# The Effect of Modern Information Technologies on Firm Valuation

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#### Abstract

We find that firm value increases following the mandatory adoption of the SEC's EDGAR system. Our parallel trend analysis indicates that this effect does not hold prior to EDGAR adoption. The underlying mechanism is improved governance post-EDGAR adoption. The positive impact of EDGAR on firm value is more pronounced for firms with severe ex-ante agency problems (e.g., over-investing firms). This effect is also stronger for firms with higher institutional ownership and greater analyst coverage, suggesting that EDGAR's governance effect complements existing external governance forces. The enhanced firm value post-EDGAR adoption is mainly driven by late-phase adopters guided by the SEC's revised adoption rule, while early-phase adopters witness a decrease in firm value, indicating that the SEC's amendment of the existing rule plays a constructive role. Overall, our results suggest that modern information technologies strengthen external oversight, leading to higher investor confidence and firm valuation.

Keywords: Information disclosure; Firm valuation; Corporate Governance

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#### 1. Introduction

The digital transformation of financial information disclosure has revolutionized the way investors access and interpret corporate data. The EDGAR system (Electronic Data Gathering, Analysis, and Retrieval), implemented by the SEC from 1993 to 1996, is a pivotal development in this transformation. By mandating electronic filings, EDGAR significantly enhanced the accessibility and timeliness of corporate disclosures, thereby facilitating more informed investment decisions and improving market efficiency (Gao and Huang, 2020; Goldstein et al., 2023; Gomez, 2024). Understanding the impact of EDGAR on firm valuation is crucial for assessing how technological advancements in information disclosure influence corporate finance and investment behaviors.

Despite the widespread adoption of EDGAR, whether and how this system affects firm valuation (e.g., Tobin's Q) is ex ante an unclear and underexplored question. While some studies suggest that enhanced disclosure mechanisms can lead to more accurate firm valuations by reducing information asymmetry, others highlight potential adverse effects such as increased competitive pressures and managerial constraints.

On one hand, the implementation of EDGAR may increase firm value for several reasons. Firstly, EDGAR adoption may enhance firms' valuation by improving corporate governance. This is because investors' increased ability to monitor managerial actions (Goldstein et al., 2023) reduces managerial misbehaviors (e.g., information hoarding in Ni et al., 2021), thereby increasing firm value. Secondly, EDGAR significantly reduces information asymmetry by making financial disclosures more accessible and transparent for investors (Gao and Huang, 2020; Gomez, 2024). This reduction in information asymmetry lowers the cost of equity, making it less expensive for firms to raise capital (Lai et al., 2024) and thereby enhancing firm valuation. Thirdly, EDGAR adoption may enhance firms' valuation through improved investment decisions, such as better capital allocation efficiency

(Liu and Zhang, 2024) and attracting knowledgeable investors who focus on innovative projects (Kim and Valentine, 2023; Chang et al., 2024). Finally, EDGAR improves market feedback mechanisms and analyst behavior (Bird, Karolyi et al., 2021; Chang et al., 2023), leading to more accurate and efficient market valuations. This improved oversight and information dissemination contribute to higher firm value by building investor trust and reducing mispricing.

On the other hand, the implementation of EDGAR may also exert negative influences on firm value for several reasons. Firstly, increased transparency can intensify competitive pressures by requiring firms to disclose sensitive financial and strategic information that competitors can leverage (Gao and Huang, 2020). This heightened competition may suppress corporate innovation, leading to reduced R&D investments and slower growth (Dambra et al., 2024). Secondly, mandatory disclosure requirements can constrain managerial flexibility, limiting the ability to undertake long-term strategic investments without immediate market scrutiny (Chang et al., 2023). Additionally, the enhanced transparency may lead to risk aversion among managers, who might focus on short-term financial performance over innovative, high-risk projects to maintain favorable market valuations (Liu and Zhang, 2024; Bird et al., 2021). These contrasting effects indicate that the overall impact of EDGAR implementation on firm valuation is not yet clear, requiring further empirical investigation.

In this paper, we use the staggered implementation of EDGAR from 1993 to 1996 as an exogenous shock to study the impact of the digital transformation of information disclosure on firms' value, proxied by Tobin's Q. The random assignment of groups and the staggered implementation timeline of EDGAR create an ideal framework for causal inference, as they help mitigate the impact of other contemporaneous events that could potentially influence firms' Tobin's Q, thereby enhancing the robustness of our findings.

Our empirical analysis reveals a significant positive relationship between EDGAR

implementation and Tobin's Q. After controlling for firm fixed effects, Year\*Quarter fixed effects, and a series of firm characteristics that may influence Tobin's Q, we employ a staggered difference-in-differences approach and find that the implementation of EDGAR significantly increases Tobin's Q by 0.085, and this result is statistically significant at the 1% level. This finding highlights the effectiveness of EDGAR in enhancing the transparency and accessibility of financial information, which in turn promotes greater investor confidence and more accurate firm valuations. This suggests that the implementation of the EDGAR system enables investors to better understand firms' operating conditions and monitor them more effectively, thereby boosting investor confidence in the firms' future performance. To mitigate potential endogeneity concerns arising from selection bias and unobserved heterogeneity, First, we conduct a parallel trend test and find that there are no differential trends between the treatment firms and control firms before the EDGAR implementation. We find the significant positive effect of EDGAR on firms' Tobin's Q only shows up in and after the implementation period.

Second, we employ entropy balancing—a robust weighting methodology that reweights the control group to achieve covariate balance with the treated group. Diagnostic tests indicate that they display no observable differences in the first and the second moment. We find that, relative to the control group, firms experience a significant increase in Tobin's Q after the implementation of EDGAR system.

Next, we further explore the cross-sectional variation in our main results. First, we investigate whether corporate governance is the mechanism that facilitates the effect of EDGAR implementation on Tobin's Q. We find that the above effects are more pronounced among overinvested firms and large firms. This result suggests that these firms tend to better utilize the improved disclosure mechanisms brought by EDGAR implementation to reduce governance risk and alleviate market concerns about their investment decisions, thereby

increasing their firm valuation, and thus the positive effect of EDGAR implementation is more pronounced among firms with weaker governance.

Second, we examine whether the relation between EDGAR implementation and Tobin's Q is affected by the level of firms' external monitoring. We find that the effect of EDGAR implementation on Tobin's Q is stronger for firms with higher levels of institutional ownership. Additionally, the effect is more pronounced for firms with greater analyst coverage. These findings suggest that the implementation of EDGAR improves the quality of corporate disclosures, and external monitors-such as institutional investors and financial analysts-can benefit from the improved information to strengthen their governance over management. Consequently, investor confidence in the company's future performance increases, leading to a rise in Tobin's Q.

The interaction results with institutional ownership and analyst coverage help distinguish between two possible underlying mechanisms: (1) If the mechanism is via EDGAR adoption's governance effect, the impact of EDGAR on Tobin's Q should be stronger for firms with higher institutional ownership (IO) or analyst coverage because investors and analysts may rely on EDGAR to obtain information to exert their governance role (Gibbons et al. 2021). This governance-related hypothesis is supported by our analysis. (2) If the mechanism is via EDGAR adoption's effect on lowering the cost of capital, the impact of EDGAR on Tobin's Q should be weaker for firms with higher IO or analyst coverage (Lai, Lin, and Ma, 2024).

We also conduct an additional test to exploit the SEC's 1994 regulatory pause to test whether government learns from market and the efficacy of its rule on firm value. There is a one-year structural break in the implementation of EDGAR adoption in year 1994 after a subset of firms (i.e., early-phrase firms) had implemented EDGAR adoption in 1993. SEC sought for comments for its implementation policy and issued revised EDGAR rule for the rest firms that are scheduled to implement EDGAR since 1995 (i.e., late-phrase firms). Interestingly, we find that early-phase firms experienced significant reduction in valuation following the adoption, while later-phase firms experience large improve in firm valuation. The switching effects of EDGAR implementation on Tobin's Q across early and later phase-in groups indicates that SEC's amendment of the existing rule plays a constructive role in capital market. Next, we categorize the sample into Group CF-01 to CF-04 and Group CF-05 to CF-10 based on the SEC's 1994 regulatory pause and examine their interactions with firms' overinvestment and external monitoring. The analysis indicates that following the governance effect, which, in turn, leads to a significant positive impact on Tobin's Q. To ensure the robustness of our findings, we conduct several robustness checks, including additional fixed effects and alternative sample construction.

We contribute to the extant literature in the following ways. Firstly, our study adds to the literature on the economic implications of mandatory electronic disclosures. While existing studies document several important benefits to investors and firms from the EDGAR implementation (e.g., Gao and Huang, 2020; Chang et al., 2023; Lai et al., 2024), we are among the first to explore the nuanced effects of EDGAR on firm valuation. Our findings also complement the literature on the real effects of EDGAR by demonstrating how enhanced transparency facilitates more efficient capital allocation and builds investor confidence, leading to higher market valuations (Bird et al., 2021; Goldstein et al., 2023; Liu and Zhang, 2024).

The structure of this paper is as follows. Section 2 provides the literature review and background. Section 3 presents a detailed explanation of the empirical design. Section 4 analyses the empirical results, including an analysis of the main findings, parallel trend tests,

causality inference, cross-sectional variations, variation in EDGAR's effect on firm valuation, and robustness checks. Section 5 concludes.

#### 2. Institutional Background and Related Literature

Listed firms are required to provide their corporate fillings to SEC and these paper filings were deposited in The Securities and Exchange Commission (SEC)'s public reference rooms in Washington DC, New York City, and Chicago. Before the implementation of the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system by SEC, investors can only access firm disclosures by personal visiting SEC or via the subscription of commercial data vendor. This limited access made it difficult for investors have a clear and timely understanding of the company's financial situation as well as various significant change activities. Therefore, it was difficult for investors to find and analyse information about these firms.

In 1993, the SEC introduced the EDGAR system, which allows firms to submit electronic filings to make information more accessible to the public. Specifically, the SEC divided public firms into 10 groups and phased in EDGAR at different times. According to the phase-in schedule, the first group of firms were required to submit electronic filings began on April 26, 1993, and the last group started on May 6, 1996 (The detail of published phase-in schedule is tabulated in Appendix A).

The implementation of EDGAR system significantly reduces the cost of information acquisition for investors. It also allowed investors to access company disclosures more promptly and make better investment decisions based on this information. Furthermore, EDGAR enabled a large number of investors to simultaneously access disclosed information online, effectively addressing the limitation of paper-based documents, which could only be inspected by one individual at a time.

Prior literature on the impact of the phased implementation of EDGAR from 1993 to 1996 can be divided into two main perspectives: positive effects and negative effects. On the positive side, Goldstein et al. (2023) find that the implementation of EDGAR reduces the cost of equity and enhances firms' profitability, leading to increased investments. Liu and Zhang (2024) demonstrate that EDGAR improves firms' total factor productivity and investment efficiency. Gao and Huang (2020) discover a positive correlation between individual investors' net purchases of stocks after EDGAR's implementation and subsequent three-month CARs, as well as a significant increase in the number and forecast accuracy of sell-side analysts. EDGAR enhances information transparency and reduces the cost of information acquisition. As a result of heightened public and media scrutiny, CEO total compensation decreases (Babenko et al., 2024). Moreover, the number of new citations to the company's patents increases significantly, and a higher disclosure ratio among peer firms with similar technologies enhances the company's innovation efficiency (Chawla, 2023). Kim and Valentine (2023) utilize the phased implementation of EDGAR as a shock and find that high public firm presence has a significant positive effect on patent output in related industries or technological fields.

On the other hand, Gu et al. (2022) find that the increase in information transparency following EDGAR's implementation reduces managers' ability to learn from market prices, leading to fewer acquisitions and a decline in stock-based acquisitions, as firms lose the opportunity to use overvalued stock for mergers. Additionally, the disclosure requirements under EDGAR lead to a reduction in firms' innovation investment, while competitors' innovation investment increases, resulting in diminished economic returns for the firm due to information spillover effects (Dambra et al., 2024). Moreover, the company reduces the disclosure of patents, the quality of patent disclosures declines, and the company increases the retention duration of inventors to protect proprietary technological secrets (Chang et al.,

2024). Gomez (2024) notes that EDGAR exacerbates information asymmetry, particularly for firms with high information integration costs and low analyst coverage. While this benefits investors with strong information processing capabilities, it is detrimental to individual investors with weaker processing abilities. Bird et al. (2021) find that following EDGAR's implementation, the sensitivity of investment to Tobin's Q significantly decreases, indicating a decline in the informational value of market prices for managerial decision-making.

To investigate whether the phased implementation of EDGAR from 1993 to 1996 had a predominantly positive or negative impact, this paper examines the effect of EDGAR on firms' Tobin's Q. Tobin's Q is chosen as it reflects a firm's performance and investors' expectations of the firm's future profitability. Our regression results indicate that EDGAR's implementation significantly increases firms' Tobin's Q, consistent with research showing that net purchases after EDGAR lead to positive CARs over a subsequent period (Gao and Huang, 2020). This is also in line with findings suggesting that EDGAR improves market liquidity, reduces default risk, curbs managerial earnings manipulation, and enhances investment efficiency, ultimately lowering the cost of equity (Lai et al., 2024). Botosan (1997) finds that for U.S. manufacturing firms in 1990, higher levels of voluntary disclosure in annual reports are associated with lower equity costs, particularly for companies with low analyst coverage. Expanding on this, Botosan (2002) finds that annual report disclosure is negatively associated with the cost of equity, while timely disclosure is positively associated due to increased stock price volatility. Intellectual capital disclosure negatively affects the cost of equity, but the interaction between intellectual capital and financial disclosure has a significantly positive effect on the cost of equity (Mangena et al, 2016). After the implementation of Regulation Fair Disclosure, the reduction in information asymmetry led to a decrease in the cost of equity, as firms could no longer selectively disclose information (Chen et al., 2010). Similarly, a higher quality of management earnings forecast disclosure

policies in voluntary disclosure is associated with a lower cost of equity (Baginski and Rakow, 2012). Lambert et al. (2007) demonstrate that accounting information quality can reduce the cost of capital through both direct effects (assessing the covariance of cash flows with other firms) and indirect effects (influencing firms' actual decisions). However, low-quality disclosure results in cash flows being mispriced and undervalued, a phenomenon not observed in firms with high-quality disclosure. For firms with high-quality disclosure, investors are better able to identify the cash flow information in future earnings, reducing the mispricing of future cash flows (Drake et al., 2009).

Our paper fills the research gap concerning the impact of EDGAR's phased implementation from 1993 to 1996 on firms' Tobin's Q. Additionally, existing studies present conflicting conclusions regarding whether the effects of EDGAR's implementation are predominantly positive or negative, highlighting the need for further investigation into its comprehensive impact on firm value. By addressing this issue, our study provides empirical evidence on how heightened scrutiny and regulation, prompted by the digital transformation of information disclosure, affect firms' performance, either positively or negatively.

#### 3. Empirical design

#### 3.1. Data and sample selection

Following Gao and Huang (2020), we obtained the complete list of firms subject to the phased implementation of the EDGAR system from Appendix B of SEC Release No. 33-6977, issued on February 23, 1993. This table provides each firm's name, Central Index Key (CIK), and grouping information (ranging from CF-01 to CF-10). We matched these firms with the CRSP/Compustat merged database using CIK. Next, we excluded firms in the financial and utility industries. Finally, we retained quarterly observations from the second quarter of 1991 to the second quarter of 1998, covering two years before the first group's

implementation and two years after the last group's implementation. Our final sample contains 3,956 firms, and 80,969 firm-quarter observations.

#### 3.2. Variables, specification, and descriptive statistics

#### 3.2.1. Variables and specification

In this subsection, we employ a staggered difference-in-differences design to examine the effect of EDGAR implementation by comparing the changes in Tobin's Q among different groups of firms before and after the event. Due to the staggered implementation timeline across different firm groups, and the fact that all firms eventually receive treatment, firms in the sample serve as both treatment and control groups at different points in time. Firms that have not yet received treatment act as the control group when compared to those that began treatment earlier, while firms that have already received treatment serve as a control group compared to those scheduled for later treatment. This staggered implementation of the EDGAR system helps mitigate concerns about potential confounding factors affecting the study's results. Any omitted variables would need to influence Tobin's Q across different treatment groups according to the EDGAR implementation schedule to bias the results. Thus, factors unrelated to the EDGAR rollout are unlikely to affect the findings. Moreover, the EDGAR implementation plan, as an exogenous shock, alleviates concerns about reverse causality.

To formally test the impact of EDGAR implementation on firm value, we use a multivariate OLS regression model as follow:

$$TQ_{i,t+1} = \alpha_t + \beta_i + \gamma_1 EDGAR_{i,t} + Controls + \varepsilon_{i,t+1}.$$
(1)

where  $TQ_{i,t+1}$  is firm i's Tobin's Q in quarter t+1, defined as the book value of total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. The key variable of interest,  $EDGAR_{i,t}$ , is an indicator variable that equals 1 after the firm implements the EDGAR system and 0 otherwise. *Controls* is a vector of control variables for firm characteristics, including *Cashflow* (defined as net cash flow from operating activities scaled by lagged total asset), *Size* (defined as the natural logarithm of the book value of total assets), *Leverage* (defined as the ratio of long term debt to total assets), *ROA* (defined as operating income before depreciation and amortization divided by total assets), *Sales growth* (defined as the percentage increase or decrease in sales from the previous period to the current period), *Dividend* (defined as cash dividends scaled by total assets), *R&D* (defined as research and development expense scaled by sales), *CAPEX* (defined as capital expenditure scaled by sales). All variables are defined in Appendix B. We control for Year\*Quarter fixed effects ( $\alpha_t$ ) to absorb time-varying omitted variables specific to each calendar quarter.  $\beta_i$  denotes firm fixed effects,  $\varepsilon_{i,t+1}$  denotes the residual term. We estimate Equation (1) using OLS model. Standard errors are clustered at the firm level.

The coefficient of interest in our baseline regression is  $\gamma_1$ . It captures the impact of the EDGAR system implementation on firms' Tobin's Q. Given that the EDGAR system enables mandatory corporate disclosures to be filed electronically, significantly reduces the cost of obtaining information, strengthens external oversight, improves corporate governance, enhances the efficiency of corporate resource allocation, and is ultimately reflected in an increase in firm value (Tobin's Q), we expect this coefficient to be positive.

#### 3.2.2. Descriptive statistics

Table 1 presents summary statistics for the variables used in our baseline regression. The sample includes 80,969 firm-quarter observations from the second quarter of 1991 to the second quarter of 1998. To reduce the influence of outliers, all continuous variables are winsorized at the 1st and 99th percentiles. The mean value of TQ (t+1), our main dependent variable, is 1.933 with a standard deviation of 1.543, indicating a reasonable value in our sample. The mean value of the indicator variable *EDGAR* is 0.473, which indicates that the distribution of firm-quarterly observations in our sample is roughly equal before and after the adoption of the EDGAR system. Additionally, the distributions of the other firm characteristic variables are also reasonable.

#### < Insert Table 1 here >

#### 4. Empirical results

#### 4.1. Main results on Tobin's Q

In this section, we present the main results of our baseline regression, which examines the effect of EDGAR implementation on Tobin's Q. We estimate Equation (1) using a sample of 80,969 firm-quarter observations from 1991 to 1998 and report the results in Table 2. The dependent variable, *Tobin's Q*, is measured in the subsequent quarter, which allows us to observe the effect of EDGAR adoption on firm value with a time lag.

Column (1) in Table 2 reports the regression results with only the main independent variable, *EDGAR*, along with firm fixed effects and Year\*Quarter fixed effects. The coefficient on *EDGAR* is 0.089 and is statistically significant at the 1% level, which means that the adoption of the *EDGAR* system increases a firm's Tobin's Q by 0.089 units, approximately 4.6% relative to the sample mean of Tobin's Q. In Column (2), we control for a range of firm characteristic variables that may impact firm value. The coefficient on *EDGAR* remains positive and statistically significant (0.085, t = 4.04). The fact that the coefficient on *EDGAR* remains almost unchanged after accounting for additional firm characteristics, suggesting that becoming an EDGAR filer significantly improves the firm's Tobin's Q. And the results in Column (2) of Table 2 also indicate that the control variables are

all statistically significant, and their relationships with Tobin's Q are consistent with findings from prior research.

#### < Insert Table 2 here >

#### 4.2. Parallel trends

An essential premise of the difference-in-differences estimation is the parallel trends assumption, which states that in the absence of the event shock, the treatment and control groups would follow similar trends over time. To test this assumption, we replace the independent variable *EDGAR* in the baseline regression with several time indicator variables corresponding to periods before and after the implementation of EDGAR system. In addition, we restrict the analysis to quarters starting from four quarters before a firm's actual EDGAR adoption quarter to the last quarter in the sample (i.e., second quarter in year 1996). We then re-estimate Equation (1). Specifically, the regression model is as follows:

$$\begin{split} TQ_{i,t+1} &= \alpha_t + \beta_i + \gamma_1 EDGARm3_{i,t+1} + \gamma_2 EDGARm2_{i,t+1} + \gamma_3 EDGARm1_{i,t+1} + \\ \gamma_4 EDGAR0_{i,t+1} + \gamma_5 EDGARp1_{i,t+1} + \gamma_6 EDGARp2_{i,t+1} + \gamma_7 EDGARp3_{i,t+1} + \\ \gamma_8 EDGARp4 +_{i,t+1} + Controls + \varepsilon_{i,t+1}. \end{split}$$

where *EDGARm3*, *EDGARm2*, *EDGARm1*, *EDGAR0*, *EDGARp1*, *EDGARp2*, *EDGARp3* and *EDGARp4*+ are indicator variables capturing the timing of EDGAR adoption relative to the current quarter. Specifically, *EDGARm3*, *EDGARm2*, and *EDGARm1* are set to 1 for quarters that are four, three, two, and one quarter(s) before the firm's EDGAR adoption quarter respectively, and 0 otherwise. *EDGAR0* equals 1 in the quarter of EDGAR adoption and 0 otherwise. *EDGARp1*, *EDGARp2*, and *EDGARp3* equal 1 for quarters that are one, two, and three quarters after the firm's EDGAR adoption quarter respectively, and 0 otherwise. The estimation also includes the same control variables as

<sup>(2)</sup> 

in baseline model, firm fixed effects, and Year\*Quarter fixed effects. Standard errors are clustered at the firm level.

The regression results are presented in Table 3, there is no significant difference in Tobin's Q levels between the treatment and control groups prior to the implementation of EDGAR, confirming the parallel trends assumption. The coefficients for *EDGARp1* (0.092, t = 3.14), *EDGARp2* (0.106, t = 3.20), *EDGARp3* (0.124, t = 3.32), and EDGARp4+ (0.079, t = 1.84) are all positive and statistically significant. These findings indicate that the impact of EDGAR on Tobin's Q is not transitory but persists for at least four quarters following the event shock. This suggests that the benefits brought by EDGAR implementation are sustained over time. We also plot the dynamic effects of EDGAR implementation on Tobin's Q levels are illustrated in Figure 1. The conclusion is qualitatively similar.

< Insert Figure 1here > < Insert Table 3 here >

### 4.3. Causality Inference - Entropy Balancing Analysis

In this subsection, we employ the entropy balancing technique to ensure the robustness of our results and mitigate potential endogeneity issues arising from imbalances between the treatment and control groups. This method adjusts the weights of the observations in the control group to match the distribution of covariates in the treatment group, thus reducing bias in the estimated treatment effects. Specifically, we apply entropy balancing to the key firm characteristics that may affect the outcome variable, such as firm size, leverage, ROA, cash flow, sales growth, dividends, research and development (R&D) expenditures, and capital expenditures.

Following the reweighting process, we re-estimate Equation (1) using the adjusted weights. In Table 4, we find that the coefficient on EDGAR remains statistically significant

(0.070, t = 4.05) and positive, consistent with our baseline findings. This suggests that the EDGAR adoption continues to have a positive and significant effect on the firm's Tobin's Q, even after addressing potential imbalances in the covariate distributions between the treatment and control groups. This method reinforces the validity of our conclusions and strengthens our confidence that the observed treatment effects are not driven by confounding factors related to differences in firm characteristics between the groups.

#### < Insert Table 4 here >

#### 4.4. Cross-sectional variations

#### 4.4.1. Interaction Analysis – Impact of Corporate Governance

In the previous section, we have confirmed the positive the effect of EDGAR on firm value. In this section, we will explore whether the impact of EDGAR adoption on Tobin's Q varies based on two important corporate governance factors: overinvestment and firm size. Modern information technologies have significantly improved the accessibility of information, increased transparency, and reduced the cost for investors to obtain information. As a result, once a firm becomes an EDGAR filer, stakeholders can access and analyse its information at a lower cost, allowing them to monitor the firm's management and reduce managerial overinvestment (Goldstein, Yang, and Zuo, 2023). Overinvestment is typically associated with weak corporate governance, as it reflects suboptimal resource allocation, often driven by managerial agency problems or excessive capital availability. Since managers' compensation is often tied to asset growth, they may actively push for the expansion of the company's size beyond its optimal scale, thus increasing the resources they control and benefiting from them (Jensen, 1986). Based on our hypothesis, we predict that the impact of EDGAR implementation on Tobin's Q will be more pronounced for companies with overinvestment.

Size, on the other hand, represents a critical dimension of corporate governance. Agency theory suggests that large firms have higher agency costs, and to address this issue, they are more motivated to disclose more information compared to smaller firms (Meek et al., 1995). This helps reduce shareholder concerns about management and can also lower litigation risks. Therefore, we expect that larger firms will focus more on enhancing information disclosure and corporate governance after the implementation of EDGAR, thereby amplifying the positive impact of EDGAR on Tobin's Q.

To measure overinvestment, we follow the methodology of Biddle et al. (2009) to estimate a regression where asset growth is regressed on sales growth. Specifically, we use the following equation:

$$Assetgrowth_{i,t+1} = \alpha + \beta Salesgrowth_{i,t} + \varepsilon_{i,t+1}.$$
(3)

We use annual data from the year prior to the implementation of EDGAR and estimate Equation (3) based on industry-year, ensuring that each year has at least 20 industry observations. The residuals ( $\varepsilon_{i,t+1}$ ) from this regression capture deviations from expected investment behaviour. These deviations are then used to group firms, with firms in the highest residual quartile defined as *OVERINV*.

To analyse the interaction between EDGAR implementation and corporate governance, we modify our baseline regression by introducing the interaction term between EDGAR and the variables measuring corporate governance. The regression model is specified as follows:

 $TQ_{i,t+1} = \alpha_t + \beta_i + \gamma_1 EDGAR_{i,t} + \gamma_2 (EDGAR_{i,t} * Corporate Governance_{i,t}) + Controls + \varepsilon_{i,t+1}.$ 

(4)

where *Corporate Governance* is measured using *OVERINV* and *Size*. *OVERINV* is a dummy variable equal to 1 if a firm is classified as over-investing and 0 otherwise. *Size* is the natural logarithm of the book value of total assets. The coefficient on the interaction term, captures the differential effect of EDGAR implementation for over-investing firms or large firms

compared to other firms. The results are presented in Table 5. In Column (1), we find that the coefficient on the interaction term (EDGAR\*OVERINV) is 0.261 and statistically significant at the 1% level, indicating that the effect of EDGAR implementation on Tobin's Q is stronger for firms classified as over-investing. In Column (2), we find that the coefficient on the interaction term (EDGAR\*Size) is 0.031 and statistically significant at the 1% level, indicating that the effect of EDGAR implementation on Tobin's Q is stronger for larger firms.

This result supports our prediction that EDGAR improves corporate governance, and mitigates agency problems, potentially curbing managers' overinvestment and reallocating resources to more productive uses, thereby increasing firm value. Particularly for firms with more pronounced governance issues, the benefits of EDGAR implementation are more substantial.

The interaction results help distinguish between two possible underlying mechanisms: (1) If the mechanism is via EDGAR adoption's governance effect, the impact of EDGAR on Tobin's Q should be stronger for over-investing and larger firms because they capture misuse of corporate resources. (2) If the mechanism is via EDGAR adoption's effect on lowering the cost of capital, the impact of EDGAR on Tobin's Q should be weaker for over-investing and larger firms (alternatively, stronger for under-investing and smaller firms). This is because under-investing and smaller firms may benefit the most from the reduced cost of capital following EDGAR adoption. Our empirical results of the interaction effects support the governance-related hypothesis.

#### 4.4.2. Interaction Analysis – Impact of External Monitoring

Institutional investors play an essential role in corporate governance by actively monitoring managerial behaviour and improving decision-making processes (Aggarwal et al., 2011; Fich et al., 2015; McCahery et al., 2016; Lewellen and Lewellen, 2022). In particular, long-term and dedicated investors possess both the expertise and the incentives to analyse financial disclosures and influence managerial decisions (Borochin and Yang, 2017). By enhancing the accessibility of corporate filings, EDGAR significantly reduces information acquisition costs and provides institutional investors with timely and accurate firm-specific information. This allows institutional investors to identify governance issues more effectively and demand corrective actions, thereby strengthening their ability to monitor and influence management. As a result, firms with higher institutional ownership are more likely to experience substantial improvements in governance following EDGAR implementation, leading to an increase in firm value as measured by Tobin's Q.

Similarly, financial analysts, as external monitors and information intermediaries, also play a crucial role in reviewing managerial actions and corporate governance. Analysts spread firm-specific information through their research and reports, which help mitigate agency problems, discourage value-destroying acquisitions, reduce earnings management and excessive CEO compensation (Chen et al., 2015; Kim et al., 2019; Yu, 2008). Moreover, analysts help reduce information asymmetry, lower the cost of capital, and facilitate corporate investment and financing decisions (Derrien and Kecskés, 2013). With the implementation of EDGAR, information transparency improves significantly, allowing analysts to access corporate financial data more easily and promptly. Gibbons et al. (2021) find that 24% of analyst forecast updates rely on EDGAR, with analysts, on average, viewing eight filings. EDGAR enables analysts to make timelier and more accurate forecasts, thereby enhancing their monitoring efficiency and helping investors better evaluate firm performance and identify managerial issues. Consequently, similar to institutional investors, analyst coverage can amplify the effects of EDGAR through its information oversight function, improving firm value. To test our hypothesis, in this subsection, we introduce interaction terms between EDGAR and institutional ownership as well as analyst coverage into the baseline regression model. These interaction terms allow us to examine whether institutional investor participation and analyst coverage enhance the positive effects of EDGAR on Tobin's Q. The specific models are as follow:

$$TQ_{i,t+1} = \alpha_t + \beta_i + \gamma_1 EDGAR_{i,t} + \gamma_2 (EDGAR_{i,t} * IO_{i,t}) + \gamma_3 IO_{i,t} + Controls + \varepsilon_{i,t+1}.$$
(5)

$$TQ_{i,t+1} = \alpha_t + \beta_i + \gamma_1 EDGAR_{i,t} + \gamma_2 (EDGAR_{i,t} * Analyst Coverage_{i,t}) + \gamma_3 Analyst Coverage_{i,t} + Controls + \varepsilon_{i,t+1}.$$
(6)

In Equation (5), *IO* is defined as the proportion of a firm's shares held by institutional investors in a quarter, scaled by shares outstanding. The interaction term, *EDGAR\*IO*, captures the differential effect of EDGAR implementation for firms with varying levels of institutional ownership. The regression results are shown in Table 6 Panel A. There is a significant positive interaction between EDGAR and institutional investor ownership. Specifically, the coefficient of *EDGAR\*IO* is 0.338 (t = 4.59) and statistically significant at the 1% level, indicating that firms with higher institutional ownership experience greater improvements in Tobin's Q following the adoption of EDGAR. This result aligns with the argument that institutional investors act as motivated monitors and may amplify the effects of the EDGAR system.<sup>1</sup>

In Equation (6), *ANACOV* is the natural logarithm of 1 plus the number of analysts following the company each quarter. The interaction term, *EDGAR\*ANACOV*, captures the differential effect of EDGAR implementation for firms with varying levels of analyst coverage. The results in Table 6 Panel B show that the interaction term *EDGAR\*ANACOV* is

<sup>&</sup>lt;sup>1</sup> In Column 2 of Panel A in Table 6 we find that the interaction effect with IO is mainly driven by ownership by dedicated and transient institutional investors. This result is consistent with the view that both dedicated investors and transient institutional investors monitor firms (the former group typically actively engage in corporate governance, while the latter group monitor firms via their threat to exit, i.e., sell, underperforming firms).

positive and significant, with a coefficient of 0.061 (t = 3.56). This indicates that firms with greater analyst coverage benefit more from the implementation of EDGAR, as analysts can leverage improved access to company filings to enhance their monitoring and forecasting activities.

The interaction results with institutional ownership and analyst coverage help distinguish between two possible underlying mechanisms: (1) If the mechanism is via EDGAR adoption's governance effect, the impact of EDGAR on Tobin's Q should be stronger for firms with higher institutional ownership (IO) or analyst coverage because investors and analysts may rely on EDGAR to obtain information to exert their governance role (Gibbons et al. 2021). (2) If the mechanism is via EDGAR adoption's effect on lowering the cost of capital, the impact of EDGAR on Tobin's Q should be weaker for firms with higher IO or analyst coverage. This is because EDGAR's impact on the cost of capital is weaker for firms with higher IO or analyst coverage (Lai, Lin, and Ma, 2024). Our empirical results of the interaction effects in Table 6 support the governance-related hypothesis.

Overall, these findings support our prediction that external monitoring mechanisms serve as complementary forces amplifying the governance-enhancing effects of EDGAR. By reducing the cost of information acquisition, EDGAR strengthens external oversight from institutional investors and analysts, promoting improvements in corporate governance, which ultimately lead to higher Tobin's Q.

# < Insert Table 6 here >

# 4.5. Time-series Variation in EDGAR's Effect on Firm Valuation

# 4.5.1. The Impact of the SEC's EDGAR Amendment of Rules

In this section, we conduct an additional test to examine whether the effect of EDGAR implementation on firm valuation evolved over time. We leverage the SEC's 1994 regulatory

pause—a strategic halt to evaluate EDGAR's efficacy—as a natural experiment to assess temporal shifts in EDGAR's valuation effects (see Appendix C for the details of amendments of rules during the 1994 regulatory pause). This discontinuity in the rollout timeline enables us to compare differential market responses to EDGAR adoption between early cohorts (CF 01–04; implemented pre-pause) and post-reassessment cohorts (CF 05–On; rolled out post-1995).

The results in Table 7 Panel A demonstrate divergent effects of EDGAR implementation on Tobin's Q across staggered phase-in groups. In Column (1), firms in the initial four cohorts (CF 01–04) exhibit statistically negative valuation impacts, whereas later cohorts (CF 05–On, in Column (2)) show positive effects. Given the stability of coefficients for control variables, this reversal likely reflects temporal shifts in market assimilation of EDGAR's disclosure regime rather than macroeconomic or industry-specific valuation trends.

In untabulated tests, we find that early-phase firms differ systematically from later entrants: they are characterized by larger size, higher profitability, and greater leverage, but lower sales growth, reduced R&D intensity, and elevated dividend payouts. These attributes suggest early-phase firms may operate in mature industries with limited growth prospects, where marginal gains from enhanced transparency were outweighed by heightened regulatory scrutiny. Such scrutiny may have eroded information monopolies or exposed operational inefficiencies. amplifying negative market perceptions. Conversely, later-phase firms-marked by stronger sales growth, greater R&D commitment, and lower dividend ratios— may rely more heavily on external financing and are thus disproportionately sensitive to reductions in information asymmetry. EDGAR's transparency improvements enabled investors to more accurately price these firms' growth potential, driving positive Tobin's Q effects. These results align with Gomez (2024), who attributes early-stage mispricing to EDGAR's transient amplification of information disparities, and with Goldstein et al. (2023), who emphasize EDGAR's long-term role in optimizing capital allocation.

Collectively, our findings indicate that the initial adverse market reaction stemmed not merely from learning dynamics but also from heterogeneous firm fundamentals, with later-phase firms' growth-oriented profiles allowing them to capitalize more effectively on EDGAR's disclosure infrastructure.

#### 4.5.2. Matching firms based on industry and size

To better identify the causal effect of EDGAR adoption on Tobin's Q for late-phase adopters, we employ a difference-in-differences (DiD) approach, enhanced by matching firms based on industry and *SIZE*. Our treatment sample comprises firms from Groups CF-05 through CF-10, which adopted the EDGAR system between 1995 and 1996, transitioning from a non-EDGAR to an EDGAR reporting regime. Our control sample includes firms from Groups CF-01 through CF-04, which had already adopted EDGAR prior to our sample period and thus experienced no change in disclosure status during the event windows analysed. Our empirical goal is to distinguish whether the observed increase in Tobin's Q following EDGAR adoption among the treatment firms genuinely results from EDGAR adoption itself or merely reflects broader economic conditions or concurrent macroeconomic shocks.

We first require that control firms and treated firms belong to the same industry. Then, we select control firms whose *SIZE* is closest to that of the treated firms in the quarter immediately before the treated firms transition from non-EDGAR to EDGAR filers. Based on this criterion, for each quarter, when a group of treatment firms switches to the EDGAR reporting regime, we create a cohort ( $\theta_g$ ) of treatment and control firms. After matching, we construct an event window spanning four quarters before and after each treatment firm's EDGAR adoption quarter ([-4,+4]), including the event quarter itself. To isolate the incremental effect of EDGAR adoption and precisely control for macroeconomic conditions, we define the post-EDGAR indicator (Post) dynamically: for each matched treatment-control pair, the control firm's Post indicator exactly mirrors that of the matched treatment firm. Specifically, if a treatment firm's EDGAR indicator equals zero (one) in a given quarter, the matched control firm's EDGAR indicator also equals zero (one), thereby ensuring identical temporal alignment within matched pairs. This approach enables us to effectively control for concurrent macroeconomic trends and isolate EDGAR's incremental impact on Tobin's Q.

Finally, we estimate the following DiD regression model using the matched sample:  $TQ_{i,t+1} = \alpha_t + \beta_i + \theta_g + \gamma_1 TREAT_i * POST_{i,t} + \gamma_2 TREAT_i + \gamma_3 POST_{i,t} + Controls + \varepsilon_{i,t+1}$ . (7) where  $TQ_{i,t+1}$  is firm i's Tobin's Q in quarter t+1,  $TREAT_i$  equals 1 for the treatment firms (firms in CF-05- CF-10),  $POST_{i,t}$  is defined as mentioned above.  $\alpha_t$ ,  $\beta_t$ , and  $\theta_g$  denotes Frm, Year\*Quarter, and Cohort fixed effects, respectively. Our primary coefficient of interest is  $\gamma_3$ , capturing the incremental effect of EDGAR adoption on firm valuation. The results are presented in Panel B of Table 7. Across all three regression specifications, the coefficient of the interaction term is statistically significant and positive, supporting our hypothesis. This confirms that the previously observed effects are indeed driven by the adoption of EDGAR itself rather than other confounding factors. Notably, in Column (3), the variable treat is omitted because the regression includes firm fixed effects, which absorb any time-invariant firm-level characteristics (including the treatment assignment for firms that never switch status).

To enhance comparability between treatment and control firms, we apply propensity score matching (PSM) method using two strategies. First, control firms for Groups CF-05 to CF-10 are drawn from Groups CF-01 to CF-04. Second, control firms must not have changed their filing method in the two quarters before and after the treatment firm's EDGAR adoption quarter. Our results remain consistent (See Appendix D for the regression results).

< Insert Table 7 here >

#### 4.5.3. Interaction tests for early-phase and late-phase subsamples

From April 1993, when the first group of companies was mandated to file electronically via EDGAR, to the six-month test period in 1994, SEC staff gained valuable insights and identified areas where technical and regulatory enhancements to the EDGAR system were needed. In July 1994, the Commission proposed amendments to the EDGAR rules and invited public comments. It received seven comment letters, with most commenters expressing support for the proposed changes. As a result, the Commission adopted the majority of the revisions and made further adjustments based on the feedback received (see Appendix C for the details of amendments of rules during the 1994 regulatory pause). In the previous section, we have conducted regressions by dividing the sample based on the SEC's 1994 regulatory pause, separating firms into Group CF-01 to CF-04 and Group CF-05 to CF-10. Our findings indicate that the first four groups had a significant negative impact on Tobin's Q, while the latter six groups had a significant positive impact. Building on this, we interact this subsample classification with firms' overinvestment and external monitoring to further explore their effects.

Table 8 presents the results of this analysis; it is clear that these interaction effects are more pronounced in the late-phase subsample. For the early-stage subsample (Columns (1)-(3)), none of the interaction terms show a significant positive effect, whereas in contrast, for the late-stage subsample (Columns (4)-(6)), the interaction effects show significance: firms with high overinvestment (*EDGAR\*OVERINV*) show a significant positive effect on Tobin's Q (0.388, t = 5.72), institutional ownership (*EDGAR\*IO*) also enhances the positive effect of EDGAR adoption (0. 472, t = 4.2), and analyst coverage (*EDGAR\*ANACOV*) becomes statistically significant following the adoption of EDGAR (0.121, t = 3.66).

These findings indicate that the amendments of government to disclosure rules played a

crucial role in shaping the economic consequences of EDGAR implementation. The significant and positive results in the late-phase subsample affirm the effectiveness of the government's amendments, reinforcing their role in increasing investor confidence by enhancing external oversight and, as a result, firm valuation.

< Insert Table 8 here >

#### 4.6. Robustness checks

To ensure the robustness of our findings, we conduct two additional tests. First, to address the issue of omitted variables associated with unobservable heterogeneity at different levels, we include additional fixed effects in our analysis. Second, we re-estimate our baseline regression while excluding firms in Group CF-01 and CF-10 to address potential biases associated with early voluntary adopters and small firms that received extended compliance periods.

Panel A of Table 9 presents result from regressions incorporating additional fixed effects. In Column (1), we include state fixed effects, with data sourced from Bai, Fairhurst, and Serfling (2020), which provides state-level data on historical headquarters' location, to account for persistent state-level differences in firm headquarters' locations that could influence Tobin's Q. The coefficient on EDGAR remains positive and statistically significant (0.059, t = 2.72), consistent with our baseline results. Column (2) replaces year-quarter fixed effects with separate year and quarter fixed effects, allowing for a more flexible control of macroeconomic conditions that may vary independently across years and quarters. The coefficient on EDGAR remains significant (0.068, t = 3.34), reinforcing our main findings. In Column (3), we introduce industry-by-year-by-quarter fixed effects using one-digit SIC industry codes from the CRSP/Compustat merged database to control for time-varying industry heterogeneity that may impact firm value. The coefficient on EDGAR remains

positive and statistically significant (0.077, t = 3.63). Following the approach of Dambra et al. (2024), in Column (4), we classify firms into eight cohorts based on whether their assigned EDGAR implementation date falls within the same quarter of the same year. We then run a regression using only cohort fixed effects to control for all common shocks within each implementation cohort. The coefficient on EDGAR still positive and statistically significant (0.119, t = 5.72).

Panel B of Table 9 examines whether the phased implementation of EDGAR affects firms' Tobin's Q across different regression samples. Column (1) estimates the regression using a sample that excludes the first and last implementation groups. Group CF-01 comprises transitional filers who voluntarily adopted electronic filing before EDGAR's phased mandatory implementation. To eliminate potential bias from these early voluntary adopters, we exclude Group CF-01 from our analysis (SEC Release No. 33-6977 (1993)). Similarly, the SEC placed small companies in Group CF-10 to give them additional time to acquire the necessary equipment for electronic filing (Gao and Huang, 2020). To minimize the potential influence of these smaller firms, we also exclude Group CF-10 from our sample. Even after these exclusions, our results find that the implementation of EDGAR continues to have a positive impact on Tobin's Q. Following Goldstein et al. (2023), Column (2) applies a different filter, excluding firms with total assets below \$10 million in 1992, the year before EDGAR implementation. This sample enhances comparability across firms, mitigates the impact of extreme values, and ensures that our estimates are not biased by the distinctive characteristics of smaller firms. We find that the phased implementation of EDGAR remains positively and significantly associated with firms' Tobin's Q at the 1% level, with an estimated coefficient of 0.06 (t = 3.34). Column (3) uses a [-6, +6] quarter window centered on each group's respective EDGAR implementation date, restricting the sample to observations within this period. This helps prevent our regression results from being

influenced by the overall trend in Tobin's Q observed between 1991 and 1998. We find that, under this sample construction, the implementation of EDGAR remains highly significant and has a positive impact on firms' Tobin's Q.

< Insert Table 9 here >

### 5. Conclusion

We use staggered difference-in-differences to examine the impact of EDGAR, which was implemented in phases from 1993 to 1996, on companies' Tobin's Q. Our findings show that when companies are required to upload disclosure information to the EDGAR system promptly, their Tobin's Q increases significantly. The phased implementation of EDGAR serves as an excellent natural experiment, as it effectively mitigates the influence of other external factors that might also affect Tobin's Q during the same period. Moreover, the implementation of EDGAR has a more pronounced positive effect on companies with overinvestment, larger size, higher institutional ownership, especially from dedicated and transient investors, and greater analyst coverage.

Our results suggest that the implementation of EDGAR, by enhancing information transparency, reducing information acquisition costs, and improving the quality of corporate disclosures, allows investors, institutional investors, and analysts to better monitor and govern companies. This increased oversight boosts investor confidence in a company's future profitability, and as companies respond to greater regulatory scrutiny, they are motivated to improve their performance, leading to an increase in Tobin's Q. Moreover, companies with overinvestment and larger size are more likely to waste resources by investing in low-return projects. By disclosing information through the EDGAR system, these companies are subject to external oversight, which gives them a greater opportunity to improve their investment efficiency and, in turn, increase their Tobin's Q. Therefore, policymakers should further enhance the legal and regulatory framework regarding corporate disclosure transparency, promote improvements in the quality of disclosures, and encourage greater involvement of institutional investors and analysts in corporate governance. This would help improve the efficiency of capital allocation.

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#### Figure 1: Parallel Trends Test for Tobin's q Around EDGAR Implementation

This figure illustrates the parallel trends assumption for Tobin's Q in quarters surrounding the phased implementation of the EDGAR system. The x-axis represents the time relative to the implementation, with "0" indicating the quarter of EDGAR adoption. The y-axis shows the estimated changes in Tobin's Q, with confidence intervals plotted to assess statistical significance. The dots represent the point estimates, and the vertical lines indicate the 90% confidence intervals.



# Table 1: Summary Statistics

This table	reports	descriptive	statistics	for	the	variables	employed	in	our	baseline	regression.	То
reduce the	impact	of outliers, a	all continu	lous	var	iables are	winsorized	at	the	1st and 9	9th percenti	les.
All variable	les are de	efined in App	pendix B.									

	Ν	Mean	SD	p25	Median	p75
TQ (t+1)	80,969	1.933	1.543	1.089	1.444	2.148
EDGAR	80,969	0.473	0.499	0	0	1
SIZE	80,969	4.663	1.989	3.217	4.503	5.958
LEVERAGE	80,969	0.16	0.166	0.009	0.114	0.263
ROA	80,969	0.022	0.047	0	0.028	0.047
CASHFLOW	80,969	0.024	0.045	0	0.017	0.043
SALES GROWTH	80,969	0.07	0.372	-0.063	0.027	0.124
DIVIDEND	80,969	0.002	0.005	0	0	0.003
R&D	80,969	0.122	0.715	0	0	0.039
CAPEX	80,969	0.102	0.265	0.014	0.036	0.078

#### Table 2: Baseline result - The Impact of EDGAR Adoption on Firm Valuation

This table reports the baseline results. The dependent variable, TQ(t+1)), is the firm's Tobin's Q in quarter t+1. The main independent variable,  $EDGAR_t$ , is an indicator which equals 1 if a firm has adopted EDGAR system as of quarter t, and 0 otherwise. Control variables are lagged by one quarter. The regression includes firm fixed effects and Year\*Quarter fixed effects. Standard errors are clustered at the firm level. All other variables are defined as in Appendix B. The t-statistics are reported in parentheses, and significance levels of \*\*\*, \*\*, and \* represent 1%, 5%, and 10%, respectively.

	(1)	(2)
Dep. Var.=	TQ(t+1)	TQ(t+1)
EDGAR <sub>t</sub>	0.089***	0.085***
	(4.08)	(4.04)
$SIZE_t$		-0.430***
		(-12.14)
LEVERAGE <sub>t</sub>		-0.479***
		(-5.68)
$ROA_t$		2.383***
		(7.19)
CASHFLOW <sub>t</sub>		0.259***
		(2.65)
SALES GROWTH <sub>t</sub>		0.051***
		(3.26)
DIVIDENDt		8.034***
		(3.19)
$CAPEX_t$		0.186***
		(5.19)
$R\&D_t$		-0.073***
		(-3.28)
Constant	1.891***	3.883***
	(183.28)	(24.04)
Firm FEs	YES	YES
Year*Quarter FEs	YES	YES
Observations	80,969	80,969
Adjusted R-squared	0.669	0.682

#### Table 3: Causality Inference - Parallel Trends Analysis

This table presents the parallel trend test. We construct multiple dummy variables to indicate the quarter around firms' EDGAR adoption quarter (0). *EDGARm3*, *EDGARm2*, and *EDGARm1* are set to 1 if the dependent variable (Tobin's Q) is measured in quarters that are, three, two, and one quarter(s) before the firm's EDGAR adoption quarter respectively, and 0 otherwise. *EDGAR0* equals 1 if the dependent variable is measure in the quarter of EDGAR adoption and 0 otherwise. *EDGARp1*, *EDGARp2*, and *EDGARp3* equal 1 for quarters that are one, two, and three quarters after the firm's EDGAR adoption quarter respectively, and 0 otherwise. *EDGARp1*, *EDGARp2*, and *EDGARp3* equal 1 for quarters that are one, two, and three quarters that are four or more quarters after the firms' EDGAR adoption quarter, and 0 otherwise. We restrict our analysis to quarters from four quarters before a firm's actual EDGAR adoption quarter to the last quarter in the sample (1996). Firm and Year\*Quarter fixed effects are included, and standard errors are clustered at the firm level. All other variables are defined as in Appendix B. The t-statistics are reported in parentheses, and significance levels of \*\*\*, \*\*, and \* represent 1%, 5%, and 10%, respectively.

	(1)
Dep. Var.=	TQ(t+1)
EDGARm3	-0.018
	(-0.93)
EDGARm2	-0.013
	(-0.60)
EDGARm1	0.011
	(0.46)
EDGAR0	0.065**
	(2.33)
EDGARp1	0.092***
	(3.14)
EDGARp2	0.106***
	(3.20)
EDGARp3	0.124***
	(3.32)
EDGARp4+	0.079*
	(1.84)
$SIZE_t$	-0.431***
	(-12.18)
LEVERAGE <sub>t</sub>	-0.481***
	(-5.70)
$ROA_t$	2.386***
	(7.19)
$CASHFLOW_t$	0.260***
	(2.66)
SALES GROWTH <sub>t</sub>	0.051***
	(3.28)
DIVIDENDt	8.009***
	(3.18)
$CAPEX_t$	0.186***
	(5.20)

$R\&D_t$	-0.073***
	(-3.26)
Constant	3.886***
	(24.00)
Firm FEs	YES
Year*Quarter FEs	YES
Observations	80,969
Adjusted R-squared	0.682

#### **Table 4: Causality Inference - Entropy Balancing Analysis**

This table presents the results of the regression using the entropy balancing method to estimate the effect of EDGAR implementation on Tobin's Q. The dependent variable,  $TQ_{(t+1)}$ , is the firm's Tobin's Q in quarter t+1. The main independent variable,  $EDGAR_t$ , is an indicator which equals 1 if a firm has adopted EDGAR system as of quarter t, and 0 otherwise. The regression is performed by OLS. Firm and Year\*Quarter fixed effects are included, and standard errors are clustered at the firm level. All other variables are defined as in Appendix B. The t-statistics are reported in parentheses, and significance levels of \*\*\*, \*\*, and \* represent 1%, 5%, and 10%, respectively

	(1)	
Dep. Var.=	TQ(t+1)	
$EDGAR_t$	0.070***	
	(4.05)	
SIZEt	-0.358***	
	(-11.12)	
LEVERAGE <sub>t</sub>	-0.501***	
	(-6.46)	
$ROA_t$	3.141***	
	(10.59)	
CASHFLOW <sub>t</sub>	0.330***	
	(3.90)	
SALES GROWTH <sub>t</sub>	0.033**	
	(2.41)	
DIVIDENDt	8.406***	
	(3.79)	
$CAPEX_t$	0.178***	
	(5.55)	
$R\&D_t$	-0.049	
	(-1.59)	
Constant	3.669***	
	(22.05)	
Firm FEs	YES	
Year*Quarter FEs	YES	
Observations	80,969	
Adjusted R-squared	0.705	

#### Table 5: Interaction Analysis – Impact of Corporate Governance

This table presents the results of the interaction analysis between EDGAR adoption and proxies for governance on Tobin's Q. The dependent variable, TQ(t+1), is the firm's Tobin's Q in quarter t+1. The main independent variable,  $EDGAR_t$ , is an indicator which equals 1 if a firm has adopted EDGAR system as of quarter t, and 0 otherwise. OVERINV is an indicator which equals 1 if a firm is defined as over-investing and 0 otherwise. *Size* is the natural logarithm of the book value of total assets. Column (1) presents the interaction effect between EDGAR and overinvestment, and Column (2) shows the interaction effect between EDGAR and firm size. Firm and Year\*Quarter fixed effects are included, and standard errors are clustered at the firm level. All other variables are defined as in Appendix B. The t-statistics are reported in parentheses, and significance levels of \*\*\*, \*\*, and \* represent 1%, 5%, and 10%, respectively.

	(1)	(2)
Dep. Var.=	TQ(t+1)	TQ(t+1)
$EDGAR_t$	0.008	-0.068
	(0.35)	(-1.16)
$EDGAR_t$ * $OVERINV_t$	0.261***	
	(5.23)	
$EDGAR_t$ *SIZE <sub>t</sub>		0.031***
		(2.96)
$SIZE_t$	-0.469***	-0.443***
	(-12.33)	(-12.37)
LEVERAGE <sub>t</sub>	-0.486***	-0.476***
	(-5.28)	(-5.65)
$ROA_t$	2.718***	2.378***
	(7.29)	(7.18)
CASHFLOW <sub>t</sub>	0.189*	0.254***
	(1.80)	(2.60)
SALES GROWTH <sub>t</sub>	0.049***	0.050***
	(2.79)	(3.22)
DIVIDENDt	7.455***	8.312***
	(2.68)	(3.31)
$CAPEX_t$	0.176***	0.186***
	(4.47)	(5.20)
$R\&D_t$	-0.073***	-0.075***
	(-2.96)	(-3.35)
Constant	4.099***	3.936***
	(23.35)	(24.11)
Firm FEs	YES	YES
Year*Quarter FEs	YES	YES
Observations	72,191	80,969
Adjusted R-squared	0.673	0.683

#### Table 6: Interaction Analysis – Impact of External Monitoring

This table presents the results of the interaction between EDGAR adoption and external monitoring on Tobin's Q. The dependent variable, TQ (t+1), is the firm's Tobin's Q in quarter t+1. The main independent variable,  $EDGAR_t$ , is an indicator which equals 1 if a firm has adopted EDGAR system as of quarter t, and 0 otherwise. In panel A, we report the interaction effect between EDGAR and institutional ownership, the main independent variable of interest, IO is the percentage of shares owned by institutions, scaled by shares outstanding.  $IO\_HORIZON1$ ,  $IO\_HORIZON2$ ,  $IO\_HORIZON3$  are ownership (as a percentage of shares outstanding) by dedicated, quasi-indexer, and transient investors, respectively. In panel B, we report the interaction effect between EDGAR and analyst coverage. ANACOV is the natural logarithm of 1 plus the number of analysts following the company each quarter. The regressions include firm fixed effects and Year\*Quarter fixed effects, and standard errors are clustered at the firm level. All other variables are defined as in Appendix B. The t-statistics are reported in parentheses, and significance levels of \*\*\*, \*\*, and \* represent 1%, 5%, and 10%, respectively.

	(1)	(2)
Dep. Var.=	TQ(t+1)	TQ(t+1)
$EDGAR_t$	-0.023	-0.015
	(-0.69)	(-0.46)
$EDGAR_t * IO_t$	0.338***	
	(4.59)	
$IO_t$	1.218***	
	(11.81)	
EDGAR*IO_HORIZON1		0.527***
		(4.18)
EDGAR*IO_HORIZON2		0.122
		(1.20)
EDGAR*IO_HORIZON3		0.627***
		(2.81)
IO_HORIZON1		-0.066
		(-0.54)
IO_HORIZON2		0.604***
		(5.13)
IO_HORIZON3		2.982***
		(15.01)
$SIZE_t$	-0.547***	-0.538***
	(-14.41)	(-14.37)
$LEVERAGE_t$	-0.367***	-0.320***
	(-4.30)	(-3.83)
$ROA_t$	2.553***	2.212***
	(7.51)	(6.58)
$CASHFLOW_t$	0.231**	0.198**
	(2.39)	(2.07)
SALES GROWTH <sub>t</sub>	0.051***	0.050***
	(3.18)	(3.14)
DIVIDENDt	7.355***	7.863***

Panel A: Interaction effect of EDGAR and institutional ownership on Tobin's Q

	(2.99)	(3.26)
$CAPEX_t$	0.158***	0.143***
	(4.44)	(4.09)
R&D	-0.083***	-0.081***
	(-3.82)	(-3.82)
Constant	4.090***	4.180***
	(23.59)	(24.32)
Firm FEs	YES	YES
Year*Quarter FEs	YES	YES
Observations	77,588	77,601
Adjusted R-squared	0.703	0.710

	(1)
Dep. Var.=	TQ(t+1)
EDGAR <sub>t</sub>	0.017
	(0.61)
$EDGAR_t *ANACOV_t$	0.061***
	(3.56)
ANACOV <sub>t</sub>	0.209***
	(9.81)
$SIZE_t$	-0.524***
	(-14.03)
LEVERAGE <sub>t</sub>	-0.388***
	(-4.69)
$ROA_t$	2.348***
	(7.19)
CASHFLOW <sub>t</sub>	0.217**
	(2.24)
SALES GROWTH <sub>t</sub>	0.057***
	(3.64)
DIVIDENDt	7.485***
	(3.05)
$CAPEX_t$	0.181***
	(5.07)
$R\&D_t$	-0.072***
	(-3.23)
Constant	4.106***
	(24.87)
Firm FEs	YES
Year*Quarter FEs	YES
Observations	80,969
Adjusted R-squared	0.685

#### Table 7: The Impact of the SEC's EDGAR Amendment of Rules

This table presents the impact of EDGAR amendments of rules on Tobin's Q before and after the structural break (i.e., year 1994), which was introduced after the implementation of EDGAR in the first four treatment groups. Panel A reports regression analysis that divides the sample into the first four groups and the last six groups. The dependent variable, TQ (t+1), is the firm's Tobin's Q in quarter t+1. The main independent variable,  $EDGAR_t$ , is an indicator which equals 1 if a firm has adopted EDGAR system as of quarter t, and 0 otherwise. Column (1) examines the impact of EDGAR implementation on Tobin's Q for Groups CF-01–CF-04. Column (2) examines the impact of EDGAR implementation on Tobin's Q for Groups CF-05–CF-10. Firm and Year\*Quarter fixed effects are included. Panel B uses firms in groups CF-05 to CF-10 as the treatment group and matches each of these treated firms with a control firm from groups CF-01 to CF-04 that in the same industry and has the closest size. Column (1) does not include controls or fixed effects; Column (2) includes Year × Quarter and Cohort fixed effects; Column (3) includes Firm and Cohort fixed effects. The standard errors are clustered at the firm level. All other variables are defined as in Appendix B. The t-statistics are reported in parentheses, and significance levels of \*\*\*, \*\*, and \* represent 1%, 5%, and 10%, respectively.

	GROUPS CF-01 to CF-04	GROUPS CF-05 to CF-10
Subsample used:	(Treatment Before the amendments of	(Treatment After the amendments of
	rules)	rules)
	(1)	(2)
Dep. Var.=	TQ(t+1)	TQ(t+1)
EDGAR <sub>t</sub>	-0.081***	0.150***
	(-3.95)	(3.73)
$SIZE_t$	-0.095**	-0.482***
	(-2.19)	(-11.67)
LEVERAGE <sub>t</sub>	-0.482***	-0.460***
	(-4.61)	(-4.35)
$ROA_t$	5.731***	2.046***
	(10.34)	(5.72)
$CASHFLOW_t$	0.200*	0.223*
	(1.82)	(1.85)
SALES GROWTH <sub>t</sub>	-0.066***	0.062***
	(-2.92)	(3.55)
DIVIDENDt	13.201***	6.616*
	(5.11)	(1.95)
$CAPEX_t$	0.097*	0.201***
	(1.94)	(5.10)
$R\&D_t$	-0.154**	-0.079***
	(-2.05)	(-3.51)
Constant	2.197***	3.767***
	(7.56)	(25.74)
Firm FEs	YES	YES
Year*Quarter FEs	YES	YES
Observations	26,985	53,984

Panel A: Subsample analysis

	(1)	(2)	(3)	
Dep. Var.=	TQ(t+1)	TQ(t+1)	TQ(t+1)	
TREAT*POST <sub>t</sub>	0.143***	0.188***	0.153***	
	(3.30)	(3.45)	(4.10)	
$TREAT_t$	0.579***	0.524***	-	
	(3.67)	(3.23)	-	
$POST_t$	0.065*	0.030	0.040	
	(1.83)	(0.53)	(1.15)	
$SIZE_t$		-0.047	-0.176	
		(-1.43)	(-1.57)	
LEVERAGE <sub>t</sub>		-0.917***	-0.366**	
		(-3.80)	(-2.10)	
$ROA_t$		-0.465	0.599	
		(-0.42)	(0.77)	
$CASHFLOW_t$		1.053***	0.162	
		(3.32)	(1.38)	
SALES GROWTH <sub>t</sub>		0.278***	-0.016	
		(3.98)	(-0.50)	
DIVIDENDt		33.560***	-1.911	
		(4.21)	(-0.44)	
$CAPEX_t$		0.541*	-0.087	
		(1.85)	(-0.69)	
$R\&D_t$		0.506***	-0.018	
		(5.34)	(-0.31)	
Constant	1.381***	1.521***	2.460***	
	(8.98)	(6.05)	(5.66)	
Firm FES	NO	NO	YES	
Year*Quarter FES	NO	YES	NO	
Cohort FES	NO	YES	YES	
Observations	33,263	33,263	33,261	
Adjusted R-squared	0.060	0.170	0.806	

Panel B: Matching firms based on industry and size

#### Table 8: Interaction Analysis – Subsample of early-phase and late-phase treatment firms

This table presents the impact of EDGAR adoption on Tobin's Q for early-phase (Groups CF-01 to CF-04) and late-phase (Groups CF-05 to CF-10) subsamples, considering the structural break in 1994. The dependent variable, TQ (t+1)), is the firm's Tobin's Q in quarter t+1. Columns (1)–(3) present results for firms treated before the amendments of rules, while Columns (4)–(6) focus on firms treated after the amendments. The main independent variable,  $EDGAR_t$ , is an indicator which equals 1 if a firm has adopted EDGAR system as of quarter t, and 0 otherwise. OVERINV is an indicator which equals 1 if a firm is defined as over-investing and 0 otherwise, IO is the percentage of shares owned by institutions, scaled by shares outstanding, ANACOV is the natural logarithm of 1 plus the number of analysts following the company each quarter. The regressions include firm fixed effects and Year\*Quarter fixed effects, and standard errors are clustered at the firm level. All other variables are defined as in Appendix B. The t-statistics are reported in parentheses, and significance levels of \*\*\*, \*\*, and \* represent 1%, 5%, and 10%, respectively.

	GROUPS CF-01 to CF-04			GROUPS CF-05 to CF-10		
Subsample used:	(Early-phase Treatment Firms)			(Late-phase Treatment Firms)		
	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.=	<i>TQ</i> ( <i>t</i> +1)					
$EDGAR_t$	-0.081***	-0.118***	-0.05	0.041	0.031	0.071
	(-3.36)	(-3.26)	(-1.44)	(0.93)	(0.64)	(1.58)
EDGAR <sub>t</sub> *OVERINV <sub>t</sub>	-0.036			0.388***		
	(-0.74)			(5.72)		
$EDGAR_t * IO_t$		0.1			0.472***	
		(1.54)			(4.2)	
$IO_t$		0.705***			1.550***	
		(5.61)			(11.34)	
$EDGAR_t *ANACOV_t$			-0.019			0.121***
			(-1.23)			(3.66)
$ANACOV_t$			0.117***			0.247***
			(5.88)			(8.39)
$SIZE_t$	-0.090**	-0.131***	-0.126***	-0.544***	-0.661***	-0.611***
	(-2.04)	(-2.96)	(-3.13)	(-12.14)	(-14.35)	(-13.64)
LEVERAGE <sub>t</sub>	-0.439***	-0.446***	-0.452***	-0.478***	-0.305***	-0.341***
	(-4.04)	(-4.30)	(-4.42)	(-4.09)	(-2.82)	(-3.30)
$ROA_t$	5.952***	5.287***	5.604***	2.358***	2.319***	2.066***
	(9.98)	(10.15)	(10.34)	(5.83)	(6.29)	(5.9)
CASHFLOW <sub>t</sub>	0.224*	0.190*	0.192*	0.128	0.203*	0.172
	(1.9)	(1.78)	(1.76)	(0.98)	(1.67)	(1.44)
SALES GROWTH <sub>t</sub>	-0.063***	-0.058***	-0.063***	0.060***	0.065***	0.069***
	(-3.54)	(-2.59)	(-2.81)	-3.03	-3.55	-3.93
DIVIDENDt	13.093***	13.255***	12.270***	5.895	5.475	6.799**
	(4.79)	(5.08)	(4.84)	(1.54)	(1.63)	(2.06)

$CAPEX_t$	0.117**	0.08	0.086	0.187***	0.179***	0.200***
	(2.27)	(1.62)	(1.64)	(4.29)	(4.54)	(5.09)
$R\&D_t$	-0.154*	-0.147**	-0.154**	-0.079***	-0.086***	-0.076***
	(-1.96)	(-2.08)	(-2.01)	(-3.16)	(-3.94)	(-3.40)
Constant	2.149***	2.104***	2.209***	4.026***	4.138***	4.075***
	(7.34)	(7.38)	(8.12)	(25.16)	(25.39)	(26.36)
Firm FEs	YES	YES	YES	YES	YES	YES
Year*Quarter FEs	YES	YES	YES	YES	YES	YES
Observations	24,794	26,864	26,985	47,397	50,724	53,984
Adjusted R-squared	0.759	0.778	0.775	0.659	0.69	0.671

#### **Table 9: Robustness Tests**

This table reports two robustness tests. Panel A reports result estimated with additional fixed effects that are introduced to control for unobserved heterogeneity. Panel B reports result from different regression samples. The dependent variable, TQ(t+1), is the firm's Tobin's Q in quarter t+1. The main independent variable,  $EDGAR_t$ , is an indicator which equals 1 if a firm has adopted EDGAR system as of quarter t, and 0 otherwise. In Panel A, column (1) includes Firm, Year\*Quarter and State fixed effects; column (2) includes Firm, Year, and Quarter fixed effects; column (3) includes Firm, Year\*Quarter\*industry fixed effects; column (4) includes Cohort fixed effects. In Panel B, column (1) excludes Group CF-01 (the earliest group of firms affected by the shock) and Group CF-10 (the last group of firms affected by the shock); column (2) uses a different filter, following Goldstein et al. (2023), we excluded firms with total assets of less than \$10 million in the year prior to EDGAR implementation (1992); column (3) uses a [-6, +6] quarter window around each event and includes only those observations within this window. The standard errors are clustered at the firm level. All other variables are defined as in Appendix B. The t-statistics are reported in parentheses, and significance levels of \*\*\*, \*\*, and \* represent 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)
Dep. Var.=	TQ(t+1)	TQ(t+1)	TQ(t+1)	TQ(t+1)
$EDGAR_t$	0.059***	0.068***	0.077***	0.119***
	(2.72)	(3.34)	(3.63)	(5.72)
$SIZE_t$	-0.451***	-0.432***	-0.433***	0.004
	(-11.88)	(-12.20)	(-12.24)	(0.22)
LEVERAGE <sub>t</sub>	-0.455***	-0.478***	-0.463***	-1.549***
	(-5.28)	(-5.66)	(-5.53)	(-16.53)
$ROA_t$	2.818***	2.383***	2.338***	-1.157**
	(8.38)	(7.18)	(7.07)	(-1.97)
CASHFLOW <sub>t</sub>	0.179*	0.252**	0.278***	1.187***
	(1.88)	(2.57)	(2.84)	(5.02)
SALES GROWTH <sub>t</sub>	0.037**	0.049***	0.051***	0.308***
	(2.30)	(3.17)	(3.26)	(11.64)
DIVIDENDt	7.401***	8.008***	7.896***	34.928***
	(2.71)	(3.18)	(3.16)	(6.97)
$CAPEX_t$	0.171***	0.182***	0.184***	0.162***
	(4.59)	(5.10)	(5.22)	(2.65)
$R\&D_t$	-0.090***	-0.072***	-0.070***	0.308***
	(-3.90)	(-3.22)	(-3.13)	(7.98)
Constant	4.004***	3.901***	3.899***	1.951***
	(22.94)	(24.13)	(24.17)	(21.96)
Firm FEs	YES	YES	YES	NO
Year*Quarter FEs	YES	NO	NO	NO
State FEs	YES	NO	NO	NO
Year FEs	NO	YES	NO	NO
Quarter FEs	NO	YES	NO	NO
Year*Quarter*industry FEs	NO	NO	YES	NO
Cohort FEs	NO	NO	NO	YES
Observations	74121	80,969	80,969	80,969

Panel A: Controlling for Alternative Fixed Effects

	(1)	(2)	(3)
Dep. Var.=	TQ(t+1)	TQ(t+1)	TQ(t+1)
EDGARt	0.052**	0.060***	0.057***
	(2.36)	(3.34)	(2.97)
$SIZE_t$	-0.392***	-0.276***	-0.392***
	(-9.60)	(-8.44)	(-7.06)
LEVERAGE <sub>t</sub>	-0.376***	-0.512***	-0.340***
	(-4.17)	(-6.51)	(-3.18)
$ROA_t$	2.702***	4.146***	2.334***
	(7.22)	(12.55)	(6.37)
CASHFLOW <sub>t</sub>	0.224**	0.178**	0.191*
	(2.10)	(2.08)	(1.71)
SALES GROWTH <sub>t</sub>	0.033**	0.007	-0.009
	(1.97)	(0.45)	(-0.47)
DIVIDEND <sub>t</sub>	5.752**	8.823***	0.472
	(2.31)	(4.14)	(0.19)
$CAPEX_t$	0.208***	0.127***	0.089**
	(5.06)	(3.29)	(2.13)
$R\&D_t$	-0.074***	-0.078***	-0.042
	(-2.59)	(-2.75)	(-1.08)
Constant	3.649***	3.120***	3.713***
	(19.42)	(18.87)	(14.32)
Firm FEs	YES	YES	YES
Year*Quarter FEs	YES	YES	YES
Observations	67,435	65,957	36,139
Adjusted R-squared	0.700	0.710	0.776

# Panel B: Using different regression samples

# Appendix A: Phase-in Schedule of Edgar

Implementation Date	Group		
April 26, 1993	Phase-in of Group CF-01		
July 19, 1993	Phase-in of Group CF-02		
October 4, 1993	Phase-in of Group CF-03		
December 6, 1993	Phase-in of Group CF-04		
SEC regulatory pause and amendment of rule			
January 30, 1995	Phase-in of Group CF-05		
March 6, 1995	Phase-in of Group CF-06		
May 1, 1995	Phase-in of Group CF-07		
August 7, 1995	Phase-in of Group CF-08		
November 6, 1995	Phase-in of Group CF-09		
May 6, 1996	Phase-in of Group CF-10		

Appendix B: Variable Definitions

Variable	Definition
EDGAR	An indicator that equals 1 if after a firm becomes a mandatory EDGAR filer in quarter t, and 0 otherwise.
TQ (t+1)	The book value of total assets (ATQ) minus the book value of equity (CEQQ) plus the market value of equity (CSHOQ×PRCCQ), scaled by the book value of total assets (ATQ) in quarter t+1.
CASHFLOW	Operating Activities - Net Cash Flow scaled by lagged total asset (ATQ). Compustat quarterly data provides the year-to-date amount of net cash flow (OANCFY). We therefore set quarterly net cash flow to be OANCFY (in the first fiscal quarter) or the change in OANCFY (in the second, third, and fourth fiscal quarters).
SIZE	The natural logarithm of the book value of total assets (ATQ).
LEVERAGE	Leverage (lev) is defined as the ratio of Long-Term Debt (DLTTQ) to total assets (ATQ).
ROA	Operating Income Before Depreciation and Amortization (OIBDPQ) divided by Total Assets (ATQ).
SALES GROWTH	The percentage increase or decrease in sales (SALEQ) from the previous period to the current period.
DIVIDEND	Cash dividends (DVY) scaled by Total Assets (ATQ). Compustat quarterly data provides the year-to-date amount of cash dividends (DVY). We therefore set quarterly cash dividends to be DVY (in the first fiscal quarter) or the change in DVY (in the second, third, and fourth fiscal quarters).
R&D	Research and Development Expense (XRDQ) scaled by sales (SALEQ).
CAPEX	Capital expenditure (CAPXY) scaled by sales (SALEQ).
EDGARm3	An indicator that equals 1 for quarter that is three quarters before the firm's EDGAR adoption quarter, and 0 otherwise.
EDGARm2	An indicator that equals 1 for quarter that is two quarters before the firm's EDGAR adoption quarter, and 0 otherwise.
EDGARm1	An indicator that equals 1 for quarter that is one quarter before the firm's EDGAR adoption quarter, and 0 otherwise.
EDGAR0	An indicator that equals 1 in the quarter of EDGAR adoption and 0 otherwise.
EDGARp1	An indicator that equals 1 for quarter that is one quarter after the firm's EDGAR adoption quarter, and 0 otherwise.
EDGARp2	An indicator that equals 1 for quarter that is two quarters after the firm's EDGAR adoption quarter, and 0 otherwise.
EDGARp3	An indicator that equals 1 for quarter that is three quarters after the firm's EDGAR adoption quarter, and 0 otherwise.

EDGARp4	An indicator that equals 1 for quarter that is four or more quarters after the firm's EDGAR adoption quarter, and 0 otherwise.
OVERINV	The deviation from expected investment behavior, where firms in the highest residual quartile of a regression of asset growth on sales growth are classified as overinvesting, based on the methodology of Biddle et al. (2009).
ΙΟ	The percentage of shares owned by institutions, scaled by shares outstanding.
IO_HORIZON1	Ownership (as a percentage of shares outstanding) by dedicated investors.
IO_HORIZON2	Ownership (as a percentage of shares outstanding) by quasi-indexer investors.
IO_HORIZON3	Ownership (as a percentage of shares outstanding) by transient investors.
ANACOV	The natural logarithm of 1 plus the number of analysts following the company each quarter.

#### Appendix C: Revised EDGAR adoption guideline in 1994

This table presents the difference of EDGAR Rules applicable to earlier adopters (i.e., firms that start adoption in year 1993, i.e., CF01 ~ CF04) and latter adopters (firms that start adoptions in or after 1995, i.e., CF05 ~ CF10). Source: Federal Register, Release No. 33-7122 (page 67754).

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with all rules promulgated by the Commission, all persons making filings with the Commission, including those making third-party filings with respec to electronic registrants, are responsible for apprising themselves of their new obligations associated with filing on the EDGAR system. While the staff attempts to contact registrants in each phase-in group by furnishing a copy of the EDGAR Filer Manual and EDGARLink software prior to phase-in, filers will not be relieved of their electronic filing obligations in the absence of such notification.

#### **III. Amendments to EDGAR Rules**

The staff has gained substantial experience with the EDGAR system and its implementing regulations since the first mandated filings were made in April 1993, and determined that certain refinements to its electronic filing rules would be desirable. Proposed amendments were published for comment in July 1994.<sup>28</sup> The Commission received seven comment letters with respect to the proposed changes.<sup>29</sup> With few exceptions, to be addressed below in the context of specific rule changes, the proposed amendments were well received by the commenters. Consequently, the Commission has determined to adopt the amendments in nearly all cases proposed; modifications to accommodate commenters' concerns will be identified below. Many of the amendments are minor changes affecting substantive filing requirements (several of which represent codifications of staff interpretations), or clarifying language in the current requirements in an effort to enhance filers' understanding of their electronic filing obligations. Others consist of matters involving Commission procedures and practices as well as technical corrections to the rules adopted previously. The specific amendments are addressed below.

#### A. Changes to Regulation S-T

Regulation S-T, which controls the preparation and submission of

requests under Rule 901(a)(2) of Regulation S-T [17 CFR 232.901(a)(2)] to Sylvia J. Reis or Serena C. Swegle, Mail Stop 3-6, 450 Fihh Street, N.W., Washington, D.C. 20549 ((202) 942-2940). Investment Management registrants should submit requests for a change in phase-in date under Rule 902(d) of Regulation S-T [17 CFR 232.902(d)] to Anthony A. Vertuno or Ruth Armfield Sandars, Mail Stop 10-6, at the same address ((202) 942-0591). 28 See Release No. 33-7074.

<sup>24</sup> The comment latter are available for inspection and copying in the public reference room at the Commission's headquarters. (File No. S7-20-94):

electronic filings to the Commission, is amended as described below

• Rule 12(b) of Regulation S-T. Regulation S-T is amended to codify that electronic filers are permitted to submit filings on diskette and magnetic tape to the Commission's Operations Center in Alexandria, Virginia. Filers who file on diskette and magnetic tape may prefer to send them directly to the **Operations Center to expedite** acceptance processing of their submissions, since diskettes and tapes sent to the Commission's headquarters must be forwarded to the Operations Center for processing

New Rule 13(d) of Regulation S-T. Exchange Act Rule 14a-6(b) provides that definitive proxy statements may be "filed with, or mailed for filing to, the Commission not later than the date such material is first sent or given to any security holder."<sup>30</sup> Similar provisions are found in other Commission rules.3 Although electronic filers could mail diskettes or magnetic tapes, those choosing to file by direct transmission do not currently have this option. Instead, they must file before or on the date the paper counterpart is mailed to investors; such filing date must be a business day of the Commission. Paper filers (or those using diskettes or magnetic tape) have more flexibility, because not only can they satisfy their filing obligations by putting copies in the mail to the Commission at the time of distribution (thus allowing the actual filing to occur after the distribution), they also can satisfy their filing obligation by mailing on Saturday or Sunday, an option not available to direct transmission filers. To place electronic filers on the same footing with paper filers with respect to thes filing requirements, the Commission proposed that a new provision be added to Regulation S-T allowing electronic filers to file their definitive proxy materials (or other documents, as applicable) before or on the date the paper distribution is made, or if the distribution does not occur on a business day of the Commission, as soon as practicable on the next business

#### 30 17 CFR 240.14a-6(b)

<sup>30</sup> 17 CFR 240.14a-6(b).
<sup>31</sup> See 17 CFR 240.14a-6(c) (relating to personal soliciting materials); 17 CFR 240.14a-11(c) (relating to information delivered to investors prior to sending a required proxy statement in an election contest); 17 CFR 240.14a-12(b) (relating to delivery of soliciting materials prior to sending a required proxy statement in circumstances other than election contests); 17 CFR 240.14a-5(b) (relating to definitive information statements); and 17 CFR 240.16b-3(b)(2)(ii) (relating to employee benefit plan information to be furnished to investors prior to a vote on changes to the plan).

day. The change has been adopted as

proposed. • Rule 101(a)(1)(i) of Regulation S-T. The Regulation S-T list of mandated electronic submissions has been revised to specifically include prospectuses filed under the Securities Act.<sup>32</sup>

• Rule 101(a)(1)(iii) of Regulation S-T. The Regulation S-T list of mandated electronic submissions has been revised to specifically exclude Form 13F<sup>33</sup> from the list of mandated electronic filings, consistent with other rule provisions and codifying current staff interpretations.<sup>34</sup> • New Rule 101(b)(3) of Regulation S-

T. As proposed, all employee benefit plans will be permitted to file their entire annual report on Form  $11-K^{35}$  in per or in electronic format.36 Prior to this amendment, Regulation S-T required Forms 11-K to be filed electronically,<sup>37</sup> but registrants were allowed to file any financial statements and schedules prepared in accordance with the financial reporting requirements of the Employee Retirement Income Security Act of 1974 ("ERISA") <sup>38</sup> in paper under cover of Form SE.<sup>39</sup> Four commenters responded to the Commission's solicitation of views on the treatment of Forms 11–K. All supported relief from electronic presentation for at least a portion of the financial information required in these reports. Two indicated that electronic filing should be completely optional. Another supported optional electronic filing at least for annual reports filed by ERISA plans. The final commenter believed that Forms 11-K should continue to be filed electronically, with

<sup>32</sup> This makes it clear that prospectus filings pursuant to Securities Act Rules 424 [17 CFR 230.424] and 497 [17 CFR 230.497] are to be filed electronically. For investment company filings, Rule 101(a)(1)(i) includes statements of additional information and, where required to be filed with the Commission, prospectuses submitted under Securities Act Rule 482 [17 CFR 230.482]. See amendments to paragraphs (a) and (e) of Rule 902 of Regulation S-T, which codfy a limited exception to the electronic filing requirements for Securities Act Rule 497 filings.

<sup>33</sup> 17 CFR 249.325. <sup>34</sup> See Rule 903(a)(3) of Regulation S–T [17 CFR 232.903(a)(3)]. See also Section V of Release No. IC–

232.003(a)[(3)]. See also Section - of the section - of t for an amendment to Forms 10-K or 10-KSB filed for any other reason. <sup>37</sup>Rule 101(a)(1)(iii) of Regulation S-T [17 CFR 232 101(a)(1)(iii)

232.101(a)(1)(iii)) 38 Pub. L. No 93-406 (codified at 29 U.S.C. 1001

et seq.). <sup>39</sup> 17 CFR 232.311(c) and General Instruction E of Form 11-K. Form SE is found at 17 CFR 239.64. 249.444, 259.603, 269.8, and 274.403.

# Appendix D: The Impact of the SEC's EDGAR Amendment of Rules using the propensity-score-matched sample

This table reports the regression results based on control firms selected through propensity score matching for the treatment Groups CF-05 to CF-10. We employ nearest-neighbor matching with replacement, allowing each treated firm to be matched to the control firm with the most similar propensity score, and permitting control firms to be matched to multiple treated firms. The matching procedure is based on a set of firm characteristics, including *SIZE*, *LEVERAGE*, *ROA*, *CASHFLOW*, *SALES GROWTH*, *DIVIDEND*, *CAPEX*, *R&D*. In Column (1), control firms are selected from Groups CF-01 to CF-04. In Columns (2) to (4), control firms are drawn from firms that did not change their method of filing during the two quarters prior to and the two quarters following the quarter in which the corresponding treatment firm adopted the EDGAR system. Column (1) includes Firm and Year × Quarter fixed effects; Column (2) does not include control variables and fixed effects; Column (3) includes Year × Quarter and Cohort fixed effects; Column (4) includes Firm and Cohort fixed effects. The standard errors are clustered at the firm level. All other variables are defined as in Appendix B. The t-statistics are reported in parentheses, and significance levels of \*\*\*, \*\*, and \* represent 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)
Dep. Var.=	TQ(t+1)	TQ(t+1)	TQ(t+1)	TQ(t+1)
TREAT*POST <sub>t</sub>	0.089**	0.191**	0.163*	0.150*
	(1.98)	(2.02)	(1.78)	(1.95)
$TREAT_t$	-	-0.053	-0.087	-0.219***
	-	(-0.50)	(-0.81)	(-2.83)
$POST_t$	0.092**	0.091	0.071	0.152**
	(2.55)	(1.00)	(0.76)	(2.18)
$SIZE_t$	-0.146		-0.104**	-0.350***
	(-1.35)		(-2.02)	(-3.55)
$LEVERAGE_t$	-0.530***		-1.496***	-0.644***
	(-2.91)		(-6.26)	(-3.22)
$ROA_t$	2.083***		0.623	2.103***
	(4.44)		(0.62)	(4.72)
$CASHFLOW_t$	-0.267*		0.482	-0.063
	(-1.70)		(1.16)	(-0.31)
SALES GROWTH <sub>t</sub>	-0.054*		0.337***	0.036
	(-1.96)		(4.91)	(0.69)
DIVIDENDt	6.188		22.761	3.871
	(1.36)		(1.62)	(1.00)
$CAPEX_t$	0.190**		0.127	0.135**
	(2.22)		(1.18)	(1.99)
$R\&D_t$	-0.115		0.381***	-0.085
	(-1.21)		(4.54)	(-1.38)
Constant	2.204***	1.900***	2.394***	3.306***
	(4.44)	(18.82)	(10.80)	(9.16)
Firm FEs	YES	NO	NO	YES

Year*Quarter FEs	NO	NO	YES	NO
Cohort FEs	YES	NO	YES	YES
Observations	12,418	24,545	24,545	24,543
Adjusted R-squared	0.841	0.005	0.107	0.782