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Author(s): Mostafa Harakeh, Ghida Matar, Nagham Sayour

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"Information Asymmetry and Dividend Policy around the Sarbanes-Oxley Act"

Mostafa Harakeh[ψ]
Ghida Matar
Nagham Sayour

Lebanese American University

ABSTRACT:

Purpose: The literature of financial economics documents a causal relationship between the level of information asymmetry in the firm and its dividend policy. Nevertheless, this relationship suffers endogeneity problems arising from reverse causality and omitted variable bias. The purpose of this study is to examine how the dividend policy reacts to changes in asymmetric information in an exogenous research setting.
Design/methodology/approach: To overcome endogeneity concerns, we employ the enactment of the Sarbanes-Oxley Act (SOX) in the US in 2002 as a source of an exogenous variation in the level of information asymmetry to study the potential effect that this variation might have on the dividend policy. In doing so, we utilize a difference-in-differences research design, in which the treatment group is US publicly traded firms that were exposed to the policy and the control group is publicly traded companies in the UK where SOX was not enacted. Both countries have similar institutional settings and enforcement of laws, which makes them comparable in our research context.
Findings: Our findings show that, compared to UK companies, US firms increase their dividend payments following a reduction in asymmetric information as a result of the SOX enactment.
Originality/value: The study contributes to the literature of financial economics by showing that policy makers can mitigate agency conflicts and protect shareholders by improving the corporate information environment and reducing asymmetric information.

Keywords: Information shocks; Information Asymmetry; Dividend Policy; Corporate Financial Decisions; Sarbanes-Oxley Act.

Paper type: Research paper.

[ψ] Corresponding author: mostafa.harakeh@lau.edu.lb
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1. Introduction

The agency problem between corporate insiders (i.e., managers) and outside shareholders over dividend policy is triggered by the presence of asymmetric information between both parties (See the survey of Allen and Michaely, 2003). Managers might take decisions that do not maximize shareholder's wealth to benefit themselves privately, especially when outside shareholders do not have complete information about the managers' behavior (La Porta et al., 2000). Accordingly, when information asymmetry is high and outside shareholders cannot monitor managerial decisions, dividend payments are expected to decrease (Koo et al., 2017). Another explanation to the relationship between information asymmetry and dividend policy is the pecking order theory, that was developed by Myers and Majluf (1984) who theorize that, under high levels of asymmetric information, managers will have to finance their investments at a high cost (i.e., shareholders offer low prices for issued equity and creditors require high interest rates for issued debt). Therefore, to avoid costly financing, managers prefer to retain cash inside the firm instead of paying dividends. Concurrently, prior studies have shown that, if managers increase dividend payments, then investors are pacified, and accordingly, the level of information asymmetry falls significantly (DeAngelo et al., 2008). Therefore, a reverse causal relationship exists between information asymmetry and dividend policy, which creates an empirical challenge to researchers. We endeavor to overcome this econometric challenge by employing an information shock to the US capital market as a source of an exogenous variation in the level of information asymmetry to study the potential effect that this variation has on the dividend policy.

In principal, information asymmetry arises when insider managers know more about the fundamental value of the firm and its investing activities than outside investors do (Miller and Rock, 1985). A main recurring challenge in empirically studying information asymmetry is the endogeneity concern stemming from unobservable managerial intentions and decisions which affect corporate financial decision making, including the dividend policy (Easterbrook, 1984). Thus, studying the relationship between information asymmetry and dividend policy is also prone to omitted variable bias because managerial intentions affect both variables. Researchers have tried to control for managerial intentions through including variables that proxy for corporate governance and financial reporting quality; however, such controls do not completely capture managerial intentions especially when cross-sectional heterogeneity is high. Moreover, some studies find that investors demand less dividend payments when information asymmetry is low because they are more assured about the wealth they invested in the firm (Hail et al., 2014). As such, the relationship between information asymmetry and dividend policy stays ambiguous and is worth to be tested empirically in different contexts.

In this paper, we try to overcome the above-mentioned empirical challenges, by studying how the dividend policy reacts to changes in information asymmetry in a roughly exogenous research setting. Specifically, we employ a difference-in-differences research design that examines the effect of the Sarbanes-Oxley (SOX) act, which was enacted in the US in 2002, on the level of information asymmetry. The SOX act was designed to diminish the existing information gap between managers and shareholders. The act mandated chief officers (CEOs and CFOs in specific) to approve and sign the annual reports disclosed by their companies and imposed severe penalties and sanctions on managers in case these reports do not fairly represent the firm's financial position. Moreover, all public companies were required to have an audit committee that is comprised of independent directors as a part of the board of directors. Finally, the SOX act created the Public Company Accounting Oversight Board to oversee, regulate, inspect, and discipline auditing firms in their financial monitoring role. As a result, corporate governance and financial disclosure have improved significantly following the SOX act (Coates, 2007).

We first hypothesize that the benefits that SOX brings to the corporate environment, specifically the improved corporate governance and financial disclosure, are expected to mitigate the level of information asymmetry between corporate insiders and outside shareholders (DeAngelo et al., 2008). When information asymmetry is mitigated, the agency theory predicts that the managerial discretion over corporate financial decisions will decrease. Therefore, managers will pay the generated profits as dividends rather that expropriating them by investing in projects that do not maximize shareholders value. In addition, the pecking order theory posits that lower information asymmetry facilitates external financing, which assures managers of the ease of raising funds at a relatively low cost to finance ongoing and potential investments. Thus, managers will pay more dividends rather than retaining earnings inside the firm. As such, our second hypothesis predicts that the dividend payments will increase following the enactment of the SOX act among US firms.

To examine the change in the variables of interest, we employ a difference-in-differences research design in which the treatment group is US publicly traded firms that were exposed to the policy while the control group is a set of public firms listed in the UK. The reasoning behind selecting the UK as a control group is that the capital markets in both countries are similar to a great extent (La Porta et al., 1998). Specifically, both countries have similar institutional settings, investor's protection, and enforcement of laws, which makes the selection of the UK as a control group a plausible decision (Ferreira de Mendonça et al., 2012; Leuz and Wysocki, 2016).

Using a sample of US and UK public firms between 1997 and 2007, we show that the level of information asymmetry declined significantly in the US following the SOX enactment as compared to the reduction in the level of information asymmetry among UK firms. More importantly, we find that dividend payments increased after 2002 among US firms as compared to UK firms. To gain further confidence in our results, and to attribute the increase in dividend payments to the reduction in asymmetric information, we perform a subsample analysis in which we show that firms with higher information asymmetry *ex ante* witness a greater reduction in their asymmetric information, and accordingly, increase their dividend payments more following SOX. Our results are robust to falsification tests that examine whether similar changes took place prior to the SOX enactment (i.e., testing for a common trend). Moreover, we examine whether the effect of the SOX act kicked off immediately post-2002. The results show an immediate reduction in information asymmetry and increase in dividend payments following the act. Overall, our findings contribute to the financial economics literature by showing how a lower level of information asymmetry protects outside shareholders by enhancing their monitoring ability and increasing their dividend payments.

The next section reviews the literature on information asymmetry, dividend policy as well as the evaluation of the SOX act. Section 3 develops the hypotheses to be tested. Section 4 discusses the research methodology. Section 5 explains the sample selection and presents descriptive statistics. Section 6 shows the results and section 7 concludes.

2. Literature Review

2.1. Information asymmetry in corporations

In his seminal paper "The Market for Lemons", George Akerlof started in 1970 a long standing literature on the economic consequences of information asymmetry (Akerlof, 1970). Akerlof theorizes that when the seller has superior information to the buyer, the seller will try to sell the bad quality goods first and keep the good quality goods to maximize his returns. Akerlof shows that this causes an *adverse selection* problem where buyers will keep on discounting prices of all (good and bad) goods as they cannot tell which item is correctly priced. Eventually, under extreme scenarios, the whole market will collapse due to asymmetric information. Akerlof then continues to show how symmetric information between market participants can restore a healthy market (or economy). Specifically, he introduces the role of *counteracting institutions* in providing some quality assurance to buyers, for example, guarantees or warranties for products. In our setting, the capital market, the *counteracting institutions* are the government institutions (and external auditors to some extent).

Since its introduction to the field of financial economics, the concept of information asymmetry has played a major role in accounting and finance research (see the surveys of Biais et al., 2005; Healy and Palepu, 2001). Even in financial accounting, Scott (2015, p. 137) states that information asymmetry is undoubtedly the most important concept of finance theory. Information asymmetry derives its critical role in financial markets from the fact that severe levels of asymmetric information might lead to a complete collapse of markets. A recent example is the so-called subprime crisis in 2008 (Ryan, 2008, p. 1626), when the US economy was about to collapse because of inaccurate (and misleading) information circulated among capital investors (Balakrishnan et al., 2016). Given these tragic consequences, regulators and accounting standard setters strive to mitigate information asymmetry through enforcing policies and financial reporting standards which aim to diminish the information gap between market participants.

2.2. Dividend payments and information asymmetry

We explain the relationship between dividend payments and information asymmetry via two channels. The first channel is the free cash flow problem (Jensen, 1986). In fact, the free cash flow problem is the most serious agency conflict in which managers expropriate shareholder's wealth by underpaying dividends and maximizing personal benefits instead. Some examples include investing in value-destroying projects to increase executive compensation, power, and prestige. Such managerial activities are likely to be invisible to shareholders due to high levels of information asymmetry and reporting opacity (Koo et al., 2017). Accordingly, mitigating information asymmetry and enhancing transparency can alleviate the free cash flow problem by constraining managerial discretion over free cash flow. When shareholders are more capable of monitoring managerial decisions, managers are under higher pressure to pay out profits in the form of dividends rather than retaining them inside the firm. The second channel is the financing constraint channel (Myers and Majluf, 1984). When information asymmetry between insiders (managers) and outsiders (investors) is at high levels, the cost of raising external funds becomes too high. As such, when an investment opportunity arises, and managers refuge to the capital market to raise external funds, investors will put high discounts on the issued financial securities. Specifically, equity investors will discount the price of the offered shares and debt investors (i.e., creditors) will require higher interest rates to compensate for the higher risk induced by asymmetric information. Given the difficulties that face managers to access external financing under high levels of information asymmetry, they prefer to retain profits inside the firm to finance future investments and avoid costly financing. Therefore, if levels of information asymmetry decrease, managers can access external financing at a lower cost when needed, and accordingly, they will pay dividends rather than retaining profits.

2.3. The Sarbanes-Oxley act

In the wake of a series of large corporate accounting scandals that broke out in the United States in the 2000-2002 period, the controversy over regulating corporate governance and restoring confidence in the reliability of the financial statements was reinvigorated. The Congress responded to these irregularities with the enactment of the Sarbanes-Oxley (SOX) Act to improve the auditing of US public companies. A new accountability framework for reporting was instituted by this Act through the establishment of a quasi-public institution, the Public Company Accounting Oversight Board (PCAOB), in order to strengthen the regulation and oversight of auditing, resulting in an end to the self-regulatory audit profession. Specifically, section 301 of SOX required all audit committees to be comprised exclusively of independent directors. These committees were charged with direct responsibility for the appointment, compensation, and oversight of the internal auditing process (Coates and Srinivasan, 2014). In addition, SOX has increased the legal and financial penalties for individuals engaging in financial fraud and intended the necessity for corporate executives to ratify the contents of financial reports. The litigation risk among US public firms spiked by the end of 2002 (Arping and Sautner, 2013).

There exists a considerable number of studies that tackle the effect of the SOX act on the economics of information provided by public firms to the US. The Securities and Exchange Commissions (SEC), the governmental institution that is responsible for regulating the US capital market, launched a large-scale survey about the consequences of SOX. More than 1000 public firms responded to the survey and indicated that SOX was able to enhance investor's confidence in financial reports (SEC, 2009, 2011). In the same vein, Cohen et al. (2013) interviewed corporate directors and mentioned that the surveyed directors indicate that SOX contributed in empowering internal audit committees and increasing their responsibilities, which was reflected in a better audit quality. Moreover, several studies document a significant improvement in the corporate financial information environment following SOX. Cohen et al. (2008) find that earnings manipulation declines significantly post-2002 after it has been increasing steadily since late 1980's. Similarly, Bartov and Cohen (2009) and Koh et al. (2008) find that the phenomenon of just meeting or beating analysts' forecasts has become less popular among firms, which indicates that firms used to manipulate their earnings before SOX to reach the expected figures (i.e., analysts' forecasts) and refrained from doing that following SOX. Finally, SOX required firms to disclose *internal control* reports, which have proved to be informative to investors. The literature documents that firms with internal control weaknesses are likely to have lower financial reporting quality, less precise management forecasts, more auditor resignations, and more SEC actions (Ashbaugh-Skaife et al., 2008; Doyle et al., 2007; Feng et al., 2009). Accordingly, such firms bear higher costs when raising equity (Hammersley et al., 2008) and issuing debt (Kim et al., 2011) due to the higher risk arising from low-quality information.

3. Hypotheses Development

3.1. The Sarbanes-Oxley act and information asymmetry

In light of the reviewed studies in the preceding section, we argue that the Act has proven to be effective, especially in improving financial reporting and audit quality, to the benefit of investors and stakeholders (Alexander et al., 2013). According to Coates (2007), laws were available before SOX but not effective enough to prevent fraud and theft. In addition to enhancing financial disclosure quality, SOX also provides many benefits on the long-term for companies: it works on improving corporate governance systems, transparency, and information quality (involving the delicate dissemination of information). The higher the availability of information in the corporate environment, the lower the information asymmetry and the lower the required return on equity since stocks are perceived as being less risk (Easley and O'Hara, 2004; Stiglitz, 2002). In principle, information asymmetry exists when knowledge about a firm's fundamental value is unequally distributed among its investors (Akerlof, 1970). Information asymmetry impacts corporate financial decisions due to confidence issues between corporate insiders and outside shareholders (Jensen, 1986; Myers and Majluf, 1984). According to Ramalingegowda, Wang and Yu (2013), the main agency conflict arises due to disagreements over investing and financing decisions, including the dividend policy.

As far as SOX is concerned in the information asymmetry context, Coates (2007) presents the successive implementation of SOX by comparing liquidity and investor's confidence pre- and post- SOX, to show a decline in these figures in the years prior the implementation of the act. The author argues that the enhanced disclosure and improved governance that were enforced by SOX are expected to demean the value of private information, i.e., lower information asymmetry. As such, Coates (2007) concludes that, SOX would allow investors to be more knowledgeable about the firm's fundamental value, and thus, SOX would eventually lead to a reduction in information asymmetry. In the same vein, Abdioglu et al. (2015) tackle the impact of SOX on foreign institutional investors and find that such investors take more risk subsequent to the enactment of SOX due to their higher confidence in the regulations. The authors conclude that the better internal controls and mechanisms induced by SOX reduce information asymmetries and therefore lessen agency costs. Therefore, SOX is expected to improve the efficiency of capital markets through mitigating information asymmetry, and consequently, reducing the costs associated with financial policies. Despite that testing the impact of SOX on information asymmetry has been tackled before (e.g., Coates, 2007; Gupta et al., 2018), yet none of prior studies implemented a difference-in-differences design. Moreover, we need to confirm this finding using our dataset rather than assuming a reduction in asymmetric information following the SOX enactment. Accordingly, we formulate the following hypothesis.

Hypothesis 1: *Information asymmetry decreases following the enactment of the SOX act.*

3.2. Information asymmetry and the dividend policy

The relationship between SOX enactment and dividend policy is characterized by the change in the level of information asymmetry. In their survey on the corporate dividend policy, DeAngelo et al. (2008) propose a theoretical framework which develops the pioneering theory of Miller and Modigliani (1961) in determining the optimal dividend policy through introducing information asymmetry in light of Myers and Majluf (1984) and Jensen (1986). Miller and Modigliani (1961) theorize that dividend policy is irrelevant under certain assumptions, mainly the assumption that all information in publicly available. However, such assumptions do not hold in a corporate world that suffers from asymmetric information, which suggests that the dividend policy is a relevant financial decision to the firm under information asymmetry (Felimban et al., 2018).

The financial economics literature selects information asymmetry as a major factor in determining the behavior of dividend policy (Allen and Michaely, 2003; DeAngelo et al., 2008). Hail et al. (2014) claim that an environment with rich information and good corporate governance relieves part of the information asymmetry between managers and investors, which, in turn, affects dividends. The agency theory predicts that managers would expropriate shareholders' wealth when information asymmetry is high and investors' scrutiny is limited (Jensen, 1986), i.e., the moral hazard problem. Therefore, if the enactment of SOX adoption mitigates information asymmetry and partially solves the moral hazard problem, investors are more capable of monitoring managers who are expected to increase dividend payments rather than benefiting privately through incurring excessive operating expenses. Moreover, the pecking order theory posits that, under high information asymmetry, managers prefer to finance ongoing and potential investments from internally generated funds because external financing is too costly. Specifically, when outside investors have minimal information about the fundamental value of the firm, they would underprice offered equity and require high interest rates on the offered debt. Outside investors believe that managers are selling them overpriced securities, and therefore, they undo this effect by discounting the offered securities to reach a Nash equilibrium (Shivakumar, 2000). Accordingly, managers prefer to retain the generated profits inside the firm instead of paying them because of the high costs associated with external financing. As a result, if SOX mitigates information asymmetry, then external financing should be less costly, and therefore, managers are expected to pay more dividends. In light of the preceding discussion, we formulate the hypothesis below.

Hypothesis 2: *Dividend payments decrease following the enactment of the SOX act.*

4. Research Methodology

As mentioned earlier, to identify the treatment effect of the SOX act on the level of information asymmetry, and accordingly, on dividend payments, we utilize a difference-in-differences methodology (Bargeron et al., 2010; Chemin and Sayour, 2016; Kang and Kim, 2010; Sayour, 2019). In doing so, we assign all US public firms that were exposed to the SOX act to the treatment group and all publicly listed UK firms to the control group. The similarity between both capital markets in terms of their institutional settings and enforcement of laws makes UK firms a suitable control group for US firms (Ball et al., 2000). We exclude the year 2002 from the analysis as it is a transitory year (Hong et al., 2014), especially that the SOX act was enacted in August 2002 and more than 90% of US firms report their financial statements by the end of the calendar year. As such, we expect to find a change in information asymmetry and dividend payments among the US firms following the SOX act, compared to the change in the same variables among UK firms.

4.1. Modelling information asymmetry

The regression equation below is an OLS regression that uses a difference-in-differences design. The equation tests the effect of the SOX act on information asymmetry in the US (treatment group) compared to that in the UK (control group).[1] Our empirical model is based on prior studies that use information asymmetry as a dependent variable (Fu et al., 2012; Muller et al., 2011).

$$Log\ (Info\ Asymmetry) = \beta_0 + \beta_1 SOX + \beta_2 Treatment + \beta_3 SOX \times Treatment + \sum Controls + \varepsilon \qquad (1)$$

Our dependent variable *Log (Info Asymmetry)* is a proxy for information asymmetry. Following prior studies, we measure information asymmetry on yearly basis as the median of daily bid-ask spread (Gregoriou, 2013; Muller et al., 2011).[2] The variable *SOX* is included in Equation (1) as a dummy variable that takes the value 1 if the year is greater than 2002 and zero if the year is less than 2002. The year 2002 is a transitory year that prior studies exclude (e.g., Harakeh et al., 2019). The variable *Treatment* is a dummy variable that takes the value 1 if the firm is listed in the US, and zero if the firm is listed in the UK. The interaction between *SOX* and *Treatment*, *SOX×Treatment*, is the difference-in-differences variable of interest. It isolates firms in the US after the SOX enactment. In order for H_1 to hold, we should observe a negative and significant β_3, which indicates a reduction in the level of information asymmetry in the US following the SOX act as compared to the UK.

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[1] Our results hold when we use firm fixed effects instead of OLS regressions; yet, we report results from OLS regressions as we think that the coefficient on *Treatment* is interesting (which is dropped when using firm fixed effects). The variable *Treatment* captures the difference in the dependent variable between both groups pre-SOX.
[2] The use of an alternative measure to the bid-ask spread (such as the Amihud [2002] illiquidity measure) yields qualitatively similar results.

Our control variables include a vector of variables that determine information asymmetry. Equation (1) controls for firm size, financial leverage, and Tobin's Q, which measures firm investment opportunities (Fama and French, 2002). The reason we include these variables is that firms with higher levels of information asymmetry tend to be small firms, with high financial leverage, and high investment opportunities (LaFond and Watts, 2008; Smith and Watts, 1992). We also include control variables such as stock price, trading volume, and return volatility. Prior studies show that firms with higher levels of information asymmetry have a smaller stock price, lower trading volume, and higher return volatility (Daske et al., 2008). All variables are defined in Appendix 1.

4.2. Modelling dividend payment

The regression equation below, Equation (2), is an OLS regression that uses a difference-in-differences design to test changes in the average dividend payment among US firms as compared to UK firms following the SOX enactment.

$$Dividends = \Omega_0 + \Omega_1 SOX + \Omega_2 Treatment + \Omega_3 SOX \times Treatment + \sum Controls + \varepsilon \qquad (2)$$

The dependent variable in Equation (2) is the total amount of cash paid as dividends, deflated by lagged total assets (Hail et al., 2014; Harakeh et al., 2019). In order for H_2 to hold, we should observe a positive and significant Ω_3, which indicates that the average dividend payment among US firms increased following SOX relative to that among UK firms.

Control variables include firm-specific variables that determine the dividend policy, as discussed in Fama and French (2001, 2002). Specifically, we control for firm size, investment opportunities, tangibility, financial leverage, investment activities, cashflow from operations, cash liquidity, and a dummy variable for loss-making firms. Essentially, dividend payers are usually more mature firms with lower investment opportunities. Moreover, more tangible firms pay higher dividends while more leveraged firms pay lower dividends due to more financial commitments. This is the case in firms that invest more aggressively, where such firms pay lower dividends to be able to finance their projects. Finally, firms with better cash liquidity pay more dividends, and usually such firms are more profitable. Thus, loss-making firms pay lower dividends. All variables are defined in Appendix 1.

5. Sample and Descriptive Statistics

5.1 Sample selection

We download financial data from the Compustat Global fundamental annual file and stock return data from the Compustat Global security file spanning the period 1997-2007. First, we drop all firms without enough annual financial data and daily stock returns. Then, we require that each firm has at least one observation before and one observation after the SOX act (Roberts and Whited, 2013; Wang, 2010). Finally, we drop all observations in year 2002, the transitory year (Hong et al., 2014).[3] We end up with 34,453 firm-years, of which 27,236 belong to the treatment group and 7,217 belong to the control group. Table 1 Panel A below describes the procedure of our sample construction in details. Table 1 Panel B reports the sample distribution by year and industry. The observations are evenly distributed between years. The industry with the highest number of firms is the manufacturing industry followed by the services industry, while the industry with the lowest number of firms is the public administration industry followed by the agriculture industry.

[Insert Table 1 around here]

[3] Including year 2002 does not change our inferences. In addition, our results persist when restricting the sample to two years pre-SOX and two years post-SOX.

5.2 Descriptive statistics

Table 2 reports the summary statistics for the variables used in the regression models for the treatment and control groups, separately. While the mean value of information asymmetry appears to be similar between the two groups, the mean of dividend payments is higher in the UK than in the US. Also, US firms rely more on debt, as shown by the higher mean of leverage for the treatment group. The mean values of investments and investment opportunities are higher in the treatment group. Both groups report negative operating cash flows relative to sales. Firms operating in the UK appear to be more tangible than those operating in the US.

[Insert Table 2 around here]

Table 3 presents the correlation matrix between variables for both the treatment and control groups. The matrix shows that stock price and trading volume are negatively correlated with the level of information asymmetry whereas return volatility is positively correlated with it. This is consistent with prior studies such as Muller et al. (2011). Moreover, Panels A and B of Table 3 show that firm size, financial leverage, tangibility and operating cash flow are negatively correlated with the level of information asymmetry. In contrast, investments, investment opportunities, loss-making firms, and high cash hoardings are positively correlated with the level of information asymmetry. This univariate analysis is consistent across both groups which lends more support to our argument that the UK capital market is a fine control to that of the US.

[Insert Table 3 around here]

6. Results

In each of the main regression analyses in Tables 4 and 5, we first run the corresponding equation using the control and treatment groups separately, and then we run the difference-in-differences regression. Then, in Table 6, we run a subsample analysis using US firms to examine whether firms with higher information asymmetry *ex ante* benefited more following the SOX act. Finally, in Tables 7 and 8, we run two robustness tests that examine (i) whether the observed change in the dependent variables had begun before the enactment of the SOX act and (ii) whether the change in the dependent variables kicked off immediately after SOX.

6.1. Information asymmetry around SOX

Table 4 reports results of the regression analysis that tests the effect of SOX on the level of information asymmetry. The first two columns report the regression results of Equation (1) for the control and treatment groups, respectively, while the third column reports the difference-in-differences regression results. Regarding the control variables, the coefficient on *Firm Size* shows that firm size (and maturity) affects negatively information asymmetry whereas financial leverage appears to be positively associated with the level of information asymmetry. Investment opportunities show a different effect on information asymmetry across the treatment and control groups, where a firm's investment opportunity set is positively (negatively) associated with information asymmetry among the control (treatment) firms. Also, the negative and significant coefficient on *Log (Volatility)* shows that stock return volatility is positively associated with information asymmetry while the stock price value seems to be negatively associated with information asymmetry.

As far as the variables of interest are concerned, the coefficient on SOX in the first column is -0.1057 whereas the same coefficient in the second column is -0.2389, both significant at the 1% level. This suggests that the level of information asymmetry following the year 2002 has dropped by 10% among UK firms as compared to a greater drop of 24% among US firms. The significant decrease in information asymmetry among UK firms can be attributed to the ongoing improvements in corporate governance (e.g., Al-Shaer and Harakeh, 2019), which is a main reason behind selecting the difference-in-differences design as our identification strategy. More importantly, we find a negative and significant coefficient on the interaction term *SOX×Treatment*, which indicates that the difference-in-differences effect on information asymmetry is around 17%, significant at the 1% level. This suggests that the level of information asymmetry among US firms has decreased significantly following the SOX act relative to the reduction in information asymmetry among UK firms. As such, we find empirical support for the hypothesis H_1.

[Insert Table 4 around here]

6.2. Dividend payments around SOX

After examining the change in the level of information asymmetry following SOX, we now examine the change in dividend payments that is triggered by the change in information asymmetry. The first two columns in Table 5 report the regression results of Equation (2) for the control and treatment groups, respectively, while the third column reports the difference-in-differences regression results. Regarding the control variables, the results show that bigger firms pay higher dividends (positive and significant coefficient on *Firm Size*) and that investments are negatively associated with dividend payments (negative and significant coefficient on *Investments*). Moreover, the results show that higher financial leverage is associated with lower dividend payments whereas firms with higher operating cashflows pay more dividends. The results are consistent with prior findings of Denis and Osobov (2008) who also find that loss-making firms pay less dividends, which is also indicated by the negative and significant coefficient on *Loss Dummy* in Table 5.

Considering the variables of interest, we find that the coefficient on SOX in the first column is -0.0012, where the coefficient is statistically insignificant, indicating no significant change in the level of dividend payments among UK firms. On the other hand, the coefficient on SOX in the second column is 0.0025, significant at the 1% level, which indicates that the level of dividend payments increased significantly following the SOX act. As a matter of fact, the average of *Dividends* for the treatment group (US firms) as reported in Table 2 is 0.0088, and therefore, an increase by 0.0025 corresponds to a reduction by 28.4% (i.e., indicating an economic significance). These two coefficients yield a positive and highly significant difference-in-differences coefficient on the interaction variable *SOX×Treatment* as shown in the third column of Table 5. This suggests that the level of dividend payments has increased significantly following the SOX act among US firms compared to that among UK firms.[4] As such, the results support the hypothesis H_2.

[Insert Table 5 around here]

6.3. Subsample analysis

To gain more confidence in attributing the increase in dividend payments to the enactment of SOX through the channel of decreasing information asymmetry, we perform a subsample analysis in which we split the US sample into high and low information asymmetry subsamples. We first calculate the average of information asymmetry for each firm in the pre-SOX years. We then assign each US firm to the high information asymmetry subsample (high IA) if its average of information asymmetry in the pre-SOX era is larger than the median of the whole US sample. The firm is assigned to the low information asymmetry subsample (low IA) if the its average of information asymmetry is lower than the median of the whole US sample. Table 6 reports the results of two sets of regressions that examine the effect of SOX on information asymmetry and dividend payments, respectively, using the two subsamples.

[4] In an additional analysis, we examine how investing activities are affected following SOX given that a bigger portion of earnings is paid out as dividends. We find that investing activities decrease among US firms relative to UK firms. It might be the case that the enactment of SOX curbs managerial discretion over investing activities, i.e., limit overinvesting activities which are destructive to the shareholders' value (Biddle et al., 2009).

The first set of regressions is based on Equation (1). The results in the first two columns of Table 6 show that the reduction in information asymmetry for the low IA subsample is 20%, compared to a reduction of 28% for the high IA subsample, as indicated by the coefficient on *SOX*. This result suggests that, following the enactment of SOX, firms in the high IA subsample witness, on average, around 40% greater reduction in information asymmetry compared to firms in the low IA subsample. This difference in the reduction is statistically significant with a Chi^2 of 65.40 and a *p*-value of zero.

The second set of regressions is based on Equation (2), also using the high IA and low IA subsamples. The first column of second set of regressions in Table 6 corresponds to the low IA subsample, where the coefficient on *SOX* is 0.0020, significant at the 1% level (t-stat = 6.39). The second column refers to the high IA subsample, where the coefficient on *SOX* is 0.0039, also significant at the 1% level (t-stat = 7.78). Comparing both coefficients, economically and statistically, we conclude that firms with high information asymmetry in the pre-SOX years increased their dividend payments more compared to firms with relatively low information asymmetry. The Chi^2 statistic confirms the significant difference between the coefficients on *SOX* in both regressions (*p*-value of zero). The results in Table 6 makes us more confident in attributing the increase in dividend payments after the SOX enactment to the lower level of information asymmetry following the act.

[Insert Table 6 around here]

6.4. Robustness tests

A major assumption of the difference-in-differences design is the common time trend between the control and treatment groups before the enactment of the policy. That is, if the treatment group was not treated, it would have evolved the same way as the control group. One way to test this assumption is to assume that the treatment happened before the true treatment date (i.e., before 2002) and show that the difference-in-differences estimator yields an insignificant coefficient, which gives support to the common time trend assumption. In this context, the first sensitivity analysis we perform checks whether the change in the dependent variables had begun before the SOX enactment. In doing so, we keep observations in the pre-SOX period and create a pseudo SOX dummy variable that takes the value 1 for years 1999-2001 and zero for the years 1997 and 1998.[5] We expect an insignificant coefficient on the difference-in-differences estimator in Equations (1) and (2) when using *Pseudo SOX*, indicating a common time trend between both samples. As reported in Table 7, the coefficient on the interaction variable *Pseudo SOX* × *Treatment* is insignificant in both regressions, in which we use information asymmetry and dividends as dependent variables, indicating that the change did not take place prior to 2002. This ensures that the findings in Table 4 and Table 5 are not random and due to change in firms' economics, but due to and are attributed to the enactment of the SOX act (Luez, 2003).

[Insert Table 7 around here]

The other robustness test we perform examines whether the effect of the SOX enactment kicked off right away. To do so, we first create a dummy variable for each year in the post-SOX period, and then interact the variable *Treatment* with all post-SOX year dummies. We expect to find a significant coefficient on the *Year*×*Treatment* interaction term where SOX took effect. As shown in the first regression of Table 8, which uses *Log (Info. Asymmetry)* as the dependent variable, the interaction variables are all negative and highly significant, which indicates that the SOX act had a direct negative impact on information asymmetry (the effect on information

[5] Our inference remains unchanged when using other pseudo years.

asymmetry is evident in the year 2003, right after the enactment). The second regression in Table 8 uses *Dividends* as the dependent variable. The positive and significant coefficients on the interaction variables indicate that the effect of the SOX act on dividend payments also kicked off directly. In conclusion to this section, the additional tests that we performed lend more support to our argument that the average dividend payment among US firms increased due to the reduction in the level of the information asymmetry following the enactment of the SOX act in 2002 and that the effect of the policy kicked off immediately.

[Insert Table 8 around here]

6.5. Additional analyses

In this subsection we consider some methodological variations by which we examine whether and how our findings vary. We first repeat our main analysis using a different control group, namely, Canada. Then, we extend the sample period until 2012 to examine whether the effect of SOX persists during the global financial crisis that took place in the US in 2008 and affected most of (developed) economies worldwide.

A natural choice of a suitable control group for the US is Canada, which has similar economic and institutional characteristics, despite the significant difference in the size of the two economies. Yet, we chose the UK as we believe that the enactment of the SOX act will have an indirect effect on the Canadian capital market, which renders Canada a 'contaminated' control group. Nevertheless, we replicate our main results using Canada instead of the UK as a control group. Table 9 reports the difference-in-differences regressions of Equations (1) and (2), in which we replace the variable *Treatment* by the variable *Treatment_C* that takes the value 1 if the firm is listed in the US and zero if the firm is listed in Canada. The results of the first regression are consistent with those reported in Table 4 as they show that the level of information asymmetry declined significantly in the US relative to the decline in Canada following SOX. Similarly, the results of the other regression are highly consistent with the results reported in Table 5 as they show that the average dividend payment among US firms increased significantly following SOX relative to that among Canadian firms. These findings support hypotheses H1 and H2.

[Insert Table 9 around here]

In the second additional analysis, we extend the sample period to test whether the effect of the SOX act on information asymmetry, and accordingly, on dividend payments changes following the 2008 global financial crisis. The financial crisis originated in the US by the end of 2007, and exacerbated in 2008, due to the meltdown of the subprime mortgages and the associated financial securities (Balakrishnan et al., 2016). The crisis caused a sharp decline in liquidity in banks and financial institutions, which caused a severe scarcity of financial resources.[6] This crisis affected most of the (developed) economies worldwide, especially in Europe, as the near collapse of the banking sector caused the greatest economic contraction in the US and the UK since the end of World War II (Barth and Landsman, 2010). Accordingly, our difference-in-differences methodology assumes a similar impact for the global financial crisis in both countries. To empirically model the effect of the financial crisis, we extend the sample period until 2012 and run the following regressions:

$$Log\ (Info\ Asymmetry) = \gamma_0 + \gamma_1 Treatment + \gamma_2 Post1 + \gamma_3 Post2$$

[6] Two years later, the US witnessed an emerging debt crisis due to a political clash between the Democrats and the Republicans. Both parties wanted to curb the national debt; however, the former party wanted to increase taxes on wealthy people while the latter party favored cutting on governmental spending. In April 2011, the government almost shut down as the Congress delayed the approval of the annual budget. This event is known as the "sovereign debt crisis", which is also captured in our extended sample period. Such events may result in governments not paying their debt to lenders, who are usually banks. Accordingly, the capital market will suffer a credit crunch due to the scarcity of liquidity in banks (Acharya et al., 2018). As such, the financial crisis and the sovereign debt crisis have similar effects on corporate financing decisions.

$$+ \gamma_4 Post1 \times Treatment + \gamma_5 Post2 \times Treatment + \sum Controls + \varepsilon \qquad (3)$$

$$Dividends = \delta_0 + \delta_1 Treatment + \delta_2 Post1 + \delta_3 Post2$$

$$+ \delta_4 Post1 \times Treatment + \delta_5 Post2 \times Treatment + \sum Controls + \varepsilon \qquad (4)$$

Where *Treatment* is a dummy variable that is equal to 1 if the firm is listed in the US, and 0 if the firm is listed in the UK; similar to Equations (1) and (2). *Post1* is a dummy variable that is equal to 1 for the years 2003 until 2007, it captures the period following the SOX implementation. *Post2* is a dummy variable that is equal to 1 for the years 2008 until 2012 and captures the financial crisis. *Post1×Treatment* isolates firms in the US in the period following the SOX implementation and *Post2×Treatment* isolates firms in the US in the financial crisis period. The coefficients of *Post1×Treatment* compare firms in the US before and after the implementation of SOX relative to those in the UK and thus capture the effect of SOX on information asymmetry (Equation 3) and dividend payments (Equation 4). The coefficients of *Post2×Treatment* compare information asymmetry and dividend payments in US firms relative to UK firms in the financial crisis period relative to the period preceding SOX implementation. As such, the interaction term *Post2×Treatment* determines the effect of SOX during the financial crisis. To determine if the effect of the SOX act on information asymmetry and dividend payments changed during the financial crisis period (2008-2012) relative to the period directly following SOX implementation (2003-2007), we test whether the coefficients of *Treatment×Post1* and *Treatment×Post2* are significantly different. The results are reported in Table 10.

The first regression in Table 10 refers to the test of information asymmetry (H1) and the other regression refers to the test of dividend payments. Regarding the first regression, the results are consistent with the findings of Table 4. The coefficient on the interaction term

Post1×Treatment, which captures the percentage change in information asymmetry in the US compared to the UK following the SOX act, is −0.1634 and significant at the 1% level. Similarly, the coefficient on the interaction term, *Post2×Treatment*, which captures the percentage change in information asymmetry in the US compared to the UK following the financial crisis, is −0.1393 and significant at the 1% level. Despite that the SOX era witnessed around 2.4% greater reduction in asymmetric information, the difference between both coefficients is statistically insignificant (t-stat = −1.32). This finding suggests that the reduction in information asymmetry following SOX continued to persist when the financial crisis struck. The results in the second regression of Table 10, which tests the change in dividend payments, show a similar trend. The second regression in Table 10 shows that the coefficient on the interaction term *Post1×Treatment*, which captures the change in the average dividend payment in the US compared to the UK following the SOX act, is 0.0054 and significant at the 1% level. Similarly, the coefficient on the interaction term, *Post2×Treatment*, which captures the change in the average dividend payment in the US compared to the UK following the financial crisis, is 0.004 and significant at the 1% level. The difference between both coefficients is statistically insignificant (t-stat = 1.18). This finding suggests that the increase in dividend payments following SOX persists following the financial crisis.

[Insert Table 10 around here]

Overall, our results indicate significant economic consequences of the SOX act. They show that the government intervention following a series of financial reporting scandals was successful in protecting investors. This intervention resulted in mitigating information asymmetry, and accordingly, increasing dividend payments. Under low levels of information asymmetry (i.e., higher transparency), investors can make better investing decisions, which yields more investment efficiency in the capital market. In other words, the allocation of capital is expected to become more efficient as the capital market participants will be able to identify the good companies to invest in. Providing capital to ethical and well-performing companies should contribute in economic prosperity. Moreover, increasing the level of dividend payments can be perceived as a tool to mitigate overinvesting activities (Biddle et al., 2009) in which managers adopt aggressive investing strategies for personal benefits. When investors are more capable of monitoring managerial activities due to low information asymmetry, managers with excess free cash flow will be obliged to pay dividends rather than invest in value-destroying projects. Constraining overinvesting activities is also expected to improve the allocation of capital in the market, and accordingly, foster economic growth at the macro level.

7. Conclusions

In this paper, we use the enactment of the SOX act in the US in 2002 as an exogenous variation in the level of information asymmetry among US public firms to examine an endogeneity-free relationship between dividend policy and information asymmetry. The agency theory and the pecking order theory predict that the conflicts over the dividend policy exacerbate when information asymmetry increases (Jensen, 1986; Myers and Majluf, 1984). As such, to the extent that the SOX act is supposed to enhance the information environment of firms and improve their corporate governance, we expect a reduction in the level of asymmetric information between managers and shareholders. A reduction in information asymmetry is supposed to enhance the monitoring capabilities of investors (agency theory) and facilitate external financing of investments by managers (pecking order theory), and accordingly, we expect managers to retain less cash inside their firms and increase dividend payments.

We test these hypotheses using a difference-in-differences methodology where the US firms form the treatment group while the UK firms form the control group. We select the UK as the control group because SOX only affected the US capital market and due to the similarity of other factors that might affect the relationship between dividends and information asymmetry between both countries. The results show that, following the enactment of SOX, the level of asymmetric information decreased significantly, and this was accompanied with an increase in dividend payments among US firms relative to UK firms. Furthermore, we perform a subsample analysis in which we find that firms with higher information asymmetry in the pre-SOX period witness a greater reduction in the level of asymmetric information, and accordingly, increase their dividend payments more post-SOX. This finding makes us more confident in attributing the increase in dividend payments to the reduction in information asymmetry. Finally, we also provide evidence that the common time trend assumption holds in our dataset for the dependent variables prior to SOX. We also show that the SOX act influenced the dependent variables immediately after its enactment. It is worth mentioning that our methodology has some room for development. Despite that our difference-in-differences methodology mitigates bias concerns, future research can still employ alternative methods, such as the Improved Augmented Regression Method (Kim, 2014; Tsagkanos, 2017), to test whether the efficiency of the coefficient estimates can be improved further in a time-series modelling context given the small number of years in our sample.

This paper contributes to the longstanding literature of financial economics that tackles the relationship between information asymmetry and dividend policy while utilizing an exogenous variation in the level of asymmetric information. The main conclusion of this study is that lower levels of asymmetric information reduce the tension between managers and investors and resolve conflicts over financing decisions. Our results might be of interest to policy makers who strive to minimize costs of financial transactions in capital markets and protect shareholders.

Lastly, in our paper, we are interested not only in testing the relationship between information asymmetry and dividends around the SOX implementation, but also in providing an empirical evaluation of the effects of the SOX policy on information asymmetry and dividends. Future research might consider studying the long run relationship between information asymmetry and dividends which is of high interest to policy makers, investors, and academics. In addition, in our paper, we do not model non-linearities. An interesting extension would be to try to allow for non-linearities using a threshold cointegration as in Tsagkanos et al. (2019) and Tsagkanos and Siriopoulos (2015).

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Appendix 1: Variable Definitions

Variable (sorted)	**Definition**
Cash	Total cash balance, scaled by total assets at the end of year t−1.
Dividends	Common dividends declared year t, scaled by total assets at the end of year t−1.
Firm Size	Natural logarithm of total assets.
Investments	Sum of research and development expenditure, capital expenditure, and acquisition expenditure less cash receipts from sale of property, plant, and equipment at the end of year t, scaled by total assets at the end of year t−1.
Leverage	Ratio of long-term debt to the sum of long-term debt and market value of equity at the end of year t−1.
Log (Info. Asymmetry)	Natural logarithm of the median of daily percentage bid-ask spread in year t, calculated the ask price minus the bid price, divided by the average of bid and ask prices.
Log (Price)	Natural logarithm of stock price.
Log (Trading Volume)	Natural logarithm of the mean of daily percentage common shares traded divided by common shares outstanding.
Log (Volatility)	Natural logarithm of the standard deviation of stock returns in year t.
Loss	Dummy variable that takes the value 1 if net income at the end of year t−1 is negative, and zero otherwise.
Operating Cashflow	Cash flow from operations to sales at the end of year t−1.
Pseudo SOX	Dummy variable that takes the value 1 for the years between 1999 and 2001, and zero for the years 1997 and 1998.
SOX	Dummy variable that takes the value 1 if the year is more than 2002, and zero otherwise.
Tangibility	Property, plant, and equipment, scaled by total assets at the end of year t−1.
Tobin's Q	Sum of liabilities and market value of equity, scaled by total assets at the end of year t−1.
Treatment	Dummy variable that takes the value 1 for firms listed in the US, and zero otherwise.

Tables:

Table 1: Sample Distribution

Panel A: Sample construction	
All firm-years	74586
Less:	
Firm-years with missing financial variables and daily stock prices	(24923)
Firm-years for firms that do not appear at least once before and once after SOX	(11204)
Firm-years in 2002 (transitory year)	(4006)
Final sample (firm-years)	34453

Panel B: Sample distribution by industry and year

General Industry Classification	1997	1998	1999	2000	2001	2003	2004	2005	2006	2007	Total
Agriculture	11	15	15	19	19	18	16	15	15	13	156
Mining and construction	171	186	209	220	230	230	218	207	197	180	2048
Manufacturing	1339	1433	1510	1623	1772	1765	1685	1604	1501	1389	15621
Transportation	272	279	296	321	352	352	341	317	298	271	3099
Retail	323	360	383	431	456	454	428	396	370	342	3943
Financials	174	187	211	239	247	238	220	204	181	184	2085
Services	467	562	639	796	942	941	873	810	731	654	7415
Public Administration	7	7	8	9	10	10	9	9	9	8	86
Total	2764	3029	3271	3658	4028	4008	3790	3562	3302	3041	34453

Notes: Panel A of this table describes the procedure of the sample construction. Panel B of this table reports the sample distribution by industry and year.

Table 2: Summary statistics

	Treatment group						Control group					
	N	Mean	S.D.	Q1	Median	Q3	N	Mean	S.D.	Q1	Median	Q3
Log (Info. Asymmetry)	27236	-3.2340	0.5452	-3.6173	-3.2637	-2.8497	7217	-3.2231	0.6822	-3.7001	-3.2849	-2.7764
Log (Volatility)	27236	-3.3475	0.7063	-3.7974	-3.4182	-3.0225	7217	-3.3534	1.0919	-4.0420	-3.6462	-3.1051
Log (Price)	27236	2.5564	1.1942	1.8520	2.7726	3.4409	7217	0.1202	1.5331	-0.8324	0.3716	1.2669
Log (Trading Volume)	27236	11.6351	1.9568	10.2782	11.7608	13.0228	7217	12.2079	1.8778	10.9077	12.0774	13.5031
Dividends	27236	0.0088	0.0203	0.0000	0.0000	0.0096	7217	0.0262	0.0286	0.0000	0.0207	0.0396
Firm Size	27236	5.6906	2.0623	4.2077	5.6089	7.0572	7217	4.5666	2.0900	3.0683	4.3239	5.8664
Tobin's Q	27236	2.2996	2.3166	1.1561	1.5772	2.4954	7217	2.0124	2.0125	1.0593	1.4121	2.1114
Tangibility	27236	0.2635	0.2333	0.0783	0.1882	0.3853	7217	0.3064	0.2488	0.0975	0.2486	0.4518
Leverage	27236	0.1614	0.1976	0.0007	0.0813	0.2609	7217	0.1312	0.1623	0.0010	0.0654	0.2123
Investments	27236	0.1687	0.1991	0.0494	0.1073	0.2096	7217	0.1058	0.1463	0.0281	0.0620	0.1225
Operating Cashflow	27236	-0.1868	1.6484	0.0145	0.0794	0.1518	7217	-0.1246	1.4044	0.0231	0.0853	0.1602
Loss Dummy	27236	0.2817	0.4498	0.0000	0.0000	1.0000	7217	0.2792	0.4486	0.0000	0.0000	1.0000
Cash	27236	0.1276	0.1557	0.0194	0.0673	0.1755	7217	0.1170	0.1511	0.0200	0.0598	0.1496

Notes: This table reports the summary statistics for all the variables used in the main analysis for the treatment and control group, separately.

Table 3: Correlation Matrix

Panel A: Treatment group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Log (Info. Asymmetry) (1)	1												
Log (Volatility) (2)	0.655*	1											
Log (Price) (3)	-0.613*	-0.435*	1										
Log (Trading Volume) (4)	-0.066*	-0.094*	0.3585	1									
Dividends (5)	-0.338*	-0.235*	0.251*	0.008	1								
Firm Size (6)	-0.556*	-0.340*	0.6314	0.636*	0.182*	1							
Tobin's Q (7)	0.217*	0.133*	0.0474	0.205*	0.030*	-0.184*	1						
Tangibility (8)	-0.177*	-0.113*	0.1109	-0.058*	0.115*	0.176*	-0.165*	1					
Leverage (9)	-0.135*	-0.001	-0.0354	-0.087*	-0.062*	0.292*	-0.325*	0.347*	1				
Investments (10)	0.218*	0.132*	-0.0148	0.098*	-0.115*	-0.209*	0.327*	0.031*	-0.202*	1			
Operating Cashflow (11)	-0.211*	-0.146*	0.1930	-0.008	0.096*	0.209*	-0.197*	0.117*	0.091*	-0.235*	1		
Loss Dummy (12)	0.435*	0.312*	-0.4387	-0.015*	-0.224*	-0.294*	0.103*	-0.115*	0.016*	0.130*	-0.302*	1	
Cash (13)	0.303*	0.178*	-0.192*	0.066*	-0.086*	-0.341*	0.362*	-0.348*	-0.375*	0.254*	-0.280*	0.238*	1

Panel B: Control group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Log (Info. Asymmetry) (1)	1												
Log (Volatility) (2)	0.239*	1											
Log (Price) (3)	-0.684*	-0.136*	1										
Log (Trading Volume) (4)	-0.010	0.154*	0.0736	1									
Dividends (5)	-0.386*	-0.141*	0.460*	0.034*	1								
Firm Size (6)	-0.438*	0.037*	0.594*	0.641*	0.231*	1							
Tobin's Q (7)	0.075*	0.024*	0.082*	0.085*	0.116*	-0.181*	1						
Tangibility (8)	-0.130*	-0.008	0.160*	0.007	0.046*	0.252*	-0.184*	1					
Leverage (9)	-0.019	0.084*	-0.001	0.138*	-0.155*	0.318*	-0.264*	0.354*	1				
Investments (10)	-0.014	0.008	0.106*	0.068*	0.008	-0.061*	0.293*	0.052*	-0.114*	1			
Operating Cashflow (11)	-0.186*	-0.072*	0.190*	-0.016	0.172*	0.197*	-0.155*	0.155*	0.114*	-0.108*	1		
Loss Dummy (12)	0.442*	0.157*	-0.498*	0.018	-0.414*	-0.333*	0.079*	-0.148*	0.005	0.034*	-0.280*	1	
Cash (13)	0.136*	0.028*	-0.112*	-0.061*	-0.048*	-0.300*	0.285*	-0.348*	-0.308*	0.141*	-0.303*	0.179*	1

Notes: This table reports the correlation matrices for all the variables used in the main analysis for the treatment and control groups, separately.

Table 4: The effect of SOX enactment on information asymmetry

	Control group	**Treatment group**	**Diff-in-Diff**
Dependent variable:	*Log (Info. Asymmetry)*	*Log (Info. Asymmetry)*	*Log (Info. Asymmetry)*
SOX	-0.1057***	-0.2389***	-0.0884***
	[-6.06]	[-30.26]	[-4.85]
Treatment			0.6731***
			[34.57]
SOX × Treatment			-0.1672***
			[-9.11]
Firm Size	-0.0361***	-0.1501***	-0.1401***
	[-3.77]	[-32.54]	[-36.07]
Tobin's Q	0.0276***	-0.0065***	-0.0005
	[6.26]	[-4.77]	[-0.38]
Leverage	0.1094*	0.1549***	0.1474***
	[1.93]	[6.89]	[6.91]
Log (Volatility)	0.0823***	0.2682***	0.1817***
	[8.18]	[17.36]	[18.37]
Log (Price)	-0.2717***	-0.1142***	-0.1544***
	[-30.12]	[-28.02]	[-39.45]
Log (Trading Volume)	0.0253***	0.1310***	0.1212***
	[3.19]	[33.37]	[35.14]
Intercept	-3.0134***	-2.8001***	-3.3862***
	[-26.25]	[-9.63]	[-34.12]
Industry Fixed Effects	Included	Included	Included
Adj. R^2	0.5183	0.7239	0.6391
N	7217	27236	34453

Notes: This table reports the OLS regression results for Equation (1) using the control sample, treatment sample, and the full sample, respectively. The dependent variable is the natural logarithm of the bid-ask spread, which is a proxy for information asymmetry. All regression includes industry fixed effects based on the SIC one-digit code. All standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 5: The effect of SOX enactment on dividend payments

	Control group	Treatment group	Diff-in-Diff
Dependent variable:	*Dividends*	*Dividends*	*Dividends*
SOX	-0.0012	0.0025***	-0.0212***
	[-1.65]	[7.82]	[-23.95]
Treatment			-0.0032***
			[-4.41]
SOX × Treatment			0.0056***
			[7.44]
Firm Size	0.0024***	0.0011***	0.0014***
	[6.90]	[5.86]	[8.23]
Tobin Q	0.0021***	0.0008***	0.0010***
	[5.28]	[4.90]	[6.53]
Tangibility	0.0025	0.0135***	0.0107***
	[1.11]	[8.51]	[8.01]
Leverage	-0.0340***	-0.0159***	-0.0178***
	[-11.79]	[-13.42]	[-15.69]
Investments	-0.0054*	-0.0118***	-0.0101***
	[-1.67]	[-10.39]	[-9.31]
Operating Cashflow	0.0018***	0.0004***	0.0006***
	[7.43]	[4.52]	[6.62]
Loss Dummy	-0.0208***	-0.0070***	-0.0100***
	[-21.05]	[-16.83]	[-24.45]
Cash	0.0036	-0.0013	0.0001
	[0.85]	[-0.82]	[0.05]
Intercept	0.0129***	-0.0037	0.0182***
	[3.28]	[-1.52]	[5.92]
Industry Fixed Effects	Included	Included	Included
Adj. R^2	0.266	0.1316	0.2228
N	7217	27236	34453

Notes: This table reports the OLS regression results for Equation (2) using the control sample, treatment sample, and the full sample, respectively. The dependent variable is the dividend payment. All regressions include industry fixed effects based on the SIC one-digit code. All standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 6: The effect of SOX enactment for low and high IA subsamples

	Low IA	High IA		Low IA	High IA
Dependent variable:	*Log(Info. Asymmetry)*	*Log(Info. Asymmetry)*	Dependent variable:	*Dividends*	*Dividends*
SOX	-0.2065***	-0.2802***	*SOX*	0.0020***	0.0039***
	[-21.68]	[-25.91]		[6.39]	[7.78]
Firm Size	-0.1596***	-0.0751***	*Firm Size*	0.0003	0.0002
	[-25.40]	[-15.04]		[0.85]	[1.05]
Tobin Q	-0.0263***	-0.0015	*Tobin Q*	0.0057***	0.0001**
	[-5.67]	[-1.53]		[6.98]	[2.37]
Leverage	0.1674***	0.0908***	*Tangibility*	0.0121***	0.0030**
	[5.36]	[4.25]		[5.65]	[2.50]
Log (Volatility)	0.1726***	0.3369***	*Leverage*	-0.0142***	-0.0040***
	[10.70]	[18.86]		[-6.16]	[-4.67]
Log (Price)	-0.0830***	-0.0878***	*Investments*	-0.0199***	-0.0037***
	[-10.54]	[-21.70]		[-8.28]	[-6.77]
Log (Trading Volume)	0.1482***	0.0618***	*Operating Cashflow*	0.0057***	0.0001
	[24.70]	[14.06]		[3.27]	[0.04]
Intercept	-3.2355***	-1.9048***	*Loss Dummy*	-0.0066***	-0.0030***
	[-47.23]	[-28.31]		[-10.54]	[-8.96]
			Cash	0.005	0.0007
				[0.88]	[0.73]
			Intercept	0.0025	0.0020**
				[1.02]	[1.98]
Industry Fixed Effects	Included	Included	Industry Fixed Effects	Included	Included
H_0: *SOX* (Low IA) = *SOX* (High IA)	Chi^2 = 65.40; *p*-value = 0.000		H_0: *SOX* (Low IA) = *SOX* (High IA)	Chi^2 = 16.37; *p*-value = 0.000	
Adj. R2	0.463	0.7086	Adj. R2	0.1579	0.1329
N	13614	13622	N	13614	13622

Notes: This table reports the OLS regression results for Equations (1) and (2) using the low IA and high IA subsamples, respectively, within the US sample. Each US firm is assigned to the low (high) information asymmetry subsample if the mean value of the firm's information asymmetry in the pre-SOX period is lower (higher) than the median of the whole US sample. The dependent variable in the first set of regressions is the natural logarithm of the bid-ask spread, which is a proxy for information asymmetry. The dependent variable in the second set of regressions is the dividend payment. All regressions include industry fixed effects based on the SIC one-digit code. All standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 7: Falsification test

Dependent variable:	*Log (Info. Asymmetry)*	Dependent variable:	*Dividends*
Pseudo SOX	-0.0614**	*Pseudo SOX*	-0.0211***
	[-2.18]		[-18.29]
Treatment	0.7541***	*Treatment*	-0.0006
	[21.82]		[-0.68]
Pseudo SOX × Treatment	-0.031	*Pseudo SOX × Treatment*	-0.0008
	[-1.08]		[-0.89]
Firm Size	-0.1342***	*Firm Size*	0.0013***
	[-28.35]		[7.43]
Tobin's Q	0.0022	*Tobin's Q*	0.0006***
	[1.56]		[5.01]
Leverage	0.1376***	*Tangibility*	0.0093***
	[5.18]		[6.60]
Log (Volatility)	0.2193***	*Leverage*	-0.0159***
	[16.65]		[-12.66]
Log (Price)	-0.1713***	*Investments*	-0.0066***
	[-32.44]		[-6.46]
Log (Trading Volume)	0.1594***	*Operating Cashflow*	0.0005***
	[33.00]		[5.38]
Intercept	-3.6291***	*Loss Dummy*	-0.0087***
	[-22.90]		[-18.76]
		Cash	-0.0040**
			[-2.22]
		Intercept	0.0160***
			[5.26]
Industry Fixed Effects	Included	Industry Fixed Effects	Included
Adj. R^2	0.612	Adj. R2	0.2832
N	16750	N	16750

Notes: This table replicates the difference-in-differences regressions of Equations (1) and (2) while using a pseudo SOX dummy that takes the value of 1 for years 1999-2001 and zero for the years 1997 and 1998. The dependent variable in the first column is the natural logarithm of the bid-ask spread. The dependent variable in the second column is the dividend payment. All regressions include industry fixed effects based on the SIC one-digit code. All standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 8: Yearly Difference-in-differences results

Dependent variable:	*Log (Info. Asymmetry)*	*Dividends*
Treatment	0.6738***	-0.0212***
	[34.63]	[-23.90]
Year=2003 Dummy	-0.0817***	-0.0034***
	[-4.71]	[-4.98]
Year=2004 Dummy	-0.0904***	-0.0018**
	[-4.69]	[-2.44]
Year=2005 Dummy	-0.1076***	-0.0023***
	[-5.04]	[-2.65]
Year=2006 Dummy	-0.0833***	-0.0037***
	[-3.75]	[-3.52]
Year=2007 Dummy	-0.0777***	-0.0052***
	[-3.55]	[-4.80]
Treatment × Year=2003 Dummy	-0.0844***	0.0049***
	[-4.77]	[6.86]
Treatment × Year=2004 Dummy	-0.1615***	0.0040***
	[-8.39]	[4.94]
Treatment × Year=2005 Dummy	-0.1992***	0.0040***
	[-9.28]	[4.31]
Treatment × Year=2006 Dummy	-0.2337***	0.0071***
	[-10.27]	[6.23]
Treatment × Year=2007 Dummy	-0.1806***	0.0092***
	[-7.91]	[7.79]
Intercept	-3.4049***	0.0182***
	[-34.20]	[5.91]
Control Variables	Included	Included
Industry Fixed Effects	Included	Included
Adj. R^2	0.6428	0.2238
N	34453	34453

Notes: This table reports OLS regressions of Equations (1) and (2) while replacing *SOX* and its interaction with *Treatment* with the post-SOX year dummy variables and their interactions with *Treatment*. The dependent variable in the first column is the natural logarithm of the bid-ask spread. The dependent variable in the second column is the dividend payment. All regressions include industry fixed effects based on the SIC one-digit code. All standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 9: Using Canada as the control group

Dependent variable:	*Log (Info. Asymmetry)*	Dependent variable:	*Dividends*
SOX	0.1524***	*SOX*	-0.0024*
	[4.46]		[-1.87]
Treatment_C	-0.0661**	*Treatmen_C*	-0.0005
	[-2.08]		[-0.37]
SOX × Treatment_C	-0.1560***	*SOX × Treatment_C*	0.0032**
	[-4.92]		[2.32]
Firm Size	-0.1357***	*Firm Size*	0.0011***
	[-27.79]		[6.30]
Tobin's Q	-0.0024*	*Tobin's Q*	0.0008***
	[-1.77]		[5.18]
Leverage	0.1484***	*Tangibility*	0.0129***
	[6.26]		[8.53]
Log (Volatility)	0.2966***	*Leverage*	-0.0159***
	[18.58]		[-14.14]
Log (Price)	-0.1184***	*Investments*	-0.0111***
	[-27.53]		[-10.99]
Log (Trading Volume)	0.1152***	*Operating Cashflow*	0.0003***
	[27.53]		[4.55]
Intercept	-2.7763***	*Loss Dummy*	-0.0070***
	[-10.17]		[-17.64]
		Cash	-0.0012
			[-0.75]
		Intercept	-0.0004
			[-0.13]
Industry Fixed Effects	Included	Industry Fixed Effects	Included
Adj. R^2	0.7094	Adj. R2	0.1281
N	28279	N	28279

Notes: This table replicates the difference-in-differences regressions of Equations (1) and (2) while replacing the UK with Canada to serve as the control group. The Canadian control group is captured using the *Treatment_C* dummy variable. The dependent variable in the first column is the natural logarithm of the bid-ask spread. The dependent variable in the second column is the dividend payment. All regressions include industry fixed effects based on the SIC one-digit code. All standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 10: Extended sample period

Dependent variable:	*Log (Info. Asymmetry)*	Dependent variable:	*Dividends*
Post1	-0.0800***	*Post1*	-0.0028***
	[-4.40]		[-3.82]
Post2	0.0713***	*Post2*	0.0017
	[2.86]		[1.30]
Treatment	0.6340***	*Treatment*	-0.0208***
	[33.10]		[-23.26]
Post1 × Treatment	-0.1634***	*Post1 × Treatment*	0.0054***
	[-8.90]		[7.15]
Post2 × Treatment	-0.1393***	*Post2 × Treatment*	0.0040***
	[-5.39]		[2.88]
Firm Size	-0.1342***	*Firm Size*	0.0013***
	[-28.35]		[7.43]
Tobin's Q	0.0022	*Tobin's Q*	0.0006***
	[1.56]		[5.01]
Leverage	0.1376***	*Tangibility*	0.0093***
	[5.18]		[6.60]
Log (Volatility)	0.2193***	*Leverage*	-0.0159***
	[16.65]		[-12.66]
Log (Price)	-0.1713***	*Investments*	-0.0066***
	[-32.44]		[-6.46]
Log (Trading Volume)	0.1594***	*Operating Cashflow*	0.0005***
	[33.00]		[5.38]
Intercept	-3.6291***	*Loss Dummy*	-0.0087***
	[-22.90]		[-18.76]
		Cash	-0.0040**
			[-2.22]
		Intercept	0.0160***
			[5.26]
Industry Fixed Effects	Included	Industry Fixed Effects	Included
Adj. R^2	0.6212	Adj. R2	0.1873
N	46242	N	46242

Notes: This table replicates the difference-in-differences regressions of Equations (1) and (2) while using an extended sample period (1997-2012), where the additional period (2008-2012) is captured using the *Post2* dummy variable. The dependent variable in the first column is the natural logarithm of the bid-ask spread. The dependent variable in the second column is the dividend payment. All regressions include industry fixed effects based on the SIC one-digit code. All standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.