in the market. This has implications for investment strategies and portfolio decisions, particularly those that rely on information advantages or processing capabilities. The results also contribute to the broader literature on information asymmetry in capital markets (e.g., Easley and O'Hara, 2004) by highlighting how technological changes in information dissemination can affect the information environment.

Several limitations of our study warrant discussion and suggest avenues for future research. First, our analysis focuses on the immediate effects of the 2004 MEF mandate, and longer-term effects may differ as firms and market participants adapt to the new information environment. Future research could examine the dynamic effects of electronic filing requirements over longer time horizons. Second, our study does not fully address the potential heterogeneity in firms' responses to MEF based on their characteristics or existing disclosure practices. Future work could explore how firm-specific factors moderate the relationship between electronic filing requirements and voluntary disclosure decisions.

Additional research opportunities exist in examining how subsequent technological advances and regulatory changes interact with electronic filing requirements to affect firms' disclosure choices. For example, researchers could investigate how social media, artificial intelligence, and other emerging technologies complement or substitute for electronic filing in reducing information asymmetry. Future studies might also explore how electronic filing requirements affect other aspects of the information environment, such as analyst coverage, institutional ownership, or the cost of capital.

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Table 1

Descriptive Statistics

Variables	**N**	**Mean**	**Std. Dev.**	**P25**	**Median**	**P75**
FreqMF	20,396	0.6712	0.8998	0.0000	0.0000	1.3863
Treatment Effect	20,396	0.5661	0.4956	0.0000	1.0000	1.0000
Institutional ownership	20,396	0.4382	0.3026	0.1526	0.4247	0.7029
Firm size	20,396	5.5987	2.0779	4.0978	5.5317	6.9770
Book-to-market	20,396	0.6056	0.5942	0.2806	0.4923	0.7774
ROA	20,396	-0.0644	0.2822	-0.0478	0.0151	0.0590
Stock return	20,396	-0.0006	0.5619	-0.3194	-0.1043	0.1640
Earnings volatility	20,396	0.1629	0.3099	0.0229	0.0573	0.1602
Loss	20,396	0.3435	0.4749	0.0000	0.0000	1.0000
Class action litigation risk	20,396	0.4077	0.3395	0.1038	0.2928	0.7146

This table shows the descriptive statistics. All continuous variables are winsorized at the 1st and 99th percentiles.

Table 2
Pearson Correlations
MandatoryElectronicFiling Information Asymmetry

	Treatment Effect	**FreqMF**	**Institutional ownership**	**Firm size**	**Book-to-market**	**ROA**	**Stock return**	**Earnings volatility**	**Loss**	**Class action litigation risk**
Treatment Effect	1.00	**0.04**	**0.15**	**0.17**	**-0.22**	**0.14**	**0.03**	**-0.04**	**-0.12**	**-0.26**
FreqMF	**0.04**	1.00	**0.47**	**0.46**	**-0.14**	**0.23**	0.01	**-0.13**	**-0.25**	**0.05**
Institutional ownership	**0.15**	**0.47**	1.00	**0.69**	**-0.16**	**0.28**	**-0.12**	**-0.22**	**-0.23**	0.01
Firm size	**0.17**	**0.46**	**0.69**	1.00	**-0.33**	**0.33**	**-0.02**	**-0.24**	**-0.35**	**0.02**
Book-to-market	**-0.22**	**-0.14**	**-0.16**	**-0.33**	1.00	**0.06**	**-0.13**	**-0.14**	**0.08**	**-0.05**
ROA	**0.14**	**0.23**	**0.28**	**0.33**	**0.06**	1.00	**0.19**	**-0.56**	**-0.60**	**-0.29**
Stock return	**0.03**	0.01	**-0.12**	**-0.02**	**-0.13**	**0.19**	1.00	**-0.03**	**-0.17**	**-0.05**
Earnings volatility	**-0.04**	**-0.13**	**-0.22**	**-0.24**	**-0.14**	**-0.56**	**-0.03**	1.00	**0.38**	**0.29**
Loss	**-0.12**	**-0.25**	**-0.23**	**-0.35**	**0.08**	**-0.60**	**-0.17**	**0.38**	1.00	**0.34**
Class action litigation risk	**-0.26**	**0.05**	0.01	**0.02**	**-0.05**	**-0.29**	**-0.05**	**0.29**	**0.34**	1.00

This table shows the Pearson correlations for the sample. Correlations that are significant at the 0.05 level or better are highlighted in bold.

Table 3

The Impact of Mandatory Electronic Filing on Management Forecast Frequency

	(1)	(2)
Treatment Effect	0.0799*** (6.35)	-0.0764*** (6.66)
Institutional ownership		0.9131*** (34.33)
Firm size		0.0884*** (20.39)
Book-to-market		-0.0182** (2.33)
ROA		0.1529*** (7.29)
Stock return		0.0430*** (4.52)
Earnings volatility		0.0958*** (5.15)
Loss		-0.2173*** (15.68)
Class action litigation risk		0.2014*** (11.71)
N	20,396	20,396
R^2	0.0019	0.2785

Notes: t-statistics in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively.