Do Government Subsidies Affect Income Smoothing?

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ABSTRACT

This study examines the relation between government subsidies and income smoothing using a sample of U.S listed firms. Our findings show that subsidized firms smooth their earnings more aggressively than their unsubsidized peers, consistent with firms that receive subsidies bearing higher political costs and having more incentives to smooth earnings to steer away from public attention and shield the politicians who award them subsidies from voter scrutiny. We also find that smoothing by subsidized firms is more pronounced when the subsidies are granted through non-tax-related channels. The findings are also stronger among firms domiciled in states with higher levels of political corruption, firms with higher political uncertainty, as well as politically connected firms. Finally, we find that subsidized firms tend to have more optimistic disclosures in the Management Discussion & Analysis (MD&A). Overall, our results shed light on how state subsidies shape the accounting and disclosure choices of subsidized firms.

Keywords: income smoothing; subsidies; political cost; disclosure tone

1. Introduction

This study investigates whether firms receiving government subsidies use discretionary accounting choices to avert negative publicity. The government has the power to transfer corporate wealth through regulations and taxations (Peltzman, 1976; Stigler, 1971). In their seminal work on positive accounting theory, Watts and Zimmerman (1978, p.115) state that: "To counter these potential government intrusions, corporations employ a number of devices, such as social responsibility campaigns in media, government lobbying, and selection of accounting procedures to minimize earnings." Empirical studies also provide evidence consistent with firms seeking to mitigate the risk of adverse political actions through downward earnings management (Cahan, 1992; Grace & Leverty, 2010; Han & Wang, 1998; Key, 1997). Unlike these studies relying largely on firm size and industry membership as proxies for political costs,[1] our paper reexamines this hypothesis by exploiting a novel dataset of government subsidies received by US companies. As a major policy tool on wealth transfers, government subsidies have the potential to provide sharper evidence on the political cost hypothesis.

While the United States keeps challenging other countries (such as China, Brazil, and India etc.) over the provision of government subsidies, it is noticeable that the US companies continue to receive billions of dollars in subsidies each year. Moreover, the vast majority of subsidy recipients are not small businesses and upstarts that the governments should have promoted. In a report released by the non-profit watchdog group Good Jobs First, "three-quarters of all the economic development dollars awarded and disclosed by state and local governments have gone to just 965 large corporations",[2] which seems to work against the model of unbridled capitalism. Preferential treatment of firms through government subsidies is likely to draw public scrutiny, making these firms politically visible. Since government

[1] For example, the political cost hypothesis is examined in the context of anti-trust investigations (Cahan, 1992), cable television industry (Key, 1997), oil and gas industry (Han & Wang, 1998), and insurance industry (GRACE & Leverty, 2010).

[2] https://pando.com/2014/02/26/fortune-500-companies-receive-63-billion-in-subsidies/

subsidies are aimed at redistributing wealth between various parties, the use of tax payers' money to prop up wealthy firms and individuals can easily invite public discontent, with the amount of discontent increasing in the magnitude of subsidy. Under public scrutiny, a firm is more likely to be detected for any wrongdoing by third parties such as analysts, the media and other public watchdog organizations, which play a central role in spreading the negative publicity against the firms to the public. The negative publicity is detrimental to the firms, because it may lead to adverse regulatory actions against the firms. Additionally, the politicians who are involved in granting the subsidies also bear the risk of being investigated or even forced to resign if they are suspected of being corrupt, resulting in the expected loss of political connections for the firms concerned.

We therefore hypothesize that firms receiving government subsidies tend to smooth their reported earnings to alleviate the likelihood of potential political backlash, as the extent of political backlash depends in part on the size of reported earnings (Hall, 1993). While the US GAAP currently lacks explicit guidance for the accounting for government subsidies received by firms, it usually looks to IFRS as a source of non-authoritative guidance, under which government subsidies are recognized as income over the period necessary to match them with the related costs (KPMG, 2012). In other words, government subsidies may affect reported earnings over multiple periods. As such, income smoothing is a more plausible accounting choice than one-off downward earnings management, which is unsustainable in a multi-period setting where accruals reverse but firms maintain their exposure to political costs.

To test our hypothesis, we examine the relationship between government subsidies and income smoothing using a sample of non-financial US firms during the period 1996-2014. We obtain the subsidy data from *Subsidy Tracker*, a database that provides extensive source of subsidies granted to individual firms. Since the vast majority of subsidies flow to large firms, out of 61,362 observations in our sample, less than 10% (5,903) are subsidy recipients. The receipt of subsidies is not randomly assigned such that firm characteristics of subsidized

firms may differ systematically from those of unsubsidized firms. As a result, the potential confounds hinder our ability to draw causal inferences regarding the impact of government subsidies on income smoothing. To reduce the possible "overt bias", we follow previous studies (Armstrong, Jagolinzer, & Larcker, 2010; Cheng, Dhaliwal, & Zhang, 2013; Koh & Reeb, 2015) and create a matched sample by employing propensity score matching (PSM). This approach ensures that the subsidized firms (i.e. treatment firms) and unsubsidized firms (i.e. control firms) are similar along a set of firm characteristics, except the receipt of subsidies.

We capture income smoothing using two measures that are widely used in the literature: ratio of the standard deviation of earnings adjusted for abnormal accruals to the standard deviation of cash flows from operations (e.g., Jung, Soderstrom, & Yang, 2013) and the correlation between the change in total accruals and the change in pre-managed earnings (multiplied by -1 so that higher values indicate higher income smoothing) (e.g., Tucker & Zarowin, 2006). Both measures are calculated using a rolling window of current and past four years. Following Tucker and Zarowin (2006), to control for industry effects, we use a firm's fractional ranking of income smoothing (between 0 to 1) within its industry. Our main proxy for income smoothing is measured by averaging the fractional rankings of the two measures above.

Our results show a positive association between government subsidies and income smoothing, consistent with the political cost hypothesis. The results are robust to alternative measures of income smoothing and government subsidies. In addition, we partition the subsidies into tax-related components (e.g., tax credit/rebate, property tax abatement, etc.) and non-tax-based components (e.g., cash grant, cost reimbursement, etc.).[3] We find that the impact of government subsidies on income smoothing is mainly through the non-tax-based

[3] For a detailed discussion of the distinction between tax and non-tax related subsidies, see Alesina and Ardagna (2010).

channels, consistent with non-tax-based subsidies being associated with higher regulatory capture than tax-related subsidies.

We further examine whether firms' incentives to smooth earnings vary cross-sectionally with the magnitude of potential political costs. Politicians are likely to extract "rent" or "bribe" for applying their discretionary authority to award subsidies to firms (Shleifer & Vishny, 1994). As such, subsidized firms headquartered in more corrupt states are expected to have higher political costs, and therefore engage in more income smoothing. We follow prior literature (e.g., Smith, 2016) and use US Department of Justice data on the number of corruption convictions of public officials in each state to proxy for state-level corruption. Consistent with our prediction, we find that the positive association between subsidies and income smoothing is more pronounced for firms in more corrupt areas. Additionally, we find that the positive impact of subsidies on income smoothing is more prominent for firms which provide contributions to political campaign, consistent with such firms being exposed to higher public attention and political costs. Moreover, we find that government subsidies received by firms with greater political uncertainty are associated with higher degrees of income smoothing, in line with the notion that political cost increases with political uncertainty (Pástor & Veronesi, 2013). Taken together, these results suggest that firms' incentives to smooth earnings in the presence of negative publicity tend to be stronger when the expected political costs are higher.

Finally, we investigate how government subsidies affect the tone of forward-looking statements such as Management Discussion & Analysis (MD&A) disclosures. Bozanic, Roulstone and Buskirk (2012) argue that managers' decisions to issue quantitative earnings forecasts differ from the decisions to issue qualitative forward-looking information, because managers fear the *ex post* verifiability of quantitative projections while value the controllability of forward-looking statements. Our results lend further support to this argument by showing that subsidies, whether tax-related or non-tax-related subsidies, are

associated with more optimistic MD&A disclosures, despite firms attempting to dampen their financial performance through smoothing reported earnings.

Our study contributes to the literature in several ways. First, this paper extends the literature by providing sharper evidence on political cost hypothesis. Government subsidy is considered a more direct proxy for political cost consideration because monetary government support is more likely to invite public scrutiny than alternative measures of political costs such as firm size and industry membership. Second, the existing empirical research provides mixed evidence on the consequences of government subsidies around the world, with some studies suggesting they are beneficial (e.g., Bagwell & Staiger, 1989) and others inferring they are detrimental (e.g., Schwartz & Clements, 1999). However, most of these studies focus on the economic outcomes of subsidies, with very little attention being paid to their impact on corporate accounting and disclosure choices. One exception is Lee, Walker and Zeng (2016), who document evidence that state subsidies of Chinese listed firms are positively associated with firms' decisions to issue corporate social responsibility disclosures. To the best of our understanding, our study is the first to examine the impact of government subsidies on accounting choices in the context of US. Finally, our findings provide insights on subsidy-related policy making. Governmental Accounting Standards Board (GASB) statement No. 77 requires state and local governments to provide increased disclosure on government assistance, which aims to increase politician's accountability in the process of granting subsidies. In addition, on November 12, 2015, the Financial Accounting Standards Board (FASB) issued a proposal to improve the transparency of information provided in the financial statements regarding government subsidies.[4] Our study sheds light on financial reporting consequences of government subsidies and provides evidence in favour of these regulations.

[4] http://www.pwc.com/us/en/cfodirect/publications/in-brief/fasb-new-disclosures-government-grants-tax-incentives.html

The rest of the paper is organized as follows: Section 2 briefly introduces the background of government subsidies in the US. Section 3 reviews literature on income smoothing and develops our testable hypotheses. Section 4 explains research design, sample and data. Section 5 presents our empirical results, and section 6 concludes the paper.

2. Background

In the United States, hundreds of billions of dollars in subsidies have been awarded to business each year, with three-quarter going to fewer than 1,000 large firms. The statistics from Good Jobs First show that, Boeing ranked first in 2013, with 137 subsidies totalling $13.2 billion, followed by Alcoa at $5.6 billion, Intel at $3.9 billion and General Motors at $3.5 billion.[5] Despite this, Boeing still expressed righteous indignation over the government aid received by its European competitor Airbus.[6] As another example, Koch Brothers has received $88 million worth of government subsidies, despite their billing as libertarian "free market" activists. Subsidies are getting more controversial in recent years as the press pays much more attention to them. According to Richard Ciccarone, CEO of Merritt Research Services, "subsidies have become more of a negative among politicians and a lot of people are hot on that issue".

There are a few reasons why governments use subsidies as a policy tool. From an economic perspective, the main purpose of subsidies is to offset market imperfections, exploit economies of scale in production, meet social policy objectives, and reduce unemployment (Schwartz & Clements, 1999). However, since subsidies in US are largely going to extremely wealthy individuals and politically connected firms, they do not actually end up with creating job opportunities or generating a net gain in public revenues. This argument is corroborated by some empirical evidence (e.g., Ahearn, El-Osta, & Dewbre, 2006; Wallsten, 2000). While

[5] http://america.aljazeera.com/opinions/2014/2/corporate-welfaresubsidiesboeingalcoa.html

[6] In a 2004 conference call with analysts and the press, Boeing's CEO Harry Stonecipher explained that the state aid that Boeing received was not a subsidy but was simply a matter of "lowering the cost of doing business".

subsidy can be ineffective and costly, it may have political benefits such as logrolling or vote trading (Houthakker, 1972). For example, subsidies may be exploited or even abused by politicians and turned into a political tool for their own election campaigns (Becker, 1983; Peltzman, 1976).

Subsidy is a policy instrument commonly employed by all levels of government, especially so for state and local governments. In our dataset, 71.2% of all subsidies by dollar value are awarded by non-federal governments. For instance, the largest federal subsidy is worth $465.26 million, received by Abengoa in 2014, whereas the largest state subsidy is worth $8.83 billion, received by Boeing in 2013. In the presence of "competitive federalism", the state and local governments have more incentives and freedom than federal government to award subsidies so as to compete with each other and attract businesses. Take an example from Boeing. In March 2001, Boeing held a press conference and revealed that it planned to move its headquarter out of Seattle, in which it had been based for 75 years. After making the announcement, several cities and states expressed their strong interest and launched frantic and high-profile campaigns with the intent of winning the prize. Among the competitors, for instance, Chicago and the State of Illinois offered a package of subsidy totalling $56 million. Finally, Boeing remained in Seattle and ended up with a package of tax credits and cuts that were estimated to be worth $3.2 billion over 20 years.

These subsidies can be broadly classified into tax-related and non-tax-related subsidies based on previous research (e.g., Alesina & Ardagna, 2010; Raghunandan, 2016). Tax-related subsidies account for the largest proportion of total subsidies, including tax rebates and various reductions of tax liabilities. Non-tax-based subsidies are often provided in the forms of cash grants and credit subsidies. While the two classes of subsidies aim to achieve the same policy objectives, they are often considered to be distinct actions in practice. Tax-related subsidies are a method of reducing governmental revenue without directly affecting other spending, whereas non-tax-related subsidies involve increases in governmental

spending without directly altering other revenue. In many circumstances, the subsidy package consists of both types of subsidies. In addition to these explicit government subsidies, there are also implicit subsidy elements such as government contracts and regulatory actions that alter market prices. This means that the observed subsidies typically comprise only a fraction of the full extent of subsidies. Since it is nearly impossible to know the full extent of subsidies, the available subsidy data have usually been confined to what can readily be observed and quantified as we do.

3. Literature Review and Hypothesis Development

3.1. Literature Review of Income Smoothing

There is ample accounting literature suggesting that financial statement users prefer a smoother stream of income to a more volatile one (Beidleman, 1973; Gordon, 1964; Ronen & Sadan, 1981). A recent survey by De Jong (2014) indicates that analysts are positively predisposed towards smoother income paths, forgiving small sacrifices in value. In the same spirit, Graham, Harvey, and Rajgopal (2005) report that the vast majority of surveyed CFOs prefer a smoother income path. Managers make accounting choices that overstate low earnings and understate high earnings, thereby artificially reducing the volatility of reported earnings.

The literature offers two distinct views on income smoothing, regarding it either beneficial or pernicious. Several analytical studies focus on the role of income smoothing as a mechanism to provide useful information for compensation contracting (Demski, 1998; Dye, 1988; Kirschenheiter & Melumad, 2002; Lambert, 1984). Chaney and Lewis (1995) and John, John, and Ronen (1996) explore the costliness of signalling through income smoothing. For high performing firms that want to signal their type, there must be some cost associated with reporting smoother income to make it difficult for other low performing firms to mimic their behaviour. Some studies argue that managers choose to smooth earnings to make public their

private information about the true underlying performance of the firm. Ronen and Sadan (Ronen & Sadan, 1981) and Sankar and Subramanyam (Sankar & Subramanyam, 2001) note that a smoother earnings pattern can reduce distortions in market prices. The studies of Subramanyam (1996) and Tucker and Zarowin (2006) argue that income smoothing improves the future predictability of reported earnings. Dou, Hope, and Thomas (2013) find that firms use income smoothing in presence of incomplete contract to send a signal to their suppliers in countries that is difficult to enforce contracts.

A more malevolent view argues that income smoothing is used to opportunistically obfuscate information from shareholders (e.g., Leuz, Nanda, & Wysocki, 2003). What makes pernicious smoothing different is the motivation behind income smoothing. Firms that have volatile operations due to excess risk taking will naturally have more volatile earnings. Thereby, managers attempt to hide such volatility by providing a stream of earnings with lower fluctuations that mimic the reported earnings of firms with natural smooth income (P. M. Dechow & Skinner, 2000). In an international setting, Leuz, Nanda, and Wysocki (2003) find evidence that countries with weak investor protection engange in more income smoothing and Lang, Lins, and Maffett (2012) find that income smoothing reduces transparency and increases the cost of capital. Other studies suggest that managers use income smoothing to increase their compensation (Healy, 1985), protect their jobs (Defond & Park, 1997; Fudenberg & Tirole, 1995) and create a safety net from taking too much risk (Grant, Markarian, & Parbonetti, 2009). Evidence from Jayaraman (2008) suggests that insiders use smoother earnings to garble information and to benefit from informed trading.

Collectively, these studies focus largely on the economic incentives of income smoothing, with relatively limited attention being paid to political considerations. In particular, whether and how government subsidies can induce income smoothing have remained unexamined, and our study fills this research void.

3.2. Hypothesis Development

The political cost hypothesis is frequently used to explain managerial accounting choices (Healy & Palepu, 2001). To the extent a firm is subject to potential wealth transfers in the regulatory process, its managers have incentives to use discretionary accounting choices to mitigate the risk of possible adverse political actions (Watts & Zimmerman, 1978). Government subsidy is well recognized as a policy tool to achieve the objective of income redistribution. Specifically, corporate subsidies are typically funded through general taxation, and paid to firms with intent of raising their profits beyond those that would be earned without such intervention (Schwartz & Clements, 1999). Nevertheless, as discussed in the previous section, these subsidies disproportionately flow to large corporations, and not to small businesses, which have invited widespread attention from the media (e.g., The Wall Street Journal, The New York Times, etc.), and some watchdog organizations (e.g., Good Jobs First, etc.). Moreover, whether or not corporate subsidies should be eliminated has become a topical issue in public debates or even campaign speeches.[7] As such, firms that receive government subsidies are associated with higher political costs and are more likely to attract public scrutiny especially when they report large profits. The negative publicity due to the revelation of large profits can trigger political backlash, because such subsidization is essentially seen as using taxpayers' money to prop up wealthy individuals. Consequently, we predict that firms receiving government subsidies are more likely to engage in income smoothing in order to mask the benefits gained from government assistance and avoid further political backlash. The first hypothesis is formulated as follows:

> ***H1****: There is a positive association between government subsidies and income smoothing.*

[7] http://www.intelligencesquaredus.org/debates/eliminate-corporate-subsidies

The political cost concern fueled by receiving government subsidies varies depending on the types of subsidies granted. As explained in the previous section, corporate subsidies are provided mainly through two channels. The first is tax breaks, which reduces the tax liabilities of the recipients and decreases governmental revenue without direct impact on governmental spending. The second is non-tax-based fiscal support, which is offered in the forms of cash grants or credit subsidies, leading to an increase in governmental expenditure without directly altering government revenue. Mettler (2011) argues that in the United States the directly provided benefits tend to be more visible than tax-based benefits. Since the magnitude of political costs depend heavily on the degree of public visibility, subsidies with higher visibility such as non-tax-related subsidies are expected to incur higher political costs than tax-related subsidies. This leads to the following hypothesis:

H2*: The positive relationship between government subsidies and income smoothing is more pronounced when subsidies are granted through non-tax than tax based channels.*

The political costs of government subsidies arise in large part due to the suspicion that these subsidies are received through political corruption rather than economic considerations, which may in turn cost taxpayers millions of dollars (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1999). A number of studies provide evidence that firms can benefit from a corrupt environment by gaining preferential access to government contracts or favorable loan terms (e.g., Faccio, Masulis, & Mcconnell, 2006; Fisman, 2001; Tahoun, 2014). Consequently, subsidy recipients in more corrupt areas tend to draw higher public attention leading to higher exposure to political costs. To reduce the likelihood of possible negative publicity, firms receiving subsidies, especially in the form of non-tax-based subsidies, are more likely to smooth their reported earnings. Thus, we further hypothesize that:

H3a*: The positive relationship between government subsidies and income smoothing is more pronounced for firms domiciled in more corrupt areas.*

H3b: *The positive relationship between government subsidies and income smoothing among firms in corrupt areas is more pronounced when subsidies are granted through non-tax than tax based channels.*

Prior studies suggest that firms benefit from political connections, established by contributing to campaigns of election candidates, through preferential access to finance (Claessens, Feijen, & Laeven, 2008), lower litigation risk (Correia, 2014) and more corporate bailouts (Faccio et al., 2006). Ramanna and Roychowdhury (2010) argue that corporate contributors suffer more public visibility and are therefore likely to have higher political costs. Thus, we hypothesize that government subsidies of contributing firms are more positively associated with income smoothing than those of non-contributing firms, particularly so when the subsidies are provided through non-tax-based channels.

H4a*: The positive relationship between government subsidies and income smoothing is more pronounced for firms making campaign contributions.*

H4b: *The positive relationship between government subsidies and income smoothing among contributing firms is more pronounced when subsidies are granted through non-tax than tax based channels.*

Political uncertainty could also increase political costs arising from receiving subsidies. Darby, Li and Muscatelli (2004) suggest that political uncertainty reduces public expenditure because incumbent government tends to value public investment less if the coming election is uncertain. Instead, political uncertainty encourages governments to run down the economy's assets, with an expectation that the succeeding governments are likely to raise capital taxation

and depress private investment (Devereux & Wen, 1998). In such circumstances where public spending is reduced, the receipt of government subsidies by firms is more likely to attract public attention, which leads to higher political costs. Hence, we predict that government subsidies, especially the non-tax-related subsidies, are more positively associated with income smoothing for firms facing greater political uncertainty.

H5a*: The positive relationship between government subsidies and income smoothing is more pronounced for firms having higher political uncertainty.*

H5b: *The positive relationship between government subsidies and income smoothing among politically uncertain firms is more pronounced when subsidies are granted through non-tax than tax based channels.*

4. Research Design, Data and Sample

4.1 Propensity-Score Matched Sample Analysis

The receipt of a subsidy is not a random event such that to make causal statements and study the impact of the treatment variable (subsidies) on the outcome (income smoothing) we must rely on a matching procedure. To generate our control sample, we use propensity-score matching.[8]

Following extant literature on propensity-score matching (Armstrong et al., 2010) we use a set of covariates to control for differences between treatment and control samples. For each treatment observation, we find a control that has the smallest differences across our selected covariates. Since there is no prior study that identifies the determinants of the likelihood of receiving subsidies, we select a set of firm characteristics and general political environment variables that we believe affect the choice to obtain a subsidy.

[8] Alternative matching procedures such as greedy and optimal matching lead to similar conclusions.

To obtain the propensity scores we estimate the following logistic model for the likelihood of a firm receiving subsidies:

$$\Pr(DSubsidy) = \alpha_1 + \beta_1 Size + \beta_2 Lev + \beta_3 ROA + \beta_4 Rd + \beta_5 Foreignsales + \beta_6 Employees + \beta_7 Election\_year + \sum YEAR + \sum INDUSTRY + \epsilon_t \quad (1)$$

where the dependent variable *DSubsidy* is an indicator variable that equals to one for firm-years that received subsidies. Firm size (*Size*) is the natural logarithm of the firm's market value, measured at the beginning of the fiscal year. Leverage (*Lev*) is the firm's long-term debt divided by long-term debt plus common equity. Return on assets (*ROA*) is the firm's earnings before extraordinary and discontinued items scaled by prior year's total assets. Research and Development expenditures (*Rd*) is the firm's Research and Development expenditures over total assets.[9] Foreign sales (Foreignsales) is the ratio of non-domestic sales over total sales of the firm. Employees (E*mployees*) is the natural logarithm of the firm's number of employees. Election year (*Election_year*) is an indicator variable that equals to one if the firm's fiscal year falls into a presidential election cycle. We also employ industry and year fixed effects. The propensity score for each firm-year is the predicted value in Model (1). We then match each treatment firm (with replacement) with a control firm that has the closest score while imposing a caliper of 0.03 and common support.

Panel A Table 1 reports the estimates of the logistic propensity-score regression of firms receiving a subsidy. Our results indicate that larger firms that employ more people and with higher growth opportunities have a higher probability of receiving a subsidy. We also observe that firms with higher non-domestic sales have a lower probability to receive subsidies. Inconsistent with our expectation, election cycle does not play a role in the likelihood of firms receiving subsidies. Panels B and C provide diagnostics between treatment and control

[9] Missing values of R&D expenditures are replaced with zero.

firms regarding covariate balance. The mean differences of covariates before and after matching indicate the quality of the matching procedure. Although, *Size* and *Employees* remain statistically significant after matching, the differences are not economically significant. Moreover, both the explanatory power of the propensity score model (*Adj. Pseudo-*R^2=45.7%) and the overall measures of covariate imbalance point towards a successful match.

[Insert Table 1 here]

4.2 Association Between Subsidies and Income Smoothing

Our study examines the relationship between subsidies and income smoothing. We argue that firms that receive subsidies have a smoother income. Therefore, income smoothing can be modelled as a function of the amount of subsidies each firm receives and control variables that affect income smoothing decisions:

Income smoothing = f (amount of subsidies, control variables) (2)

4.2.1 Measuring Subsidy

To construct subsidy related variables, we perform the following steps. We start by collecting the dollar amount of all subsidies the firm receives during the fiscal year from all potential sources (state, local, or federal). The variable *Subsidy* is the natural logarithm of one plus the total dollar amount of subsidies the firm receives during the fiscal year. To find the different effect of the type of subsidies on income smoothing, we separate subsidies by type. Accordingly, the variable S*ubsidy_all_tax (Subsidy_non_tax)* is the natural logarithm of one plus the dollar amount of tax (non-tax)-related subsidies the firm receives during the fiscal year. Since the income-smoothing proxy is calculated using a five-year window, we use five-year average of subsidy measures as our independent variables.

4.2.2 Measuring Income Smoothing

To construct the proxy for income smoothing we rely on two methodologies developed by Jung, Soderstrom, and Yang (2013) and Tucker and Zarowin (2006) respectively. There is a common underlying rationale for both measures. Because managerial decisions to smooth income are unobservable, we must rely on a proxy to measure the manager's actions to smooth the unobservable unsmooth stream of earnings. We can achieve this goal by decomposing earnings into two separate components, normal and abnormal, where the abnormal part includes all those actions that managers take to smooth earnings.

Following Jung, Soderstrom, and Yang (2013) we take three steps to separate income smoothing relating to managerial decision from inherent smoothing in earnings that is determined by economic and firm-specific factors. First, income smoothing based on reported earnings is measured as the standard deviation of earnings scaled by the standard deviation of cash flows from operating activities multiplied by negative one (Hunt, Moyer, & Shevlin, 1996; Jung et al., 2013; Leuz et al., 2003; Pincus & Rajgopal, 2002). Second, income smoothing based on earnings adjusted for abnormal accruals is measured as the standard deviation of pre-managed earnings scaled by the standard deviation of cash flows from operating activities multiplied by negative one (Jung et al., 2013). We measure abnormal accruals using the modified Jones model (P. M. P. Dechow, Sloan, & Sweeney, 1995). Pre-managed earnings are the difference between earnings and abnormal accruals. Finally, income smoothing activity (*IS_JSY*) is measured as the difference between income smoothing based on reported earnings and income smoothing based on earnings adjusted for abnormal accruals.

To construct our second income smoothing proxy we follow Tucker and Zarowin (2006) and calculate *IS_TZ* as the correlation between changes in abnormal accruals and changes in pre-managed earnings. In our tests, we use the invert of *IS_TZ*, so as higher values indicate

higher income smoothing. Both measures are calculated on a rolling window of current and past four years. We require data to be present for three consecutive years. This enables us to have more observations facilitating a better matching procedure. Moreover, to mitigate concerns about the influence of extreme observations and to control for industry and time effects, we use the ranks of *IS_JSY* and *IS_TZ* rescaled to range between zero and one. Finally, we include a composite measure of income smoothing (*IS*) calculated as the average rank of *IS_JSY* and *IS_TZ*.

4.2.3 Control Variables

We employ a variety of control variables identified in prior literature to be related with income smoothing (Dou et al., 2013; Grant et al., 2009; Tucker & Zarowin, 2006). *Size* is the natural logarithm of the firm's market value, measured at the beginning of the fiscal year. For growth opportunities (*Sgrowth)* we use the firm's current year's sales less prior year's sales, divided by prior year's sales. Profitability (*ROA)* is the firm's earnings before extraordinary and discontinued items scaled by prior year's total assets. Leverage (*Lev)* controls for capital structure and adverse selection calculated as the firm's long-term debt divided by the sum of long-term debt and common equity. We control for growth opportunities by including book-to-market ration (b*tm)*, calculated as the firm's common equity divided by its market capitalization. To control for investment intensity, we include *invint* as the sum of R&D, advertising, and human capital investment scaled by prior year's total assets. To control for earnings variability, we include *std_earn* calculated as the standard deviation of earnings scaled by total assets using data from the last five years. We also control for analyst following (*lnanalyst*) as the natural logarithm of one plus the number of analysts recorded in I/B/E/S that issue annual earnings forecasts for the firm during the fiscal year. Analysts can act either as monitors inhibiting income smoothing behavior, or they could substitute the signaling properties of income smoothing. Firm's age (Lnage) is the natural logarithm of one

plus the number of years since the firm appears in the CRSP monthly file. Because our main independent variables are calculated over a five-year window, we follow Grant et al. (2009) and use five-year averages of control variables.[10] Finally, we control for year, industry, and state specific factors by including indicator variables.

4.3 Other Variables

4.3.1 Tone of Management Discussion and Analysis

The Management Discussion and Analysis (MD&A) section of the 10-K filings is designed to disseminate information about the firms' liquidity, capital resources and critical accounting estimates. It provides a means for managers to make private information public and inform investors about predictable future events and known trends that will affect future operations of the firm. Therefore, it is important to assess the impact of subsidies on narrative reporting.[11]

To analyze the information content of the MD&A we explore the variation in tone for firms that receive subsidies. We model MD&A tone as a function of the amount of subsidies each firm receives and control variables that affect the informational environment of the firm.

$$MD\&A\ Tone = f\ (amount\ of\ subsidies,\ control\ variables) \qquad (3)$$

Our measure of tone is expressed as the ratio of the difference between positive and negative words over the sum of positive and negative words. To construct positive and negative word counts we rely on the word lists developed by Loughran and Mcdonald (2011). We use an array of control variables that aim to capture the variation in the tone of MD&A following Li (2010).

[10] For a firm-year to remain in the sample it must have three consecutive years of data.
[11] We focus on the MD&A section rather than the overall narrative reporting, because it distills the management's intentions about the future and acts as a signal to the market.

We control for the firm's performance, proxied by earnings (*earn*) and returns (*ret*). Differences in firm size (*size*) and growth opportunities (*btm*) affect the disclosure incentives of firms. Firms operating in more volatile business environments will disclose less information because of the uncertainty regarding their future performance. We proxy for the volatile environment using the standard deviation of returns (*std_ret*) and earnings (*std_earn*). Firm age (*lnage*) is used to capture the uncertainty of younger firms. The complexity of operation is captured by the number of business (*seg_bus*) and geographical (*seg_geo*) segments. We also include indicator variables to control for year, industry, and state effects.

4.3.2 Corruption

Consistent with Smith (Smith, 2016), to proxy for the actual level of corruption at state level we use the yearly number of corruption convictions from the US Department of Justice Public Integrity Section (PIN) scaled by the US Census Bureau population data.[12] In conditional tests we use the use an indicator variable taking the value of one when corruption is higher than the median, and zero otherwise.

4.3.3 Political Uncertainty

To construct the proxy for political uncertainty we follow the method described in Francis, Hasan, and Zhu (Francis, Hasan, & Zhu, 2014). They model political uncertainty as a risk factor that systematically impacts the market. As the political uncertainty affects firm value, stock returns will impound the respective risk. We augment the Fama and French (1993) three factor model with the monthly percentage change of the political conditions using the Political Uncertainty Index compiled by Baker, Bloom, and Davis (2015).

$$R_{it} = \propto + E_{Pi} * R_{Pt} + \gamma_{Mi} * R_{Mt} + \gamma_{Mi} * SMB_t + \gamma_{Mi} * HML_t + \varepsilon_{it} \quad (4)$$

[12] Some finance and economic studies that use PIN to investigate corruption include Fisman and Gatti (2002), Glaeser and Saks (2006), and Butler, Fauver, and Mortal (2009).

where R_{it} is the firm's monthly stock return net of risk free rate, R_{Pt} is the monthly percentage change in the political index, R_{Mt} is the monthly value weighted market return net of risk free rate, SMB_t and HML_t are the Fama-French factors for size and value weighed portfolios. The coefficient E_{Pi} captures the sensitivity of the firm's stock returns to the changes in political uncertainty (Francis et al., 2014). In empirical tests, to capture a firm's political exposure we use an indicator variable taking the value of one when the absolute value of E_{Pi} is higher than the median, and zero otherwise.

4.3.4 Political Connections

To measure political connections, we use the existence of a Political Actions Committee (PAC) sponsored by a firm (Cooper, Gulen, & Ovtchinnikov, 2010; Correia, 2014). The firms can form a PAC to raise funds in support of or against candidates in an election campaign. Following Cooper et al. (2010) and Kim and Zhang (Kim & Zhang, 2016) firms are categorized as politically connected (*PC=1*) if they registered a PAC in November of a particular year.

4.4 Sample and Data

Our data are derived from the intersection of nine sources. Subsidy data are from Subsidy-Tracker.[13] Firm-level accounting data are from Compustat. Returns, share prices, and common shares are from CRSP monthly files. Tone data are from 10-K fillings available through SEC's Electronic Data Gathering, Analysis, and Retrieval (EDGAR).[14] Analyst following data are from the I/B/E/S detail file. Political connections data are from Center for Responsive Politics which maintains clean datasets of PAC fillings from Federal Election

[13] http://www.goodjobsfirst.org/subsidy-tracker

[14] To clean the files collected from EDGAR we follow Loughran and Mcdonald (2011). Subsequently, we use a PERL program to parse the tokenized 10-Ks and extract the MD&A section (item 7 & 7A). Finally, we drop observations that have less than 250 words because they incorporate the MD&A section by reference.

Commission. Corruption data are from the Department of Justice Public Integrity Section. Political uncertainty date are from Baker, Bloom, and Davis (2015).[15] Our sample covers the period from 1996 to 2015. The first year is dictated by the availability of comprehensive data from EDGAR. We exclude financial and utility firms (SIC 4400-4999 and 6000-6999) because their accrual generation process differs from other firms. All continuous variables are winsorized at 1 and 99 percent.

5. Empirical Results

5.1. Summary Statistics and Correlations

Panel A Table 2 reports summary statistics for the main variables used in our study. The previous matching approach produces a sample of 8,982 observations. On average, our sample firms receive subsidies amounted to \$0.54 million (i.e., $e^{0.435}$-1). The mean tax-related (non-tax-related) subsidies equal \$0.28 million (\$0.21 million), respectively. Panel B reports the mean difference of income smoothing between subsidized and unsubsidized firms. Columns (1)-(3) reports the mean comparison based on the pre-matched full sample, in which subsidized firms account for only 9.6%. No matter which measure of smoothing is used, subsidized firms exhibit significantly higher level of income smoothing than do unsubsidized counterparts. While this result provides initial support to our conjecture, it should be interpreted with caution due to the possible presence of self-selection bias. Columns (4)-(6) present the results based on propensity scoring matching. Following the matching, the difference in income smoothing decreases both economically and statistically. Despite this, we still find that *IS* and *IS_JSY* are higher for the subsidy recipients and the differences are significant at the 5% level.

[Insert Table 2 here]

[15] http://www.policyuncertainty.com/

Table 3 presents the pairwise correlations between the variables used in regressions. The three income-smoothing measures are highly correlated with each other, with correlation coefficients ranging from 0.686 to 0.918. In addition, the income-smoothing variables are significantly positively correlated with total subsidy and subsidy components, lending further support to our main hypothesis that income smoothing increases with government subsidies.

[Insert Table 3 here]

5.2. The Impact of Government Subsidy on Income Smoothing

Table 4 presents the results of regressing income smoothing on government subsidy. The estimated coefficients on subsidy are significantly positive across three columns. For example, in Column (1) where the dependent variable is the composite measure (i.e., *IS*), the coefficient on subsidy is 0.007 and significant at the 1% level. This result suggests that firms receiving government subsidies are likely to engage in more income smoothing. Columns (2) and (3) separately report the results with *IS_TZ* and *IS_JSY* as alternative measures of income smoothing. Likewise, the coefficient estimates on subsidy remain positive and significant for both measures. Taken together, the above findings confirm our hypothesis H1 that income smoothing can be used as an accounting choice for subsidized firms to avoid negative publicity and ensuing public scrutiny stemming from the government financial assistance they receive.

[Insert Table 4 here]

5.3. The Impact of Tax and Non-Tax Subsidy on Income Smoothing

Table 5 reports the evidence for hypothesis H2. As discussed in Section 3.2, non-tax based subsidy is subject to a higher degree of public visibility than tax-related subsidy, so we are interested to know if the impact of subsidy on income smoothing is more likely to be through the non-tax related channels. As can be seen in Columns (1)-(3), in which the

composite measure *IS* serves as the dependent variable, the coefficients on tax subsidy are insignificant whereas the coefficients on non-tax subsidy are positive and significant at the 1% level. This finding is broadly robust to alternative measures of income smoothing, as reported in columns (4)-(9). Overall, these results are in line with the prediction of hypothesis H2 that non-tax based subsidies have a greater positive impact on tax-based subsidies on the accounting choices of subsidized firms to smooth their reported earnings.

[Insert Table 5 here]

5.4. Cross-Sectional Variation in the Impact of Subsidy on Income Smoothing

5.4.1. Effect of Political Corruption

We further investigate whether the impact of government subsidy on income smoothing is more pronounced for firms headquartered in more corrupt areas. This is because such firms are subject to more skepticism that the subsidies they have received are exchanged from politicians through bribes or other rent-seeking activities. Thus, these firms tend to be more politically visible and exposed to higher political costs. The results are presented in Table 6. We focus on the composite income-smoothing measure in the interest of space. [16] Columns (1) and (2) report the impact of total subsidies on income smoothing for firms in low and high corrupt areas, respectively. As expected, the coefficient estimate on subsidy is significantly more positive for firms in more corrupt areas, consistent with our hypothesis H3a. Columns (3)-(4) report the effect of subsidy components on income smoothing. Consistent with our prediction in H3b, we find that the positive influence of subsidies on income smoothing among firms in more corrupt areas is primarily through the non-tax based channels. These results imply that the incentives to smooth earnings due to receiving subsidies are particularly strong for firms with greater exposure to political costs.

[Insert Table 6 here]

[16] The results remain qualitatively unaffected by using alternative income-smoothing measures.

5.4.2. Effect of Campaign Contribution

In this subsection, we further examine whether individual firms' political connection, as captured by the campaign contribution, influences the relationship between government subsidies and income smoothing. Similar to political corruption, campaign contributions render the contributing firms greater political visibility and public scrutiny due to the concern that the subsidies of these firms are received through some under-the-table dealings. Table 7 presents the results with composite income-smoothing measure as the dependent variable. Columns (1) and (2) report the results using total subsidy as the independent variable. Consistent with the prediction in hypothesis H4a, our results show that the relationship between subsidies and income smoothing is negative and insignificant among unconnected firms, but is significantly positive among connected firms. Furthermore, as can be found in columns (3) and (4), the positive relation between subsidy and income smoothing for the connected firms is mainly reflected through the non-tax based subsidy, which is consistent with our hypothesis H4b.

[Insert Table 7 here]

5.4.3. Effect of Political Uncertainty

In addition to corruption and campaign contribution, another factor that may mediate political costs is political uncertainty, as hypothesized in H5a and H5b. In columns (1) and (2) of Table 8, the results show that the positive association between total subsidy and income smoothing is significantly higher for firms suffering greater firm-specific political uncertainty. Moreover, in columns (3) and (4) where the total subsidy is decomposed into tax and non-tax based subsidy, we find that the positive relation between subsidy and income smoothing is driven by the non-tax based component. Thus, our hypotheses H5a and H5b are confirmed.

[Insert Table 8 here]

5.5. The Impact of Government Subsidy on the Tone of Forward-Looking Narratives

A different channel through which managers can discuss the effect of government subsidies on the firm's business operations is the MD&A section of the 10-K filings. In this subsection, we analyse how subsidies affect the tone expressed in the MD&A sections. Table 9 presents the results of regressing tone on a variety of subsidy measures. Overall, our results show that the tone of MD&A sections is positively associated with government subsidies, irrespective if they are tax or non-tax related. The findings imply that managers of firms receiving subsidies have more optimistic tone when they discuss firm's current and future operations.

[Insert Table 9 here]

6. Conclusion

In this study, we analyse whether firms that receive subsidies use income smoothing to reduce their political exposure. We examine the political cost hypothesis using government subsidies as a proxy for political costs contrary to existing studies that proxy for political costs using firm size and industry membership. Employing a propensity-score matched sample research design, we find robust evidence that government subsidies positively impact a firm's income smoothing behaviour, consistent with the political cost hypothesis. In addition, our results show that non-tax based rather than tax-related subsidies are the main forces driving the positive relation with income smoothing.

A set of cross-sectional variation analyses focus on the magnitude of potential political costs and how it affects firms' incentives to smooth earnings. By examining state-level corruption, political connections and political uncertainty, our results provide further evidence that the positive association between subsidies and income smoothing is more pronounced for firms facing higher political costs.

This study makes several contributions. Our results extend the support for the political cost hypothesis, using a more direct proxy for political cost. Furthermore, to best of our knowledge is the first study to demonstrate empirically the impact of government subsidies on accounting and disclosure choices in the U.S. Finally, our findings could potentially offer policy implications, in line with the proposals of GASB and FASB, by providing insights on financial reporting consequences of government subsidies.

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Appendix A
Definition and Measurement of Variables

Variables	*Definition and Measurement*	*Source*
Btm	The firm's common equity (*ceq*) divided by its market capitalization (*prcc_f* × *csho*).	Compustat
Corruption	Corruption convictions from the Department of Justice Public Integrity Section scaled by population scaled by US Census Bureau population data, following Smith (2016).	The Department of Justice
Earn	The firm's earnings (*ni*) scaled by its book value of assets (*at*).	Compustat
Election_year	An indicator variable capturing election year, equal to one for firms that their fiscal year fall into an election year, zero otherwise.	FEC
Employees	Natural logarithm of one plus the number of employees (*emp*).	Compustat
Foreignsales	The ratio of firm's non-domestic sales over total sales.	Compustat Segment File
Invint	The sum of R&D, advertising, and human capital investment (xrd + xad + at - ppent) scaled by prior year's total assets (*at*).	Compustat
IS	Average ranking of *IS_Jung* and *IS_TZ.*	Compustat
IS_JSY	Following Jung et al. (2013), income smoothing is calculated as the difference between smoothness based on reported earnings minus smoothness based on earnings adjusted for abnormal accruals. Income smoothing based on reported earnings is the standard deviation of earnings before extraordinary and discontinued items (*ibc*) for current and past four years divided by the standard deviation of cash flows from operating activities (*oancf*) for current and past four years and then the result is multiplied by -1. Both earnings and cash flows are scaled by prior year's total assets (*at*). Income smoothing based on earnings adjusted for abnormal accruals is the standard deviation of pre-managed earnings for current and past four years divided by the standard deviation of cash flows from operating activities (*oancf*) for current and past four years and then the result is multiplied by -1. Abnormal accruals are calculated using the modified Jones model (Dechow et al., 1995). Pre-managed earnings are the difference between earnings and abnormal accruals.	Compustat
IS_TZ	Following Tucker and Zarowin (2006), income smoothing is calculated as the correlation between the change in abnormal accruals and the change in pre-managed income and then the result is multiplied by -1. Abnormal accruals are calculated using the modified Jones model (Dechow et al., 1995).	Compustat
Lev	The firm's long-term debt (*dltt*) divided by long-term debt plus common equity (*dltt* + *ceq*).	Compustat
LnAge	Natural logarithm of one plus the number of years since the firm appears in the CRSP monthly file.	CRSP
LnAnalyst	Natural logarithm of one plus the number of analysts recorded in I/B/E/S that issue annual earnings forecasts for the firm during the fiscal year.	I/B/E/S
PC	An indicator variable capturing political connection, equal to one for firms that register a PAC in November of the fiscal year, zero otherwise.	FEC
PU	Following Francis et al. (2014), political uncertainty is the an augmented Fama and French (1993) three factor model with percentage change of political conditions using the Poltical Uncertainty Index compiled by Baker et al. (2011). PU is an indicator variable equal to one for observations above the median of the coefficient of political conditions in the above model, and zero otherwise.	CRSP/Political Uncertainty Index

Appendix A
Definition and Measurement of Variables

Variables	*Definition and Measurement*	*Source*
Rd	The firm's research and development expenditures (*xrd*) scaled by prior year total assets (*at*). Missing values are replaced with zero.	Compustat
Ret	The contemporaneous stock returns in the fiscal year calculated using CRSP monthly return data.	CRSP
Roa	The firm's earnings before extraordinary and discontinued items (*ib*) scaled by prior year's total assets (*at*).	Compustat
Seg_bus	Natural logarithm of one plus the number of firm's business segments.	Compustat Segment File
Seg_geo	Natural logarithm of one plus the number of firm's geographic segments.	Compustat Segment File
Sgrowth	The firm's current year's sales ($sale_t$) less prior year's sales ($sale_{t-1}$), divided by prior year's sales.	Compustat
Size	Natural logarithm of the firm's market value (*prcc_f* × *chso*), measured at the beginning of the fiscal year.	Compustat
Std_earn	Standard deviation of earnings scaled by total assets (*ni/at*) calculated using data from the last five years.	Compustat
Std_ret	The stock return volatility calculated using 12 months of monthly return data before the fiscal year end date.	CRSP
Subsidy	Natural logarithm of one plus the dollar amount of all subsidies the firm receives during the fiscal year.	Subsidy Tracker
Tax Subsidy	Natural logarithm of one plus the dollar amount of tax subsidies the firm receives during the fiscal year.	Subsidy Tracker
Non-Tax Subsidy	Natural logarithm of one plus the dollar amount of non-tax subsidies the firm receives during the fiscal year.	Subsidy Tracker
Tone	The difference between the number of positive and negative words, scaled by the aggregate number of positive and negative words from the MD&A section of 10K filings.	10K filings

Table 1
Propensity Score Matching Estimation and Diagnostics

Panel A: Propensity Score Estimation

	Subsidy
Size	0.391***
	(37.31)
Lev	0.138***
	(3.41)
ROA	0.480***
	(4.49)
Rd	0.452**
	(2.19)
Foreignsales	-0.487***
	(-11.82)
Employees	0.222***
	(19.99)
Election_year	-0.002
	(-0.07)
Constant	-5.169***
	(-24.32)
Year fixed effects	Yes
Industry fixed effects	Yes
No. of observations	61,362
Pseudo R^2	0.457

Panel B: Covariate & Main Variables Mean Differences

	Full Sample			*Propensity-Score Matched Sample:*		
	Subsidy Firms	Non-Subsidy Firms	Difference in Means (t-statistic)	Subsidy Firms	Non-Subsidy Firms	Difference in Means (t-statistic)
Size	8.418	5.118	128.98***	8.312	8.388	-2.75***
Lev	0.310	0.231	21.07***	0.310	0.311	-0.19
ROA	0.065	-0.061	31.64***	0.064	0.066	-1.33
Rd	0.031	0.069	-22.57***	0.031	0.031	-0.39
Foreignsales	0.340	0.199	37.04***	0.334	0.333	0.18
Employees	2.748	-0.213	110.09***	2.664	2.717	-1.94*
Election_year	0.221	0.222	-0.16	0.222	0.222	-0.07

Panel C: Overall Measures of Covariate Imbalance

	Pseudo R2	LR chi2	Mean Bias	Median Bias	Rubins' B	Rubins' R
Unmatched Sample	0.378	14687.62	77.0	50.3	198.7	0.54
Matched Sample	0.001	10.12	1.4	0.4	6.0	0.82

Notes: This table presents in panel A the first stage model used for estimating propensity scores, in panel B the covariate mean differences after propensity score matching and in Panel C the overall measures of covariate imbalance. The model is estimated using logistic regression with t-statistics reported in parentheses based on standard errors corrected for heteroskedasticity, and clustered by year. The extreme values of all continuous variables are winsorized at the 1 and 99 percentiles. Definition and measurement of variables are presented in Appendix A. *, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

Table 2
Summary Statistics

Panel A: Summary statistics for variables used in the main analysis

Variable	N	Mean	P25	Median	P75	Std
IS	8,982	0.536	0.300	0.550	0.750	0.260
IS_JSY	8,982	0.534	0.300	0.500	0.800	0.284
IS_TZ	8,982	0.539	0.300	0.500	0.800	0.288
Tone	4,646	-0.282	-0.415	-0.295	-0.158	0.202
Subsidy	8,982	0.435	0.000	0.014	0.446	0.830
Tax subsidy	8,982	0.243	0.000	0.000	0.167	0.547
Non-tax subsidy	8,982	0.188	0.000	0.000	0.081	0.479
Size	8,982	8.146	7.188	8.078	9.116	1.476
Sgrowth	8,982	0.113	0.030	0.080	0.153	0.149
Lev	8,982	0.314	0.128	0.293	0.437	0.246
ROA	8,982	0.066	0.032	0.064	0.104	0.073
Invint	8,982	0.889	0.712	0.898	1.042	0.307
Btm	8,982	0.594	0.419	0.587	0.769	0.228
Std_Earn	8,794	0.052	0.019	0.032	0.063	0.056
LnAnalyst	8,982	2.379	1.977	2.488	2.887	0.687
LnAge	8,982	3.005	2.450	3.026	3.674	0.869

Panel B: Univariate analysis for income smoothing variables

	Pre-matched Sample			*Propensity-Score Matched Sample:*		
	Subsidy Firms	Non-Subsidy Firms	Difference in Means	Subsidy Firms	Non-Subsidy Firms	Difference in Means
	(1)	(2)	(3)	(4)	(5)	(6)
IS	0.624	0.542	-0.08***	0.553	0.541	-0.01**
IS_TZ	0.612	0.543	-0.07***	0.551	0.543	-0.08
IS_JSY	0.636	0.541	-0.09***	0.554	0.540	-0.01**

Notes: This table presents the descriptive statistics for the variables used in the main empirical analysis (Panel A) and mean differences for income smoothing (Panel B). Definition and measurement of variables are presented in Appendix A.

Table 3
Correlation Matrix of Main Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
IS		**0.919**	**0.917**	**0.135**	**0.084**	**0.072**	**0.068**	**0.142**	**0.025**	**0.076**	**0.270**	**-0.092**	**0.057**	**-0.467**	**0.103**	**0.129**
IS_TZ	**0.918**		**0.687**	**0.140**	**0.067**	**0.055**	**0.055**	**0.119**	**0.011**	**0.056**	**0.278**	**-0.092**	**0.063**	**-0.480**	**0.085**	**0.133**
IS_JSY	**0.918**	**0.686**		**0.107**	**0.088**	**0.077**	**0.069**	**0.141**	**0.035**	**0.083**	**0.218**	**-0.077**	**0.040**	**-0.379**	**0.104**	**0.104**
Tone	**0.121**	**0.128**	**0.094**		**0.086**	**0.078**	**0.078**	**0.121**	**0.137**	-0.003	**0.234**	**0.100**	**-0.172**	**-0.183**	**0.117**	**0.066**
Subsidy	**0.059**	**0.043**	**0.065**	**0.062**		**0.883**	**0.870**	**0.419**	**-0.054**	**0.169**	**0.186**	**-0.098**	**-0.048**	**-0.252**	**0.362**	**0.205**
Tax subsidy	**0.042**	**0.026**	**0.051**	**0.058**	**0.776**		**0.697**	**0.384**	**-0.061**	**0.169**	**0.169**	**-0.089**	**-0.040**	**-0.233**	**0.330**	**0.198**
Non-tax subsidy	**0.048**	**0.037**	**0.052**	**0.053**	**0.779**	**0.455**		**0.362**	**-0.053**	**0.151**	**0.157**	**-0.090**	**-0.036**	**-0.217**	**0.314**	**0.202**
Size	**0.142**	**0.118**	**0.142**	**0.120**	**0.339**	**0.304**	**0.264**		**0.072**	**0.188**	**0.359**	**-0.029**	**-0.304**	**-0.342**	**0.870**	**0.155**
Sgrowth	0.001	-0.004	0.007	0.001	-0.006	-0.005	-0.004	-0.004		**-0.045**	**0.046**	**0.422**	**-0.346**	**0.222**	**0.161**	**-0.281**
Lev	**0.019**	-0.002	**0.038**	**-0.034**	**0.082**	**0.077**	**0.059**	**0.123**	0.002		**0.012**	**-0.357**	**0.201**	**-0.266**	**0.158**	**0.113**
ROA	**0.206**	**0.211**	**0.167**	**0.085**	**0.076**	**0.073**	**0.055**	**0.258**	**-0.037**	**0.026**		**-0.119**	**-0.078**	**-0.499**	**0.302**	**0.229**
Invint	-0.008	**-0.010**	-0.005	-0.009	-0.002	-0.002	-0.001	-0.007	0.000	0.010	-0.057		**-0.457**	**0.428**	**0.051**	**-0.250**
BTM	**0.044**	**0.054**	**0.028**	**-0.165**	**-0.034**	**-0.027**	**-0.022**	**-0.323**	**-0.014**	**0.057**	**0.212**	-0.006		**-0.278**	**-0.297**	**0.131**
Std_Earn	**-0.020**	**-0.019**	**-0.018**	**-0.015**	-0.006	-0.005	-0.005	**-0.016**	0.001	**0.011**	**-0.065**	**0.608**	**-0.012**		**-0.241**	**-0.368**
LnAnalyst	**0.107**	**0.088**	**0.108**	**0.109**	**0.257**	**0.228**	**0.197**	0.865	0.000	**0.094**	**0.231**	-0.008	**-0.306**	**-0.018**		**0.021**
LnAge	**0.128**	**0.131**	**0.104**	**0.058**	**0.178**	**0.154**	**0.171**	**0.211**	**-0.031**	**0.072**	**0.223**	**-0.014**	**0.108**	**-0.032**	**0.064**	

Notes: This table presents the correlation coefficients for the variables used in the main empirical analysis. Spearman correlation coefficients are presented above the diagonal; Pearson correlations are presented below the diagonal. Correlations in bold denoted significance at 10% level or better. Definition and measurement of variables are presented in Appendix A.

Table 4
The impact of government subsidy on income smoothness

	IS	*IS_TZ*	*IS_JSY*
	(1)	(2)	(3)
Subsidy	0.0069***	0.0073***	0.0065*
	(3.58)	(3.18)	(2.07)
Size	0.0049	-0.0072*	0.0170***
	(1.38)	(-1.86)	(3.61)
Sgrowth	0.3437***	0.3024***	0.3851***
	(10.69)	(8.73)	(10.85)
Lev	-0.0232	-0.0326*	-0.0139
	(-1.38)	(-1.78)	(-0.76)
ROA	0.2827***	0.2721***	0.2933***
	(4.24)	(4.35)	(3.64)
Invint	-0.0780***	-0.0540***	-0.1020***
	(-4.82)	(-3.02)	(-5.47)
Btm	0.0385	-0.0020	0.0790**
	(1.17)	(-0.06)	(2.32)
Std_Earn	-1.8763***	-2.2736***	-1.4789***
	(-29.25)	(-24.98)	(-25.98)
LnAnalyst	-0.0135***	-0.0033	-0.0236***
	(-3.20)	(-0.60)	(-4.00)
LnAge	-0.0039	-0.0025	-0.0052
	(-1.26)	(-0.72)	(-1.43)
Constant	0.3210***	0.3402***	0.3019***
	(8.17)	(5.54)	(5.70)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes
No. of observations	8,794	8,794	8,794
Adjusted R^2	0.223	0.234	0.151

Notes: This table presents the regression results of the impact of subsidy on firms' income smoothness. T-statistics reported in parentheses are based on standard errors corrected for heteroskedasticity, and clustered by year. The extreme values of all continuous variables are winsorized at the 1 and 99 percentiles. Definition and measurement of variables are presented in Appendix A. *, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

Table 5
The impact of tax and non-tax subsidy on income smoothness

	IS			*IS_TZ*			*IS_JSY*		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Tax subsidy	0.0001		-0.0044	-0.0028		-0.0076*	0.0030		-0.0011
	(0.05)		(-1.47)	(-0.77)		(-1.76)	(0.69)		(-0.23)
Non-tax subsidy		0.0149***	0.0164***		0.0151**	0.0177**		0.0147***	0.0150***
		(3.52)	(3.34)		(2.58)	(2.67)		(3.09)	(2.93)
Size	0.0062*	0.0051	0.0055	-0.0055	-0.0069*	-0.0062	0.0179***	0.0172***	0.0173***
	(1.78)	(1.49)	(1.59)	(-1.35)	(-1.81)	(-1.52)	(3.97)	(3.76)	(3.83)
Sgrowth	0.3515***	0.3452***	0.3474***	0.3125***	0.3042***	0.3081***	0.3905***	0.3861***	0.3867***
	(11.01)	(10.64)	(10.84)	(9.03)	(8.78)	(8.94)	(11.13)	(10.64)	(10.94)
Lev	-0.0238	-0.0226	-0.0224	-0.0331*	-0.0320*	-0.0316	-0.0145	-0.0133	-0.0132
	(-1.42)	(-1.34)	(-1.32)	(-1.82)	(-1.75)	(-1.73)	(-0.80)	(-0.72)	(-0.72)
ROA	0.2815***	0.2901***	0.2924***	0.2718***	0.2795***	0.2836***	0.2912***	0.3006***	0.3012***
	(4.21)	(4.31)	(4.35)	(4.36)	(4.39)	(4.46)	(3.61)	(3.71)	(3.72)
Invint	-0.0812***	-0.0792***	-0.0802***	-0.0582***	-0.0554***	-0.0571***	-0.1042***	-0.1030***	-0.1033***
	(-5.03)	(-4.92)	(-5.04)	(-3.28)	(-3.20)	(-3.30)	(-5.57)	(-5.40)	(-5.54)
Btm	0.0420	0.0388	0.0398	0.0027	-0.0015	0.0003	0.0814**	0.0791**	0.0794**
	(1.29)	(1.18)	(1.22)	(0.08)	(-0.04)	(0.01)	(2.43)	(2.35)	(2.36)
Std_earn	-1.8731***	-1.8737***	-1.8723***	-2.2693***	-2.2709***	-2.2683***	-1.4770***	-1.4765***	-1.4762***
	(-29.51)	(-29.19)	(-29.34)	(-25.14)	(-24.82)	(-24.91)	(-26.29)	(-26.12)	(-26.43)
LnAnalyst	-0.0138***	-0.0137***	-0.0138***	-0.0037	-0.0035	-0.0037	-0.0238***	-0.0238***	-0.0239***
	(-3.24)	(-3.23)	(-3.24)	(-0.65)	(-0.64)	(-0.66)	(-4.07)	(-4.01)	(-4.04)
LnAge	-0.0037	-0.0043	-0.0043	-0.0024	-0.0030	-0.0030	-0.0051	-0.0056	-0.0056
	(-1.19)	(-1.39)	(-1.38)	(-0.66)	(-0.82)	(-0.82)	(-1.39)	(-1.56)	(-1.56)
Constant	0.3123***	0.3262***	0.3259***	0.3298***	0.3450***	0.3445***	0.2948***	0.3074***	0.3073***
	(8.30)	(8.18)	(8.24)	(5.44)	(5.56)	(5.59)	(5.77)	(5.88)	(5.90)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	8,794	8,794	8,794	8,794	8,794	8,794	8,794	8,794	8,794
Adjusted R^2	0.222	0.223	0.223	0.224	0.224	0.224	0.151	0.151	0.151

Notes: This table presents the regression results of the impact of tax and non-tax subsidy on firms' income smoothness. T-statistics reported in parentheses are based on standard errors corrected for heteroskedasticity, and clustered by year. The extreme values of all continuous variables are winsorized at the 1 and 99 percentiles. Definition and measurement of variables are presented in Appendix A. *, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

Table 6
The impact of state-level corruption on the relation between subsidy and income smoothness

	Dependent variable: IS			
	Low corruption	*High corruption*	*Low corruption*	*High corruption*
	(1)	(2)	(3)	(4)
Subsidy	0.0039	0.0112***		
	(1.32)	(3.28)		
		[3.67**]		
Tax subsidy			-0.0070	0.0005
			(-1.23)	(0.08)
				[-1.57]
Non-tax subsidy			0.0061	0.0267***
			(0.87)	(2.94)
				[-3.95**]
Size	0.0024	0.0043	0.0036	0.0048
	(0.50)	(0.71)	(0.76)	(0.77)
Sgrowth	0.3315***	0.3618***	0.3368***	0.3644***
	(8.35)	(7.98)	(8.37)	(8.10)
Lev	-0.0062	-0.0333*	-0.0062	-0.0315
	(-0.23)	(-1.76)	(-0.23)	(-1.67)
ROA	0.2512***	0.3264***	0.2569***	0.3376***
	(2.92)	(3.90)	(2.91)	(4.08)
Invint	-0.1060***	-0.0509**	-0.1083***	-0.0534**
	(-5.32)	(-2.12)	(-5.37)	(-2.22)
Btm	0.0268	0.0492	0.0309	0.0479
	(0.60)	(1.65)	(0.71)	(1.57)
Std_earn	-1.8267***	-1.8710***	-1.8212***	-1.8701***
	(-19.54)	(-20.53)	(-19.48)	(-20.76)
LnAnalyst	-0.0120	-0.0087	-0.0123	-0.0099
	(-1.53)	(-1.02)	(-1.57)	(-1.12)
LnAge	-0.0085	0.0025	-0.0084	0.0016
	(-1.35)	(0.50)	(-1.33)	(0.31)
Constant	0.7507***	0.6596***	0.7378***	0.6585***
	(5.78)	(6.10)	(5.67)	(6.16)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes
No. of observations	4,623	4,171	4,623	4,171
Adjusted R^2	0.223	0.239	0.223	0.240

Notes: This table presents the sub-sample regression results of the relation between subsidy and income smoothness. The full sample is divided into firm-years from low/high corruption states. Low/high corruption states are those with scores lower/higher than the median score of corruption based on the Report to Congress on the Activities and Operations of the US Department of Justice Public Integrity Section. T-statistics reported in parentheses are based on standard errors corrected for heteroskedasticity, and clustered by year. F-statistics reported in brackets denotes one-side test of equality of coefficients. The extreme values of all continuous variables are winsorized at the 1 and 99 percentiles. Definition and measurement of variables are presented in Appendix A. *, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

Table 7
The impact of political connections on the relation between subsidy and income smoothness

	Dependent variable: IS			
	PC = 0	*PC = 1*	*PC = 0*	*PC = 1*
	(1)	(2)	(3)	(4)
Subsidy	-0.0009	0.0186***		
	(-0.26)	(4.18)		
		[-20.00***]		
Tax subsidy			-0.0135***	0.0067
			(-3.96)	(0.87)
				[-7.52***]
Non-tax subsidy			0.0059	0.0314***
			(0.97)	(2.88)
				[-7.48***]
Size	0.0035	0.0017	0.0040	0.0048
	(0.82)	(0.18)	(0.94)	(0.47)
Sgrowth	0.3901***	0.1553**	0.3931***	0.1680***
	(9.72)	(2.86)	(9.73)	(3.12)
Lev	-0.0471**	0.0683*	-0.0465**	0.0707*
	(-2.37)	(1.89)	(-2.33)	(2.00)
ROA	0.2115***	0.6602***	0.2169***	0.6748***
	(3.45)	(3.82)	(3.50)	(3.96)
Invint	-0.0968***	-0.0054	-0.0994***	-0.0123
	(-5.02)	(-0.17)	(-5.17)	(-0.39)
Btm	0.0449	0.0739*	0.0461	0.0736*
	(1.24)	(1.88)	(1.29)	(1.88)
Std_earn	-1.8704***	-1.9548***	-1.8699***	-1.9376***
	(-32.09)	(-9.30)	(-31.86)	(-9.25)
LnAnalyst	-0.0113*	-0.0275	-0.0112*	-0.0335
	(-1.97)	(-1.31)	(-1.94)	(-1.48)
LnAge	-0.0046	0.0211*	-0.0047	0.0188*
	(-1.32)	(1.96)	(-1.33)	(1.81)
Constant	1.0049***	0.7359***	-0.0135***	0.0067
	(3.14)	(5.80)	(-3.96)	(0.87)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes
No. of observations	6,805	1,989	6,805	1,989
Adjusted R^2	0.233	0.290	0.234	0.290

Notes: This table presents the sub-sample regression results of the relation between subsidy and income smoothness. The full sample is divided into firm-years with/without political connections. T-statistics reported in parentheses are based on standard errors corrected for heteroskedasticity, and clustered by year. Z-statistics reported in brackets denotes one-side test of equality of coefficients. The extreme values of all continuous variables are winsorized at the 1 and 99 percentiles. Definition and measurement of variables are presented in Appendix A. *, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

Table 8
The impact of political uncertainty on the relation between subsidy and income smoothness

	Dependent variable: IS			
	PU = 0	*PU = 1*	*PU = 0*	*PU = 1*
	(1)	(2)	(3)	(4)
Subsidy	0.0039	0.0154***		
	(1.53)	(3.23)		
		[-5.40***]		
Tax subsidy			-0.0073*	0.0007
			(-1.84)	(0.06)
				[-1.30]
Non-tax subsidy			0.0116*	0.0330***
			(2.06)	(2.99)
				[-4.41***]
Size	0.0098**	-0.0136*	0.0106***	-0.0132*
	(2.84)	(-1.76)	(3.12)	(-1.76)
Sgrowth	0.3672***	0.3021***	0.3717***	0.3059***
	(8.18)	(8.14)	(8.26)	(8.23)
Lev	-0.0292	0.0174	-0.0290	0.0211
	(-1.53)	(0.73)	(-1.51)	(0.85)
ROA	0.2265***	0.4312***	0.2314***	0.4621***
	(2.89)	(3.31)	(2.95)	(3.58)
Invint	-0.0870***	-0.0583**	-0.0891***	-0.0618**
	(-4.51)	(-2.26)	(-4.61)	(-2.43)
Btm	0.0509	0.0381	0.0517	0.0431
	(1.45)	(0.92)	(1.48)	(1.04)
Std_earn	-2.0339***	-1.5010***	-2.0338***	-1.4845***
	(-22.26)	(-13.81)	(-22.37)	(-13.33)
LnAnalyst	-0.0179**	0.0012	-0.0184**	0.0013
	(-2.72)	(0.10)	(-2.77)	(0.11)
LnAge	-0.0082*	0.0058	-0.0087*	0.0054
	(-1.76)	(0.84)	(-1.81)	(0.77)
Constant	0.5817***	1.0786***	0.5769***	1.0841***
	(8.97)	(3.26)	(8.83)	(3.28)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes
No. of observations	6,465	1,989	6,805	1,989
Adjusted R^2	0.215	0.250	0.215	0.251

Notes: This table presents the sub-sample regression results of the relation between subsidy and income smoothness. The full sample is divided into firm-years with/without political connections. T-statistics reported in parentheses are based on standard errors corrected for heteroskedasticity, and clustered by year. Z-statistics reported in brackets denotes one-side test of equality of coefficients. The extreme values of all continuous variables are winsorized at the 1 and 99 percentiles. Definition and measurement of variables are presented in Appendix A. *, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).

Table 9
The impact of subsidy on disclosure tone

	Dependent variable = Tone			
	(1)	(2)	(3)	(4)
Subsidy	0.0257***			
	(9.38)			
Tax subsidy		0.0309***		0.0203***
		(5.88)		(3.16)
Non-tax subsidy			0.0389***	0.0326***
			(10.11)	(7.72)
Earn	0.0672*	0.0450	0.0874**	0.0729*
	(1.83)	(1.17)	(2.47)	(2.04)
Ret	0.1062***	0.1082***	0.1059***	0.1059***
	(5.20)	(5.31)	(5.25)	(5.27)
Size	-0.0042	-0.0026	-0.0018	-0.0041
	(-0.93)	(-0.51)	(-0.42)	(-0.85)
Btm	-0.2010***	-0.1995***	-0.1961***	-0.2020***
	(-13.47)	(-13.60)	(-13.75)	(-13.28)
Std_ret	-0.3277*	-0.3077*	-0.2979*	-0.3321*
	(-1.99)	(-1.78)	(-1.78)	(-1.96)
Std_earn	-0.3445***	-0.3462***	-0.3413***	-0.3460***
	(-6.12)	(-6.17)	(-6.27)	(-6.20)
LnAge	-0.0284***	-0.0281***	-0.0298***	-0.0295***
	(-5.14)	(-5.08)	(-5.32)	(-5.29)
Seg_bus	0.0325	0.0352*	0.0300	0.0283
	(1.71)	(1.86)	(1.55)	(1.47)
Seg_geo	-0.0392***	-0.0408***	-0.0435***	-0.0422***
	(-2.90)	(-3.06)	(-3.28)	(-3.11)
Constant	0.6294***	0.5986***	0.6146***	0.6432***
	(12.84)	(11.85)	(12.75)	(12.62)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes
No. of observations	4,960	4,960	4,960	4,960
Adjusted R^2	0.228	0.228	0.228	0.228

Notes: This table presents the regression results of the impact of subsidy on firms' disclosure tone. T-statistics reported in parentheses are based on standard errors corrected for heteroskedasticity, and clustered by year. The extreme values of all continuous variables are winsorized at the 1 and 99 percentiles. Definition and measurement of variables are presented in Appendix A. *, **, *** denote significant at the 10 percent, 5 percent, and 1 percent levels respectively (two-tailed).