Capital Structure: Debt, Equity, and Government Subsidies

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The capital structure literature traditionally focuses on the choice of debt versus equity. I expand this view by examining whether firms treat government incentives and subsidies as a third source of external capital to finance operations. I find corporations in the highest decile of size-adjusted government subsidies received have significantly and substantively lower book and market leverage ratios than those in the bottom decile. Further, only direct government subsidies like cash grants, but not loans or indirect tax subsidies like property tax relief, are negatively associated with firm debt ratios. This suggests firms use direct government subsidies as an alternative source of capital consistent with the pecking order theory of capital structure. Additionally, I find firms with lower debt ratios have higher investment commitments to governments, implying subsidies often create off-balance sheet financing. My study expands the capital structure literature by providing evidence that firms use debt, equity, and government subsidies in their capital structure decisions.

Keywords: Capital structure; Government subsidies; Disclosure

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1. Introduction

In this study, I test whether firms use government subsidies as an alternative source of funds in their capital structure decisions. The capital structure literature traditionally views external firm financing as a choice between debt and equity. However, federal, state, and local subsidies have long been a tool used by governments to incentivize business operation and location decisions, and governments have become more aggressive in using subsidies in recent years, which has drawn increased attention from the media, corporations, and regulators (Story 2012) [1]. Today, estimated annual corporate subsidies and incentives from local governments exceed $80 billion, with each state offering some form of incentive (Story, Fehr, and Watkins 2012; Chi and Leatherby 1997). The increasing prevalence and magnitude of government subsidies might lead corporations to view them not simply as a marginal incentive for doing business in a particular location but as a separate and alternative source of capital.[2]

Understanding whether government subsidies influence capital structure decisions is important for at least three reasons. First, if government subsidies significantly affect firm financing decisions, they can help explain the incomplete theoretical models of capital structure choice. Graham and Leary (2011) state, the "extant research has explained only a portion of observed capital structure behavior," and that more work is needed to identify firm characteristics missing from current models. The literature focuses broadly on two traditional capital structure theories: the trade-off theory and the pecking order theory. The trade-off theory asserts firms have an optimal leverage ratio based on taxes, bankruptcy risk, and other costs, so they trade off the costs and benefits of debt and equity (Kraus and Litzenberger 1973; Bradley,

[1] In the United States, government incentive programs arose as early as 1791 when a capital investment group led by Alexander Hamilton offered tax incentives to locate manufacturing operations in New Jersey (Bernstein 1984).
[2] Federal corporate subsidies rose from $65 billion in 1997 to $87 in 2001, an increase of more than 30% (Slivinski 2001). By 2012, federal corporate subsidies were almost $100 billion a year (DeHaven, 2012). These figures do not include the estimated $80 billion of subsidies from state and local governments.

Jarrell, and Kim 1984). According to the trade-off theory, government subsidies and capital structure should be positively related because a government subsidy reduces a firm's cost of debt by decreasing the deadweight costs of bankruptcy. Alternatively, the pecking order theory asserts information asymmetry between the firm and capital providers introduces adverse selection costs that are sufficiently large to induce firms to finance operations using funds with the least information asymmetry first (i.e. internal funds, then debt, and then equity) (Myers 1984). I assert information asymmetry costs are lower for government subsidies than debt because subsidies commonly do not have mandatory performance qualifications for the receiving companies. Therefore, a finding that firms that receive larger government subsidies have lower leverage is more consistent with the pecking order theory, such that firms fund operations with internal funds and government subsidies before seeking debt or equity financing.

Second, the sheer magnitude of government subsidies makes understanding their effects on corporate decisions important. With estimated annual state and local (federal) subsidies exceeding $80 ($90) billion, "incentives have become the cost of doing business with almost every business" for governments (Story et al. 2012). To compete for business, governments offer a range of subsidies, including direct government grants, indirect non-income tax relief, and subsidized loans.[3] Additionally, it is not solely large corporations that receive these subsidies: "(t)he (New York) Times found that the awards go to companies big and small, those gushing in profits and those sinking in losses, American companies and foreign companies, and every industry imaginable" (Story et al. 2012). Therefore, government subsidies have the potential to affect the capital structure for all firms.

[3] I refer the different types of government assistance programs collectively as ""subsidies," throughout the manuscript whenever possible, although, when citing other work, I sometimes use "assistance" or "incentives.". Appendix A lists the different types of subsidy programs included in my sample and how I classify them for analysis.

Finally, the Financial Accounting Standards Board (FASB) is currently debating "Disclosures by Business Entities about Government Assistance," Topic 832. This proposed standard would require firms to disclose the government subsidies they receive. I seek to inform standard-setters and regulators by investigating whether and how different types of subsidies affect corporate decisions. I consider a broad range of subsidies, including direct grants, loans, and various forms of tax relief such as property tax or income tax rate reductions. Understanding the different types of subsidies and how they are used by corporations will help the FASB produce a standard that is more informative to financial statement users.

I use a large dataset of government subsidies provided to corporations collected by Good Jobs First (GJF) to test the relationship between government subsidies and firm capital structure, GJF is a nonprofit group dedicated to promoting government transparency and accountability in economic development by tracking government subsidies (Aobdia, Koester, Petacchi 2018; Drake, Hess, Wilde, Williams 2018; Raghunandan 2017; Huang 2018).[4] GJF obtains data on government awards provided to companies from official federal, state, and local online sources, via formal filings and informal inquiries made to government agencies. These data are not disclosed through firms' public financial filings.[5]

I aggregate the subsidies firms receive at the parent entity and create a size-adjusted decile ranking of subsidy receipts, following prior research using decile rankings (e.g. Sloan 1996 and Drake et al. 2018).[6] I then test whether government subsidies awarded during year *t* affect a firm's capital structure measured at the end of year *t*, by examining their effect on a

[4] The Good Jobs First Subsidy Tracker database is available at https://www.goodjobsfirst.org/subsidy-tracker.
[5] The Government Accounting Standards Board does require state and local governments to disclose corporate tax abatements for periods beginning after December 15, 2015, however, the disclosures are aggregated at the jurisdiction level and do not detail individual amounts or which corporations receive them. Statement No. 77 of the Governmental Accounting Standards Board
[6] I use a decile rank for expositional ease in interpreting coefficient magnitudes. The results are qualitatively similar if I use the ratio of the government subsidy deflated by firm assets. I tabulate these results in robustness tests.

firm's book leverage, net book leverage, market leverage, net market leverage, and interest-to-earnings ratio, controlling for known determinants of leverage such as tangibility, profitability and size (Frank and Goyal 2009).

I find government subsidies are negatively associated with all five measures of firm leverage, consistent with government subsidies affecting firm capital structure. Firms in the top decile of government subsidy receipts have book (market) leverage ratios 3.2 (2.5) percentage points lower than those in the lowest decile. Consistent with that result, I also find the top-decile firms have an interest-to-earnings ratio that is 4.6 percentage points lower, which means they are better able to service their debt with current earnings. These results are consistent with firms substituting debt with government subsidies. This evidence is more consistent with the pecking order theory of capital structure than with the trade-off theory and suggests that firms use internal funds and government subsidies before issuing debt or equity.

Next, I examine whether the association depends on the type of government subsidy received. Government subsidy programs can be classified into three broad groups: direct subsidies, indirect subsidies, and subsidized loans. Direct subsidies are those paid directly to the corporation in the form of a grant or cost reimbursement. These types of subsidies are more likely to be directly and individually negotiated between the corporation and government agency, and less likely to be part of a broad program that is equally available to all companies. Firms are more likely consider direct subsidies when making capital structure decisions as they generally negotiate for grants during project development and receive funds before asset deployment begins. Indirect subsidies are tax relief programs that reduce a corporation's non-income based taxes such as property, payroll, or sales. Indirect subsidies do provide a financial benefit to the receiving firm but the benefit is not received until after asset deployment. Moreover, the benefit

is more heavily dependent on firm performance—for example, the benefit of a payroll tax reduction is contingent on the number of persons employed by a firm. These characteristics make it less likely firms use indirect subsidies as an alternative source of capital when developing financing for a project. Subsidized loans make up the smallest category of government subsidies in terms of raw dollars. Governments sometimes package together multiple subsidy types as part of a larger incentive package called "megadeals" in the GJF dataset.

I find the association between capital structure and government subsidies depends on the type of subsidy offered. Firms in the top decile of direct subsidies have book and market leverage ratios that are significantly lower by 2.9 and 3.1 percentage points. I do not find consistent statistically significant relationships with any other type of government subsidy despite indirect and megadeal subsidies being roughly equivalent to or larger than direct subsidies in terms of both raw dollars and as a percentage of firm assets. If all government funds were viewed as a replacement for external capital, I would have expected to find a statistically significant relationship with all types of government subsidies. This suggests firms negotiate direct subsidies with the intent of using the government subsidy in preference to external debt or equity financing consistent with the pecking order theory.[7]

Next, I test whether firms with lower debt ratios have higher investment commitments to government agencies. To ensure a subsidy achieves its goal of benefiting the local economy, some government agencies require firms to make investment commitments within the jurisdiction, and, if the commitments are not met, some or all of the subsidy must be repaid. To the extent the financial benefit of a subsidy depends on fulfilling a commitment, the commitment

[7] Because firms do not separately disclose government and private debt, I am unable precisely determine whether firms use government debt in lieu of private debt. However, because government loans have presumably a lower cost of capital than private debt, I should find a positive relationship between measures of gross leverage and government bonds/loans according to the trade-off theory. Finding no association further supports the pecking order theory.

represents an undisclosed, off-balance sheet liability to the firm as they need not disclose the commitments under current GAAP reporting requirements. *Ex ante,* it is not clear that all jurisdictions require investment commitments commensurate with the subsidy amounts, which would be necessary to make commitments a reliable predictor of a firm's leverage. However, I find that commitments to job creation are negatively associated with firm debt ratios, which is consistent with government subsidies having an associated, off-balance sheet liability.

Finally, to determine why certain types of government subsidies affect leverage but others do not, I investigate how government subsidies affect firm capital investment. Government subsidies can cause a decrease in leverage if they allow firms to acquire assets without incurring additional debt. I find firms that receive the most government subsidies have statistically, but modestly, higher capital expenditures in the next period, but only for direct subsidies. Moving from the bottom to the top decile of direct subsidies explains spending 0.4 percent of assets more on future capital expenditures, representing about nine percent of the average annual spending on capital expenditures in my sample. This result is consistent with firms seeking direct government subsidies as an alternative source of funds when financing their capital expenditures.

Overall, my results suggest that direct government subsidies do affect firm capital structure and investment decisions. Consistent with the capital structure literature, I acknowledge my study examines the levels of observed firm leverage, which may be affected by unobserved, correlated factors. However, my results highlight the economic significance of government subsidies in capital structure and contributes to our understanding of the between-firm variation in capital structure theory. Additionally, my study provides FASB with empirical evidence about the proposed standard on government assistance (FASB Topic 832 Disclosures by Business

Entities about Government Assistance). My findings speak to the relevance of the proposed standard as governments increasingly use large subsidies to attract corporate business.

2. Background and hypothesis development

A government subsidy is a financial benefit, such as a grant, tax break, or loan, provided to a taxpaying entity to incentivize capital and labor investment in the local economy. Government subsidy programs have been used in the United States as early as 1791, and states and localities continue to tailor subsidies to compete for corporations' business.

Amazon's intent to open a second headquarters (HQ2) in North America provides a prominent example highlighting the competition between localities for corporate business. Amazon estimated it would "hire as many as fifty thousand (50,000) new full-time employees with an average annual total compensation exceeding one hundred thousand dollars ($100,000) over the next ten to fifteen years." The estimates were released as part of Amazon's own Request for Proposal (RFP) in which it detailed preferences for the potential HQ2 location. The RFP invited tax abatements and other incentives: the eight-page RFP references "incentives" twenty one times. Amazon received 238 proposals representing a diverse range of incentives. Calgary, Alberta offered to change the city's name to "Calmazon," Missouri offered to construct a Hyperloop between the state's three largest cities to facilitate a labor force, and New Jersey offered $7 billion in tax incentives.[8] The competition between cities to attract business and the economic magnitude of the incentives involved highlights the importance of studying how government subsidies impact corporations.

[8] On November 13, 2018, Amazon announced New York City and Arlington, Virginia as the locations for its new headquarters. The company said it will create more than 25,000 jobs at each new location. Additionally, Amazon stated it would open a Center of Excellence of its Operations business in Nashville. https://blog.aboutamazon.com/company-news/amazon-selects-new-york-city-and-northern-virginia-for-new-headquarters

The economics and public policy literatures study how government subsidies affect local economies, but evidence on the effects of government subsidies on corporations is limited.[9] Aobdia et al. (2018) show political contributions increase the likelihood of a corporation receiving a government subsidy, suggesting that corporations can influence the decision in their favor. Drake et al. (2018) study a subset of government subsidies to show firms that receive more non-income tax relief have significantly higher future performance, and that the market underweights this information due to an insufficient disclosure environment. Raghunandan (2017) investigates whether firms that receive tax subsidies are more likely to engage in fraud than non-recipient firms, and Huang (2018) demonstrates firms receiving subsidies provide more voluntary disclosure through earnings forecasts and press releases. I add to this emerging literature by examining how government subsidies affect firm capital structure decisions.

Modigliani and Miller (1958) set forth that "capital can be obtained by many different media," suggesting multiple external sources through which firms can finance operations. However, most of the finance literature studies the more limited capital structure choice between debt and equity. The dichotomous choice between borrowing with new loans versus issuing new stock has given rise to several theories as to how firms structure their capital. Modigliani and Miller (1958 and 1963) first proposed the capital structure irrelevance proposition. They theorize a firm's market value function is unaffected by financing choices. However, their model assumes a market devoid of fictions such as taxes, bankruptcy costs, and information asymmetry. To

[9] The economics, finance, and public policy literatures generally focus on whether state and local government economic development policies benefit the local economy. The research is mixed and economic policies continue to be a hotly-debated topic for state and local governments. In a recent review of state and local fiscal policy studies, Rickman and Wang (2018) state "the relative effects of various categories of taxes and expenditures, continue to vary widely across studies," and their conclusion is consistent with that of the early literature – "the jury is still out on whether economic development policies have any effect (on the jurisdiction) at all" (McGuire 1992).

account for these frictions, the capital structure literature focuses broadly on two theories: the trade-off theory and the pecking order theory.[10]

The trade-off theory asserts firms have an optimal leverage ratio that balances various costs such as bankruptcy costs, agency costs, and the loss of non-debt tax shields (e.g. Kraus and Litzenberger 1973; DeAngelo and Masulis 1980; Kim 1982; Bradley et al. 1984). Traditional trade-off predictions are directionally consistent with most of the empirical cross-sectional data such as firm size, tangibility, and growth (Frank and Goyal 2009). However, the theory has certain limitations. Graham and Leary (2011) state, "although directional trade-off patterns are consistent with broad leverage patterns, they explain relatively little of the observed capital structure variation." Additionally, more profitable firms should have higher levels of debt due to the increased value of the tax shield, but there is a negative relationship between profitability and leverage in levels analyses.

Despite the noted shortcomings, if the trade-off theory is correct, I expect government subsidies to be positively related to leverage for several reasons. First, a government subsidy decreases a firm's deadweight cost of bankruptcy by providing it with additional capital or decreasing tax costs. The decrease in bankruptcy costs reduces the cost of debt making debt financing relatively more attractive to the firm. Second, contrary to notion that the government is an "uninvited party to all contracts" (Scholes et al. 2015), a subsidy-granting government agency becomes an *invited* party that has a political and economic interest in the success of the firm. It sends a signal that the government believes the firm will be successful and the government is more likely to offer further support if needed in the future, which should further reduce the cost

[10] See Graham and Leary (2011) for a review of the capital structure literature.

of debt.[11] Third, the tax benefit of the corresponding interest deduction of debt increases the benefit of debt relative to equity.[12] The trade-off theory does not provide support for a negative relationship between government subsidies and leverage.

Myers (1984) and Myers and Majluf (1984) pose an alternative to trade-off theory, the pecking order theory. The models are not entirely mutually exclusive but differ on which market frictions are most significant. The pecking order theory asserts that information asymmetry costs are large enough that firms use the least information-sensitive capital first: internal funds, followed by debt, and then equity. Government subsidies are likely to have lower information asymmetry costs because the subsidies commonly do not have mandatory performance qualifications for the receiving companies. The International City/Management Association (ICMA) found that 45% of US municipalities that offer incentives have no mandatory performance qualifications (ICMA 2009). Even if a municipality does impose a performance condition, they often have less substantial clawback provisions (i.e. covenants) than debt or equity issuers.[13] Therefore, if the pecking order theory is correct, I expect to find a negative association between government subsidies and debt ratios as firms use government subsidies before debt and equity when making capital structure decisions. Due to the competing predictions given by these two theories, I state my first hypothesis in the null form:

H1: Government subsidies do not affect a firm's capital structure.

[11] When G.M. was liquidating over 50 properties in 2009 that had received government subsidies, several jurisdictions offered even more government funds to try and keep the factories and plants open. "Ohio was proposing a $56 million deal to save its Moraine plant, and Wisconsin, fighting for its Janesville factory, offered $153 million" (Story 2012).

[12] My sample period ends in 2016, but the Tax Cut and Jobs Act of 2017 (TCJA) imposes new financing costs beginning in 2018. The TCJA limits the deductibility of net interest expense to 30% of earnings before interest, taxes, depreciation, and amortization (EBITDA) for four years, after which it is limited to 30% of earnings before interest and taxes (EBIT). This limitation will increase the benefit of the debt tax shield for firms receiving government subsidies after 2017, because corporations are more likely to be limited in the amount of interest they can deduct for federal tax purposes. This further strengthens the prediction of a positive relationship (post 2017) between government subsidies and debt given by the trade-off theory.

[13] In a 2012 report, GJF found that 31 percent of government subsidy programs do not independently verify data to determine whether a subsidy recipient is in compliance with program requirements.

The variation in the types of government subsidies offered to corporations is central to the discussion of government incentives. Some subsidies, such as an enterprise zone credit, are equally available to all corporations that operate in specified areas. For example, the California Enterprise Zone Program provides sales and use tax credits and hiring tax credits to firms that operate in one of the 42 qualifying areas. Enterprise Zone subsidies are designed to stimulate growth, create jobs, and attract or retain businesses in particular areas within a state. These types of subsidies can represent significant savings for businesses but are less likely to influence capital structure decisions because subsidies such as property and sales tax abatements are spread and discounted over a number of years, are received after assets are put in place, and less likely to affect current considerations for funding sources.

On the other hand, subsidies like state grants are more frequently individually negotiated and awarded.[14] For example, the Texas Enterprise Fund (TEF) "is a cash grant used as a financial incentive tool for projects that offer significant projected job creation…and where a single Texas site is competing with another viable out-of-state option."[15] Corporations must go through an 11-step process to apply for a TEF grant and, through this process, are more likely to view direct subsidies as an alternative to debt or equity capital. The wide variation in types of subsidies offered is likely to affect the way corporations view them when making capital structure decisions. I expect direct subsidies like federal and state grants are more likely to substitute for debt and equity than are subsidies like enterprise zone credits, because firms can procure the funding at the beginning of a project and can better account for them when calculating financing needs. Direct subsidies are also less likely to depend on future firm performance than an indirect

[14] Negotiations are generally handled by an economic development council as part of the governor's office.
[15] https://businessintexas.com/services/texas-enterprise-fund

subsidy like a sales or use tax abatement. Therefore, I state my second hypothesis in the alternative form:

H2: Direct government subsidies have a larger effect than indirect government subsidies on a firm's capital structure.

3. Data and sample selection

To test my hypotheses, I use a large dataset of federal, state, and local government subsidy awards provided to corporations. Governments provide subsidies to recruit businesses with the objective of improving the local economy by creating new, high-paying jobs and diversifying the economy. This objective is best met when companies provide documentation they met their commitment to create jobs and the government agency confirms the information; however, this is often not the case.[16] To encourage accountability from both government entities and corporations, GJF, a national policy resource center, identifies and gathers information related to federal, state, and local government subsidies. GJF collects subsidy information from official federal, state, and local government online sources, informal requests to the government agency, or formal freedom of information filings. GJF compiles the information to create a novel dataset that provides corporate identifiers and information related to the subsidy (e.g. subsidy amount, anticipated job creation, total payroll commitment). Until these data became available in 2003, older studies in economics or public policy typically analyzed individual, within-state programs or used limited sample sizes.

Although the GJF database provides a comprehensive collection of government subsidy programs, the data is subject to certain limitations. First, government subsidies can be offered as

[16] Dalehite, Mikesell, and Zorn (2005) perform a review of the U.S. property tax abatement programs and find "only 14 of 35 states establish claw-back provisions, and in some this clause might not be enforced," which means corporations are not necessarily required to follow through on the investments they commit to make in the community to receive the government subsidy.

single-year or multi-year deals, and there is no uniform reporting requirement. Therefore, jurisdictions may report the total benefit of multi-year deals in year of the award or as a per-year amount. Second, the economic benefit government subsidies provide can be difficult to measure. For example, a tax increment financing subsidy recognizes property values increase due to improvements from corporate development and allocates the portion of taxes paid on the increased value for further improvements in that zone or returns the taxes to the corporation. The benefit is difficult to calculate because the property value increase has to be estimated before the project begins and needs to distinguish the value change from macroeconomic trends and other concurrent projects. The difficulty in measuring government subsidies introduces noise in the data but is unlikely to bias estimates; however, it does speak to the importance of studying government subsidies as the FASB debates how to disclose and measure government assistance.

Table 1 details my sample selection. The GJF dataset contains information on almost 100,000 government subsidies for which the corporate parent is identified.[17] The data become more complete after 2002 (Raghunandan 2017), so I limit my sample period to the years 2003–2016. I restrict the GJF sample to public companies with a stock ticker, keeping 70,008 affiliate-year observations. I aggregate the subsidy data at the parent-year level and merge with COMPUSTAT, obtaining 9,409 observations. To reduce concerns that government subsidy recipient firms are fundamentally different than non-recipient firms, all firms in my sample period have received some form of government subsidy with each firm included in my sample for an average of 5.6 years.[18] I require my sample of firms to have a simulated marginal tax rate (before interest expense) available from Graham (1996). Finally, I limit my sample to those firms

[17] In total, GJF has collected government subsidy information on over 500,000 subsidy awards but many do not include the parent entity. Subsidies are gathered from all 50 states and Washington D.C.
[18] In untabulated analysis, I treat firm years with missing subsidies as zero, and the results are qualitatively similar.

with non-missing financial variables needed to conduct my main analysis for a final sample of 6,479 firm-years.[19]

Figure 1 shows the number of subsidies as well as the total amount for each year in my sample. The number of subsidies increases from 202 at the start of the sample period in 2003 to 556 in 2016, which reflects the increasing use of subsidies by governments as an incentive tool. The total subsidy amount awarded each year rages from a low of $1.1 billion in 2006 to a high of $21 billion in 2013. The average, per-year total subsidy amount for my sample period is about $6.8 billion, which is small relative to the average debt and equity issuances; however, for firms in the top decile of subsidy receipt, government subsidies represent about six percent of the total funds received from debt or equity issuances.[20]

4. Empirical design and results

4.1 Total government subsidies and firm capital structure

I first examine how government subsidies relate to corporate capital structure. I perform a cross-sectional analysis, consistent with the capital structure literature, because "leverage varies significantly more across firms, as opposed to within firms over time…" (Lemmon, Roberts, and Zender 2008). I estimate the impact of government subsidies on firm capital structure using the following OLS pooled, cross-sectional regression:

$$FIRM\ CAPITAL\ STRUCTURE_{it} = \beta_0 + \beta_1 TOTAL\ SUBSIDY_{it} + \gamma CONTROLS_{it} + \varepsilon_{it}, \quad (1)$$

where the outcome variable is one of five measures of firm capital structure used in the capital structure literature (e.g. Faulkender and Smith 2016). The large capital structure literature uses multiple debt ratios because there is no consensus as to a "correct" measure of leverage (Frank and Goyal 2009). Following other capital structure research, I use multiple definitions of

[19] I set advertising and research and development to zero for firm-years with missing values.
[20] For my sample of firms, the average debt and equity issuances are $730 billion and $66 billion per year. I measure debt issuance as long-term debt issuances plus non-negative changes in current debt.

leverage measured at the end of year *t* to demonstrate the results are robust to alternative measures (e.g. Campello and Giamona 2010; Faulkender and Smith 2016). While my study is consistent with other capital structure studies in measuring leverage at time *t*, it is conceptually different because my variable of interest is measured during the year, instead of at the end of year *t*. Consequently, assuming subsidies are awarded uniformly throughout the year, on average, there is a six-month lag between the subsidy award and leverage measurement date, so the main explanatory variable is arguably independent of the dependent variable.

The first four measures I use to capture capital structure are debt ratios. Book leverage is the sum of short and long-term debt divided by book assets (*BOOK LEV*), and market leverage is the sum of short-term and long-term debt divided by the value of debt plus market value of equity (*MARKET LEV*). I also include the net measures of book leverage (*NET BOOK LEV*) and market leverage (*NET MARKET LEV*), which substitutes the difference between debt and cash plus marketable securities as the numerator of the two leverage measures. [21] Net debt ratios allow for the leverage measure to take a negative value if cash exceeds debt whereas the other two debt ratios are naturally truncated at zero. Additionally, I use the interest-to-earnings ratio defined as the natural log of one plus interest expense divided by earnings before interest and taxes (*INT-TO-EARN*) as an alternative measure of leverage.[22]

My variable of interest, *TOTAL SUBSIDY*, is measured, following Drake et al. (2018), as the decile rank of the ratio of total government subsidies awarded throughout year *t* to total assets.[23] I scale the decile rank to range between 0 and 1 to facilitate the interpretation of the coefficients. A significant coefficient on *TOTAL SUBSIDY* suggests that firms consider

[21] See Appendix B for definitions of all variables.
[22] I adapt this measure from the interest coverage ratio (see Welch 2004 and Faulkender and Petersen 2006) to provide consistent directionality in the estimated coefficients to facilitate ease of interpretation
[23] In robustness tests I use the continuous measures of subsidies scaled by assets and obtain qualitatively similar results.

government subsidies when making capital structure decisions. If negative, it indicates firms substitute government subsidies for external borrowing. The magnitude of the coefficient measures the economic effect of the association.

To examine effect of a specific type of government subsidy, I classify subsidies into one of four categories. First, *DIRECT SUBSIDY* are subsidies paid directly to the corporation in the form of a grant or cost reimbursement. Second, *INDIRECT SUBSIDY* are non-income tax relief programs, which I define following Drake et al. (2018), that reduce a corporation's non-income based taxes (e.g. property, payroll, and sales). Third, *BOND/LOAN SUBSIDY* are defined as programs that provide government subsidies through a government issued bond or loan. The final classification of government subsidies is *MEGADEAL*. Megadeals are separately defined by GJF as multi-faceted subsidy programs where the total state and local cost is $75 million or more. Because megadeals typically include all three types of government subsidies, I cannot classify them separately as *DIRECT SUBSIDY*, *INDRECT SUBSIDY*, or *BOND/LOAN SUBSIDY*.

Equation (1) includes a vector of control variables (*CONTROLS*) for other firm characteristics shown to affect capital structure. I rely on Frank and Goyal's (2009) study of which factors are reliably important in capital structure decisions to select the most common, robust control variables across the capital structure literature. I control for the tax benefit of debt (*MTR*) using John Graham's simulated marginal tax rates available on his website.[24] In a meta-analysis of 48 capital structure studies, Feld, Heckemeyer, and Overesch (2013) find taxes are an

[24] I use the "before-financing" marginal tax rate rather than the "after-financing" rate because it "is not endogenously affected by financing decisions." (Graham, Lemmon, and Schallheim 1998). Graham et al. (1998) construct this variable to measure a firm's marginal tax rate net of all financing decisions. Graham (1996) demonstrates that his simulated tax rates are a better proxy for the marginal tax rate in explaining firm debt levels. Graham and Mills (2008) find the tax rates simulated based on financial statement data are highly correlated with private corporate tax return data. Blouin, Core, and Guay (2010) simulate marginal tax rates using a non-parametric procedure and, using their measure, find firms are less underlevered than previously suggested. Faulkender and Smith (2016) use both the Graham (1996) and Blouin et al. (2010) simulated tax rates and achieve consistent results.

important factor in capital structure choices and the simulated marginal tax rate "avoid(s) a downward bias in estimates for the debt response to tax." I include the book-to-market ratio (*BTM*), advertising to sales (*ADVERTISING*), and research and development to assets (*R&D*), to control for growth expectation and growth opportunities. High-growth firms tend to have low levels of leverage. I control for firm size (*SALES*) measured by the natural logarithm of sales, because large firms commonly have higher leverage because they face lower default risk, which reduces the cost of debt. Firms with more tangible assets tend to have higher leverage because of the higher available collateral, so I include property, plant, and equipment divided by assets (*PPE*). I include earnings before interest and taxes over assets (*ROA*) to control for firm profitability. I include firm age (*AGE*) because more mature firms have a lower default risk and can generally borrow more cheaply and sustain higher leverage. I include depreciation to assets (*DEPRECIATION*) to capture the associated non-debt tax shield following Faulkender and Smith (2016). I include the percentage of equity owned by institutional investors (*INSTITUTIONAL OWNERSHIP*) as the ownership may affect the ability of a firm to procure equity and consequently impact the cost of capital. To the extent firms with high institutional ownership can obtain equity more cheaply they should have lower leverage ratios. I include industry fixed effects at the two-digit SIC code level to control for time-invariant industry attributes such as seasonal volatility and median industry leverage. Finally, I include year fixed effects to control for macroeconomic shocks in capital availability.

Table 2, Panel A shows descriptive statistics for the full sample. The mean raw value of total government subsidies in my sample is $14.7 million. Megadeals make up the largest portion of total subsidies with an average of $6.8 million, due to the data collection and categorization of GJF. Indirect subsidies are the next largest subsidy group at $4.31 million, followed by direct

subsidies at $3.50 million. Bonds and loans make up the smallest group of subsidies with an average of $58,541.

Panel B shows the types of government subsidies by decile rank of subsidy/assets. On average, firms in the highest decile receive total government subsidies that are 1.0 percent of assets. Given a sample mean book leverage of 0.25, the highest decile subsidy of 0.01 equals about four percent of mean leverage. The highest decile firms receive *DIRECT (INDIRECT)* subsidies that are 0.31 (0.24) percent of assets. I also show average *AGE*, *ADVERTISING*, *BTM* and *BOOK LEV* by the decile rank of *TOTAL SUBSIDY*. These averages show that among my sample of firms receiving non-zero subsidies, government subsidies do not systematically favor firms that are more mature and established, have higher brand recognition, have higher growth potential, or have a particular level of leverage. Government agencies provide subsidies to all types of firms for reasons that span from investing in renewable energy to supporting a company with established ties to the community, which reduces concerns that government subsidies are endogenously related to firm capital structure. I acknowledge there may be unobservable, omitted variables that are correlated with government subsidy awards that also affect firm leverage. I try to address this concern by providing economic intuition that governments are unlikely to award subsidies based on unobservable measures related to leverage and by controlling for other known firm characteristics that influence capital structure decisions.

Table 3 displays Pearson and Spearman correlations among the variables used in my main analyses. Government subsidy types are generally positively correlated with each other, suggesting that firms are able to procure multiple types of subsidies and that a certain subsidy category is not given exclusively to one type of firm. I also find *TOTAL SUBSIDY* is negatively correlated with my measures of capital structure (*BOOK LEV*, *MARKET LEV*, and *INT-TO-*

EARN), providing preliminary evidence consistent with government subsidies being associated with firm capital structure. Leverage is generally positively associated with size and tangibility and negatively associated with growth and profitability, consistent with Frank and Goyal (2009).

Table 4 presents the results of estimating Equation (1). I present my five main dependent variables of interest, *BOOK LEV, NET BOOK LEV, MARKET LEV, NET MARKET LEV,* and *INT-TO-EARN* in columns 1, 2, 3, 4, and 5, respectively. My independent variable of interest is *TOTAL SUBSIDY*. Given the competing trade-off and pecking order theories, all tests are two-tail. In Column 1, the coefficient on *TOTAL SUBSIDY* of -0.032 (p-value < 0.01) indicates that, on average, firms in the top decile of government subsidy receipt have a *BOOK LEV* that is about three percentage points lower than firms in the lowest decile. In Column 2, *NET BOOK LEV* removes cash and marketable securities from the numerator of the dependent variable to account for the extra cash received from a government subsidy, and I find a significant and negative coefficient of -0.049 (p-value < 0.01). In Columns 3 and 4, I find the association is negative and significant for both measures of market leverage as well with coefficients of -0.025 (p-value < 0.05) and -0.027 (p-value < 0.05), respectively. I use *INT-TO-EARN* as an alternative measure to the debt ratios in Column 5. I find and the association remains negative and significant with a coefficient of -0.046 (p-value < 0.01). Overall, the consistent results across all four debt ratios and interest coverage suggests firms use government subsidies in their capital structure decisions. Additionally, the negative association is more consistent with the pecking order theory of capital structure than the trade-off theory providing evidence that adverse selection costs are significant enough to cause firms to substitute debt with government subsidies.

4.2 Government subsidy types and firm capital structure

Table 5 presents the estimated association between types of government subsidies and capital structure. I find *DIRECT SUBSIDY* is consistently and significantly negative at the one

percent level across all five measures of capital structure. The coefficient magnitudes on the debt ratios range from -0.027 (p-value < 0.01) on *NET MARKET LEV* to -0.038 (p-value < 0.01) on *NET BOOK LEV* indicating firms in the top decile have a leverage ratio that is 2.7 to 3.8 percentage points lower than firms in the lowest decile. This suggests firms use the funds from direct government subsidies as an alternative source of capital. *INDIRECT SUBSIDY* is only significant for one of the five measures of capital structure, *INT-TO-EARN*. It is negatively associated with a coefficient of -0.02 (p-value < 0.1). This may be due to firms that receive higher non-income tax relief have higher earnings, which is consistent with the findings of Drake et al. (2018). *BOND/LOAN SUBSIDY* is also only significant for the net measure of market leverage in Column4. As I am unable to separate public and private debt in firm financials, this is more likely due to the mechanical relationship between government loans and reported firm liabilities. With no statistically significant relationship with any other measure of leverage, this does not provide convincing evidence for the trade-off theory. *MEGADEAL SUBSIDY* is also only statistically associated with one of the five measures of capital structure (*NET BOOK LEV*), and because megadeals can be made up of all three types of subsidies, I am unable to determine which subsidy type is driving the association.

Analyzing the effect of each subsidy type is important as it informs the debate on the disclosure of government assistance, but it is also important empirically as it reduces concerns subsidies are endogenously related to capital structure. If governments awarded subsidies in a manner that methodically favored firms with lower measures of leverage, then I would have expected to find statistically significant results for all types of subsidies. This is true because all subsidy types are generally awarded with the same goal of improving the local economy. However, I find only *DIRECT SUBSIDY* is consistently associated with measures of capital

structure.[25] This result suggests that direct government subsidies affect capital structure decisions and it is not simply an artifact of the government subsidy award selection process.

Overall, these results suggest that corporations do view government subsidies as an alternative form of capital, but that the effect is larger for direct subsidies. Firms that receive direct government subsidies, such as federal or state grants, use the funds instead of issuing debt or equity. On the other hand, although firms benefit from government loans or indirect subsidies, they do not appear to affect their capital structure decisions. This evidence is consistent with the pecking order theory of capital structure. To fund corporate projects, firms first use internal funds and direct government subsidies, followed by debt and equity.

5. Additional analysis

5.1 Government subsidies and off-balance sheet financing

Governments provide subsidies with the objective of improving the local economy by creating new, high-paying jobs and encouraging local investment. To ensure a subsidy achieves these goals, some government agencies require firms to make investment commitments within the jurisdiction, and, if the commitments are not met, some or all of the subsidy must be repaid. The most common investment commitment is job count creation because it is relatively simple to verify and politicians commonly cite job count creation to support their economic policies.[26] Specific payroll levels and capital investment commitments are less common. If firms do use government subsidies to finance capital investment as shown above, and if governments consistently attach correlated investment commitments, then higher government commitments should help explain lower leverage ratios. Such a finding would indicate that government

[25] In untabulated tests, I examine each type of subsidy individually, excluding the other types, and the results are qualitatively similar.

[26] Examples of this include the Massachusetts governor announcing the creation of 1,100 jobs as part of a $20 million tax incentive and Utah governor's 25,000 job initiative in conjunction with the Governor's Office of Economic Development. https://www.mass.gov/news/baker-polito-administration-announces-job-creation-incentives-for-23-massachusetts-life | http://25kjobs.com/

subsidies are not free from obligation, but are used as a form of undisclosed, off-balance sheet financing. I test this by regressing *MARKET LEV* on the three types of off-balance sheet size-adjusted investment commitments: number of jobs committed (*JOBS*), payroll levels committed (*PAYROLL*), and capital investment committed *(CAPITAL*).

Table 6 presents my results of whether investment commitments appear to generate off-balance sheet financing. In Column 1, I find the number of jobs to which a firm commits creating is negatively associated with market leverage.[27] The coefficient of -0.011 (*p*-value < 0.01) indicates for every job committed, per million in assets, a firm's market leverage is lower by about one percentage point. This indicates firms do use government subsidies, with the associated investment commitments, as a form of off-balance sheet financing. Not all government agencies require firms to make investment commitments as is evidenced by the sample size decrease by over 40 percent in Column 1. This is consistent with the survey conducted by the ICMA in 2009 found that only 55 percent of US municipalities that offer incentives have mandatory performance qualifications for the companies receiving the incentives, and 28 percent performed no cost-benefit analysis at all (ICMA 2009). It is even less common to have a payroll level or capital investment commitment as can be seen by the further sample size decreases in Columns 2 and 3 where I do not find a significant association for either *PAYROLL* or *CAPITAL*. I cannot determine if the lack of significance is due to the decreased sample size, but the results are consistent with job count creation being the most common type of commitment required by the granting government.

[27] I use market leverage because Welch (2011b) argues book leverage does not appropriately account for non-financial liabilities, which includes commitments to governments. My results are qualitatively similar if I use book leverage.

5.2 Government subsidies and firm capital expenditures

I next examine how government subsidies affect corporate investment, because one factor that could explain the decrease in leverage I observe is acquiring additional assets without incremental debt financing. Ideally, I would test capital expenditure in the awarding jurisdiction to rule out the possibility the subsidy is being used in an alternative location as there is evidence state incentives are a zero-sum game (Goolsbee and Maydew 1998). Unfortunately, I am unable to view capital expenditures by location, so I use total capital expenditures as my proxy. I test the impact of government subsidies on firm capital spending using the following OLS regression:

$$CAPX_{i\,t+1} = \beta_0 + \beta_1 SUBSIDY_{it} + \gamma CONTROLS_{it} + \varepsilon_{it}, \quad (2)$$

where the outcome variable is capital expenditures in the next period deflated by book assets. My independent variables of interest are the measures of government subsidies used previously and I include the vector of controls from Equation 1 because the factors that affect how firms finance investments also explain corporate investment decisions (e.g. Almeida and Campello 2007).

Table 7 presents the capital expenditure results. In Column 1, I first estimate the impact of *TOTAL SUBSIDY* on capital expenditure in the next period. The coefficient on *TOTAL SUBSIDY* of 0.003 is positive and significant at the one percent level, consistent with government subsidies affecting future firm capital spending. The magnitude of the effect indicates capital expenditures increase by 0.3 percentage points from the bottom to the top decile of government subsidies. This represents about seven percent of a firm's average spending on capital.

In Column 2, I separate government subsidies into the four distinct categories. The coefficient on *DIRECT SUBSIDY* of 0.004 (*p*-value < 0.01) suggests direct government subsidies influence a firm's capital spending, and, on average, increases spending by about nine percent

going from the bottom to top deciles. No other category of government subsidy significantly explains capital investment.

In the last two columns of Table 7, I test the association as a changes model from time *t* to *t*+1 as a robustness test to reduce concerns of correlated omitted variables in the levels regression. The changes analysis accounts for time-invariant factors that impact a firm's capital spending. In Column 3, *TOTAL SUBSIDY* is positive and weakly significant with a slightly lower coefficient of 0.002 (*p*-value < 0.05), two-tailed. In Column 4, I separately include the four categories of government subsidies and find only *DIRECT SUBISDY* is significant in explaining changes in *CAPX*. The coefficient is meaningfully smaller in this model at 0.002, which might reflect a limited efficacy of government subsidies in changing a firm's overall investment strategy, but the results indicate corporations use direct government subsidies on increased capital expenditures. These results are consistent with firms use direct subsidies as an alternative funding source in their capital structure decisions.

5.3 Persistence of government subsidy receipts

I next examine the persistence of government subsidy receipts to determine whether subsidies continue as a material source of financing over time. Because subsidies are most material for firms in the top deciles, a finding that those firms can consistently receive large subsidies relative to their size, provides further evidence that firms are more likely to consider government subsidies in their capital structure decisions.

Table 8, Panel A shows the unconditional probability of a firm being in a particular subsidy quintile in the next period based in their current period quintile.[28] The diagonal can be thought of as a measure of persistence that a firm will remain in the same subsidy quintile in the

[28] I use subsidy quintiles for the persistence analysis for ease of table presentation. All results are qualitatively similar if performed using deciles.

next period. The results show that firms in a specific quintile in the current year are more likely to remain in the same quintile in the following year relative to other any other quintile. Firms in the highest quintile remain in the same quintile with a 57 percent likelihood—the highest degree of likelihood among all quintiles.

To provide a statistical test of the results in Panel A, I estimate a logistic regression with the dependent variable equal to one if the firm remains in the same subsidy quintile in the next period. The independent variables are indicators for each subsidy quintile. Table 3, Panel B presents the results. In Column 1, the coefficient on *Quintile 5* reflects the persistence of firms in the highest subsidy quintile relative to all other firms. I find a significantly positive coefficient indicating that firms in the highest quintile have more persistent subsidy reception relative firms in all other quintiles. In Column 2, I include an indicator variable for quintiles 1-4 and find firms in quintiles 2-4 have a statistically significant lower persistence than firms in the top quintile. This evidence supports the idea that firms, specifically those in the top deciles, can consistently receive a material portion of their financing from government subsidies.

The consistency with which firms are able to procure government subsidies through the years, provides support that levels regression is the appropriate test for this setting, consistent with the literature (e.g. Faulkender and Petersen 2006; Frank and Goyal 2009; and Faulkender and Smith 2016). Additional support is given by Lemmon et al. (2008) that find that firm fixed effects alone explain roughly 60% of cross-sectional variation in firm leverage and that they decrease the magnitude of other reliable predictors by 85%. They also find that debt ratios are "remarkably stable over time" with firms maintaining consistent leverage for over 20 years.

5.3 Government subsidies and the financial crisis

To address concerns the results are driven by the government providing emergency funding to financially distressed firms, I perform two additional analysis. First, I re-estimate Equation (1) and exclude the financial crisis years 2008-2010. Table 9 presents results and the findings are unchanged with firms in the top decile of *DIRECT SUBSIDY* having statistically lower measures of leverage. This reduces concerns that separate government programs such as the Trouble Asset Relief Program are driving the results. Second, I compute the KZ index (Kaplan and Zingales 1997) for each firm in my sample and find the average KZ index for each decile of subsidy reception is below -5.0, which indicates, on average, firms in my sample are not financially constrained. I conclude, it is unlikely the results are driven by firms seeking to obtain government funds when constrained individually or by macroeconomic conditions.

6. Sensitivity Tests

6.1 Continuous measures of subsidy/assets rather than deciles

I perform my main analyses with my variables of interest in decile rank for ease of interpreting coefficient magnitudes. In Table 10, I present the results of recreating Table 5 using the subsidies as a ratio instead of in decile rank. My results are robust. *DIRECT SUBSIDY* is negative and significant for four of the five measures of capital structure, with coefficients on the debt ratios ranging from -4.55 (p-value < 0. 05) to -9.72 (p-value < 0.05). This means a one standard deviation in direct government subsidies is associated with a 0.8 to 1.7 percentage point decrease in leverage. I do not find *INDIRECT SUBSIDY* or *MEGADEAL SUBSIDY* to be significant for any of the five measures of capital structure. Similar to Table 4, I again find *BOND/LOAN* subsidy to be significant for only one measure of capital structure, which is more likely due to the mechanical relationship between government loans and reported firm liabilities as I am unable to separate public and private debt in firm financials. Overall, the results are

consistent with my previous findings that direct government subsidies such as grants are used as an alternative source of external firm financing.

6. Conclusion

I study whether government subsidies affect a firm's capital structure. Capital structure is traditionally examined as a choice between debt and equity financing. However, current federal, state, and local government subsidies are estimated to be $170 billion, annually, which could affect firm capital structure. I use a novel database of historical government subsidies to perform my analysis, and I find that government subsidies are associated with firm capital structure. Specifically, firms in the top decile of government subsidies have debt ratios that are 2.7 to 4.9 percentage points lower than those in the lowest decile and that subsidy reception persists through time. This is consistent with the pecking order theory of capital structure with firms financing operation first with internal capital and government subsidies, followed by debt and equity. I find the association depends on the type of government subsidy received. Firms in the top decile of direct government subsidies like grants have debt ratios that are 2.7 to 3.8 percentage points lower than those in the lowest decile. I do not find a significant association with other types of government subsidies including non-income tax relief. I test whether the commitments firms make to governments to receive subsidies help explain their capital structure and find increased commitment to job creation is negatively associated with leverage. This indicates firms are able to use government subsidies as a source of off-balance sheet financing. Finally, I test whether government subsidies affect firm capital spending and find evidence consistent with direct subsidies increasing firm capital expenditures. Overall, these results suggest firms do use government subsidies in their capital structure decisions.

To my knowledge, I am the first to study the effects of government subsidies as an alternative source of corporate funding. My results highlight an important firm-specific characteristic that can be incorporated into existing capital structure models. My results are also important to standard setters as the FASB continues to debate disclosure standards around government assistance. Although, I cannot observe the processes by which various government agencies award the subsidies to corporations, I demonstrate that subsidies are given to firms in a manner that is not systematically related to observable firm characteristics that explain capital structure. I also highlight that my sample is restricted to only firms that do receive some form of government subsidy, and I control for characteristics that could potentially affect a government's preferences to award a subsidy to a particular type of firm. However, I acknowledge that I cannot completely rule out the possibility that governments award subsidies in a manner related to firm leverage given that the GJF data is collected from many different government agencies with distinctive selection procedures and objectives. Despite this limitation, my results indicate firms consider a range of funding sources in their capital structure decisions, including debt, equity, and government subsidies.

Appendix A: Good Jobs First Subsidy Classifications

A detailed table of the government awards included in the GJF data and the subsidy classification is included below.

Type of Subsidy	Subsidy Classification
Bond	Bond or Loan
Cost reimbursement	Direct Subsidy Payment
Enterprise zone	Indirect Subsidy Payment
Federal allocated tax credit	Direct Subsidy Payment
Federal grant	Direct Subsidy Payment
Federal insurance	Direct Subsidy Payment
Federal loan or loan guarantee	Bond or Loan
Federal tax-exempt bond	Bond or Loan
Grant	Direct Subsidy Payment
Grant/loan hybrid program	Bond or Loan
Industrial revenue bond	Bond or Loan
Infrastructure assistance	Direct Subsidy Payment
Loan	Bond or Loan
Loan or bond financing	Bond or Loan
Megadeal	Megadeal
Property tax abatement	Indirect Subsidy Payment
Tax credit/rebate	Indirect Subsidy Payment
Tax credit/rebate and grant	Indirect Subsidy Payment
Tax credit/rebate; property tax abatement	Indirect Subsidy Payment
Tax increment financing	Indirect Subsidy Payment
Training reimbursement	Direct Subsidy Payment
Venture capital	Direct Subsidy Payment

I classify non-income tax relief, following Drake et al. (2018), as indirect subsidy. I classify direct subsidy payments as programs that remunerate corporations directly or are part of a federal subsidy program. I include all programs that provide bond or loan financing in the bond or loan categories. Hybrid programs are classified based on the majority of the transactions in the underlying data. Megadeals are multifaceted government awards with a total state and local cost of $75 million or more. The deals are often a combination of many different types of government subsidies. Due to the magnitude of megadeals as well as the difficulty in effectively separating the types of government subsidies contained within each megadeal, I include a separate category for megadeals.

Appendix B: Variable Definitions

Variable	Definition	Source
ADVERTIZING	Advertising expense deflated by sales. (XAD / SALE)	Compustat
AGE	Firm age computed from the corporation's earliest appearance in the Compustat database	Compustat
BOND/LOAN SUBSIDY	Total government bonds and loans (defined in Appendix B) summed at parent entity deflated by total assets. I multiply assets by 1,000,000 for expositional interpretation.	Good Jobs First Compustat
BOOK LEV	Sum of short-term and long-term debt divided by book assets ((DLC + DLTT) / AT)	Compustat
BTM	Common shareholders' equity over market value of equity. (CEQ / MVE)	Compustat
CAPITAL	The investment to which a firm commits making to receive a government subsidy scaled by assets. I multiply assets by 1,000,000 for expositional interpretation.	Good Jobs First Compustat
CAPX	Capital expenditures deflated by assets	Compustat
DEPRECIATION	Depreciation deflated by assets. (DP / AT)	Compustat
DIRECT SUBSIDY	Total indirect taxes (defined in Appendix B) summed at parent entity deflated by total assets. I multiply assets by 1,000,000 for expositional interpretation.	Good Jobs First Compustat
INDIRECT SUBSIDY	Total government indirect tax relief (defined in Appendix B) summed at parent entity deflated by total assets. I multiply assets by 1,000,000 for expositional interpretation.	Good Jobs First Compustat
INSTITUTIONAL OWNERSHIP	Shares held by institutional investors scaled by total shares outstanding	I/B/E/S CRSP
INT-TO-EARN	Interest-to-earnings. Natural log of one plus interest expense divided by earnings before interest and taxes Ln(1 + (XINT / EBIT))	Compustat
JOBS	The number of jobs to which a firm commits creating to receive a government subsidy scaled by assets.	Good Jobs First Compustat
MARKET LEV	Sum of short-term and long-term debt divided by the value of debt plus market value of equity. ((DLC + DLTT) / (DLC + DLTT + MVE)	Compustat

MEGADEAL SUBSIDY	Total government megadeals (defined in Appendix B) summed at parent entity deflated by total assets. I multiply assets by 1,000 for expositional interpretation.	Good Jobs First Compustat
MTR	Simulated pre-financing marginal tax rate from Graham (1996b)	John Graham's website
MVE	Natural log of market value of equity measured as of fiscal year end date. Ln(PRCC_F × CSHO)	Compustat
NET BOOK LEV	Sum of short-term and long-term debt less cash and marketable securities divided by book assets ((DLC + DLTT - CHE) / AT)	Compustat
NET MARKET LEV	Sum of short-term and long-term debt less cash and marketable securities divided by the value of debt plus market value of equity. ((DLC + DLTT - CHE) / (DLC + DLTT + MVE)	Compustat
PAYROLL	The wages to which a firm commits paying to receive a government subsidy scaled by assets. I multiply assets by 1,000,000 for expositional interpretation.	Good Jobs First Compustat
PPE	Net property, plant, and equipment deflated by book assets. (PPENT / AT)	Compustat
R&D	Research and development deflated by assets. (XRD / AT)	Compustat
ROA	Earnings before interest and taxes deflated by book assets. (EBIT / AT)	Compustat
SALES	Natural log of sales in millions. Ln(SALE)	Compustat
TOTAL SUBSIDY	Total government subsidies summed at parent entity deflated by total assets. I multiply assets by 1,000,000 for expositional interpretation.	Good Jobs First Compustat

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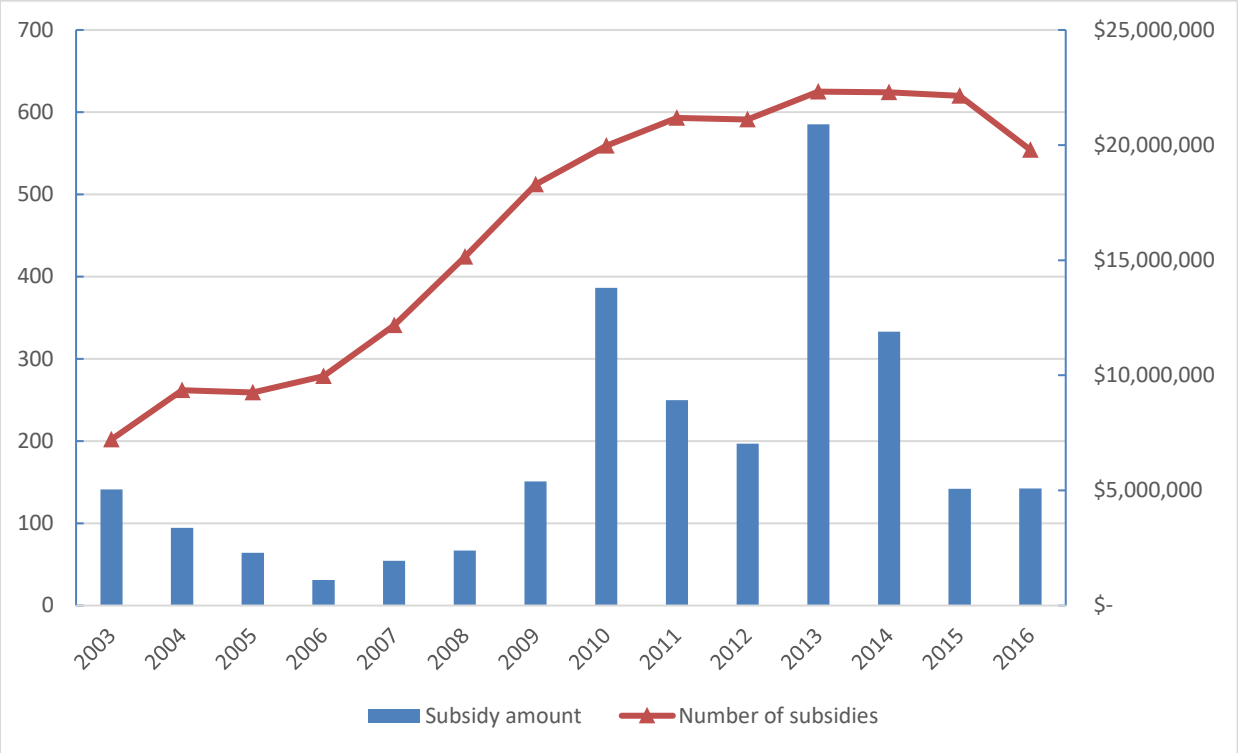
Figure 1

Government subsidies by year



My sample period covers the years 2003-2016 because GJF indicates the data become more complete after 2002. Subsidy amount is the total of all subsidy types in thousands of nominal dollars.

Table 1

Sample selection

Total affiliate-years in Good Jobs First Subsidy Tracker with parent information	98,886
Less: Missing stock ticker	(28,878)
Affiliate-years from Good Jobs First Subsidy Tracker	70,008
Total parent firm-years linked to Compustat	9,409
Less: Missing marginal tax rate	(2,185)
Less: Missing capital structure measures	(529)
Less: Missing property, plant, and equipment	(128)
Less: Missing institutional ownership	(54)
Less: Missing other control variables	(34)
Firm-years used for estimation	6,479

Source: Good Jobs First Subsidy Tracker and Compustat. My sample consists of 6,479 firm-year observations from public firms receiving at least one type of government subsidy in the United States between 2003 and 2016.

Table 2

Panel A: Descriptive statistics

	Mean	St. dev.	P25	Median	P75
BOOK LEV	0.249	0.175	0.119	0.235	0.353
MARKET LEV	0.222	0.185	0.084	0.181	0.320
TOTAL SUBSIDY (thousands $)	14700.000	158000.000	87.555	500.000	2813.514
DIRECT SUBSIDY (thousands $)	3502.008	28100.000	0.000	8.500	445.000
INDIRECT SUBSIDY (thousands $)	4314.525	44500.000	2.257	127.270	1057.317
BOND/LOAN SUBSIDY (thousands $)	58.541	774.538	0.000	0.000	0.000
MEGADEAL SUBSIDY (thousands $)	6810.683	140000.000	0.000	0.000	0.000
MTR	0.288	0.120	0.317	0.350	0.350
BTM	0.459	0.334	0.241	0.397	0.612
SALES	8.189	1.693	7.140	8.194	9.326
PPE	0.267	0.213	0.100	0.205	0.385
ROA	0.094	0.086	0.056	0.091	0.134
R&D	0.026	0.051	0.000	0.003	0.029
DEPRECIATION	0.038	0.022	0.024	0.034	0.048
ADVERTIZING	0.010	0.023	0.000	0.000	0.008
AGE	33.059	19.385	16.000	28.000	52.000
INSTITUTIONAL OWNERSHIP	0.710	0.195	0.618	0.736	0.840
CAPX	0.044	0.039	0.019	0.034	0.058
INT-TO-EARN	0.150	0.189	0.041	0.103	0.214
N	6,479				

Variable definitions and sources are included in Appendix B. My sample consists of 6,479 firm-year observations from 2003-2016 receiving at least one type of government subsidy in the United States and sufficient data from GJF and Compustat for estimation.

Panel B: Decile rank

DECILE	*TOTAL SUBSIDY*	*DIRECT SUBSIDY*	*INDIRECT SUBSIDY*	*BOND/LOAN SUBSIDY*	*MEGADEAL SUBSIDY*	*AGE*	*ADVERTIZING*	*BTM*	*BOOK LEV*
(lowest)									
Decile 1	0.000	0.000	0.000	0.000	0.000	31.593	0.009	0.536	0.248
Decile 2	0.001	0.000	0.001	0.000	0.000	34.235	0.010	0.459	0.269
Decile 3	0.003	0.001	0.002	0.000	0.000	34.208	0.012	0.450	0.271
Decile 4	0.005	0.002	0.003	0.000	0.000	34.898	0.012	0.469	0.256
Decile 5	0.009	0.003	0.006	0.000	0.000	35.045	0.011	0.451	0.253
Decile 6	0.016	0.006	0.010	0.000	0.000	32.064	0.013	0.460	0.251
Decile 7	0.030	0.012	0.017	0.000	0.000	35.895	0.011	0.447	0.236
Decile 8	0.057	0.022	0.033	0.001	0.000	34.753	0.009	0.448	0.239
Decile 9	0.138	0.053	0.080	0.003	0.002	31.542	0.008	0.419	0.245
Decile 10 (highest)	1.016	0.313	0.235	0.033	0.453	26.352	0.007	0.448	0.221
Total	0.127	0.041	0.039	0.004	0.045	33.059	0.010	0.459	0.249

Decile rank of government subsides. Subsidies are presented as a percentage of firm book assets (e.g. *TOTAL SUBSIDY* of 0.50 indicates total subsidies represent 0.5 percent of a firm's assets). The means of other firm characteristics are presented by the decile rank of *TOTAL SUBSIDY*.

Table 3

Correlation table

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 *BOOK LEV*		0.74	-0.06	-0.07	-0.02	0.01	0.03	-0.06	-0.16	0.15	0.23	-0.03	-0.20	0.09	0.02	0.05	-0.05	0.06	0.50
2 *MARKET LEV*	0.79		-0.06	-0.05	-0.03	0.00	0.02	-0.06	0.33	0.21	0.28	-0.27	-0.31	0.05	-0.12	0.08	-0.03	0.05	0.62
3 *TOTAL SUBSIDY*	-0.08	-0.12		0.66	0.43	0.18	0.27	-0.05	-0.04	-0.23	0.02	-0.19	0.19	0.03	-0.02	-0.10	-0.14	0.05	-0.06
4 *DIRECT SUBSIDY*	-0.06	-0.02	0.39		-0.02	0.06	0.03	-0.07	-0.01	-0.26	0.01	-0.25	0.22	0.01	-0.07	-0.07	-0.15	0.03	-0.06
5 *INDIRECT SUBSIDY*	0.03	-0.03	0.50	-0.34		0.00	0.08	-0.01	-0.01	-0.16	0.05	-0.02	0.04	0.03	0.00	-0.12	-0.07	0.06	-0.02
6 *BOND/LOAN SUBSIDY*	0.02	0.03	0.11	0.02	0.02		0.00	-0.02	-0.01	-0.06	-0.02	-0.06	0.07	-0.03	-0.01	-0.02	-0.03	-0.01	0.00
7 *MEGADEAL SUBSIDY*	0.00	0.02	0.17	0.03	0.03	0.01		0.00	-0.04	0.00	0.03	0.00	0.01	0.01	0.00	-0.02	-0.01	0.01	0.02
8 *MTR*	-0.03	0.02	-0.02	0.01	0.01	0.02	0.03		-0.04	0.15	0.09	0.23	-0.15	-0.01	0.02	0.09	-0.01	0.06	-0.04
9 *BTM*	-0.12	0.33	-0.05	0.02	-0.06	-0.02	-0.04	0.06		-0.03	0.14	-0.31	-0.22	0.00	-0.14	-0.05	0.02	0.03	0.16
10 *SALES*	0.18	0.24	-0.21	0.03	0.00	0.05	0.12	0.12	-0.05		0.10	0.26	-0.35	-0.08	0.09	0.43	0.03	0.01	0.10
11 *PPE*	0.25	0.26	0.09	0.06	0.05	-0.05	0.02	0.16	0.13	0.09		-0.01	-0.28	0.51	-0.10	0.11	-0.07	0.70	0.23
12 *ROA*	-0.09	-0.40	0.01	-0.05	0.10	0.00	-0.01	0.09	-0.48	0.13	0.00		-0.31	0.02	0.13	0.10	0.10	0.07	-0.14
13 *R&D*	-0.20	-0.35	0.15	0.10	0.04	0.01	0.02	-0.18	-0.28	-0.21	-0.31	0.06		-0.02	0.02	-0.16	-0.04	-0.11	-0.22
14 *DEPRECIATION*	0.08	0.03	0.07	0.01	0.05	-0.05	0.00	0.07	-0.01	-0.09	0.60	0.05	0.00		0.02	-0.05	0.02	0.56	0.10
15 *ADVERTIZING*	-0.03	-0.16	-0.05	-0.09	0.05	-0.01	0.02	-0.02	-0.20	0.09	-0.06	0.18	0.05	0.08		0.03	-0.04	-0.03	-0.09
16 *AGE*	0.09	0.11	-0.08	0.10	-0.02	0.02	0.04	0.11	-0.02	0.44	0.14	0.08	0.04	-0.01	0.01		-0.12	-0.01	0.02
17 *INSTITUTIONAL OWNERSHIP*	-0.05	-0.01	-0.07	-0.04	-0.02	-0.01	-0.05	-0.03	0.06	-0.08	-0.08	0.04	0.03	0.02	-0.03	-0.17		0.00	0.01
18 *CAPX*	0.09	0.03	0.13	0.06	0.06	-0.03	0.02	0.13	-0.03	0.04	0.79	0.14	-0.16	0.60	0.03	0.05	-0.03		0.04
19 *INT-TO-EARN*	0.66	0.79	-0.13	-0.04	-0.04	0.02	0.02	0.07	0.25	0.18	0.27	-0.38	-0.28	0.08	-0.13	0.10	0.04	0.06	

This table presents correlations for all variables used in the main regression analysis. My sample consists of 6,479 firm-year observations from 2003-2016 receiving at least one type of government subsidy in the United States. The subsidy measures in this table are the scaled values of the subsidy rather than the decile ranking included in the regression analysis. Pearson (Spearman) correlations are presented above (below) the diagonal.

Table 4

The association between total government subsidies and firm capital structure

	(1) BOOK LEV_t	(2) NET BOOK LEV_t	(3) MARKET LEV_t	(4) NET MARKET LEV_t	(5) INT-TO-$EARN_t$
TOTAL SUBSIDY	-0.032***	-0.049***	-0.025**	-0.027**	-0.046***
	(-3.531)	(-3.858)	(-2.602)	(-2.503)	(-4.966)
MTR	-0.088***	-0.011	-0.124***	-0.054	-0.095***
	(-3.257)	(-0.255)	(-4.450)	(-1.424)	(-3.760)
BTM	-0.156***	-0.124***	0.065**	-0.012	0.009
	(-5.186)	(-3.442)	(2.542)	(-0.395)	(0.463)
SALES	0.019***	0.028***	0.027***	0.024***	0.015***
	(5.335)	(5.561)	(7.412)	(5.989)	(4.215)
PPE	0.068	0.139**	0.082*	0.165***	0.070
	(1.681)	(2.721)	(2.106)	(4.041)	(1.415)
ROA	-0.420***	-0.433***	-0.643***	-0.488***	-0.418***
	(-7.293)	(-5.221)	(-11.636)	(-7.490)	(-5.964)
R&D	-0.942***	-2.361***	-0.971***	-1.324***	-0.829***
	(-8.605)	(-11.966)	(-9.919)	(-11.230)	(-7.965)
DEPRECIATION	0.591*	1.477***	0.531*	0.729**	0.858**
	(2.076)	(4.087)	(1.853)	(2.453)	(2.544)
ADVERTIZING	0.037	-0.300	-0.448**	-0.511**	-0.376*
	(0.159)	(-0.944)	(-2.446)	(-2.396)	(-2.147)
AGE	-0.001***	-0.001	-0.001**	-0.001*	-0.001***
	(-3.978)	(-1.619)	(-2.205)	(-1.868)	(-3.131)
INSTITUTIONAL OWNERSHIP	-0.010	-0.037	-0.009	-0.018	0.017
	(-0.470)	(-1.169)	(-0.349)	(-0.628)	(0.699)
Observations	6,479	6,479	6,479	6,479	6,479
R-squared	0.350	0.466	0.467	0.443	0.213
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

This table presents the results of OLS estimates of Equation (1), which tests the association between firm capital structure and total government subsidies. My sample consists of 6,479 firm-year observations from 2003-2016 receiving at least one type of government subsidy in the United States. See Appendix B for all variable definitions and sources. All continuous variables are winsorized at the 1% and 99% levels. Standard errors are clustered at the firm and year level. *, **, and *** indicate statistical significance at the two-tailed 10%, 5%, and 1% level.

Table 5

The association between types of government subsidies and firm capital structure

	(1) BOOK LEV_t	(2) NET BOOK LEV_t	(3) MARKET LEV_t	(4) NET MARKET LEV_t	(5) INT-TO-$EARN_t$
DIRECT SUBSIDY	-0.029***	-0.038***	-0.031***	-0.027***	-0.040***
	(-3.924)	(-3.309)	(-4.129)	(-3.097)	(-4.862)
INDIRECT SUBSIDY	-0.005	0.004	-0.013	-0.001	-0.019*
	(-0.579)	(0.280)	(-1.388)	(-0.079)	(-2.012)
BOND/LOAN SUBSIDY	0.018	0.025	0.018	0.029**	0.010
	(1.336)	(1.684)	(1.400)	(2.161)	(0.687)
MEGADEAL SUBSIDY	-0.025	-0.047*	0.004	-0.020	0.014
	(-1.127)	(-1.866)	(0.163)	(-0.734)	(0.544)
MTR	-0.088***	-0.010	-0.125***	-0.054	-0.094***
	(-3.263)	(-0.250)	(-4.453)	(-1.428)	(-3.705)
BTM	-0.155***	-0.123***	0.066**	-0.011	0.010
	(-5.244)	(-3.480)	(2.579)	(-0.384)	(0.508)
SALES	0.021***	0.031***	0.028***	0.026***	0.017***
	(5.988)	(6.179)	(7.992)	(6.510)	(5.075)
PPE	0.064	0.131**	0.079*	0.161***	0.063
	(1.583)	(2.578)	(2.053)	(3.931)	(1.290)
ROA	-0.429***	-0.448***	-0.651***	-0.498***	-0.428***
	(-7.477)	(-5.451)	(-11.790)	(-7.630)	(-6.116)
R&D	-0.957***	-2.384***	-0.985***	-1.338***	-0.852***
	(-8.780)	(-12.240)	(-10.098)	(-11.442)	(-8.109)
DEPRECIATION	0.621**	1.526***	0.554*	0.758**	0.893**
	(2.175)	(4.258)	(1.925)	(2.554)	(2.616)
ADVERTIZING	0.034	-0.303	-0.454**	-0.513**	-0.387**
	(0.144)	(-0.948)	(-2.446)	(-2.396)	(-2.197)
AGE	-0.001***	-0.001	-0.001*	-0.001	-0.001**
	(-3.839)	(-1.479)	(-2.058)	(-1.746)	(-2.937)
INSTITUTIONAL OWNERSHIP	-0.009	-0.035	-0.008	-0.017	0.020
	(-0.433)	(-1.118)	(-0.338)	(-0.614)	(0.811)
Observations	6,479	6,479	6,479	6,479	6,479
R-squared	0.351	0.466	0.469	0.444	0.214
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

This table presents the results of OLS estimates of Equation (1), which tests the association between firm capital structure and government subsidy types. My sample consists of 6,479 firm-year observations from 2003-2016 receiving at least one type of government subsidy in the United States. See Appendix B for all variable definitions and sources. All continuous variables are winsorized at the 1% and 99% levels. Standard errors are clustered at the firm and year level. *, **, and *** indicate statistical significance at the two-tailed 10%, 5%, and 1% level.

Table 6

Government subsidies as off-balance sheet liabilities

	(1) MARKET LEV_t	(2) MARKET LEV_t	(3) MARKET LEV_t
JOBS	*-0.011***		
	(-2.581)		
WAGE		-0.124	
		(-1.225)	
CAPITAL			0.002
			(0.092)
MTR	-0.147***	-0.147***	-0.164***
	(-6.200)	(-4.043)	(-5.860)
BTM	0.075***	0.046***	0.093***
	(8.500)	(3.334)	(8.867)
SALES	0.024***	0.024***	0.025***
	(12.053)	(8.204)	(11.440)
PPE	0.094***	0.069**	0.070***
	(4.314)	(2.183)	(2.881)
ROA	-0.714***	-0.746***	-0.709***
	(-18.093)	(-11.844)	(-15.105)
R&D	-0.898***	-0.786***	-0.783***
	(-11.512)	(-6.513)	(-8.584)
DEPRECIATION	0.364**	0.389	0.571***
	(2.144)	(1.491)	(2.874)
ADVERTIZING	-0.246**	-0.195	-0.442***
	(-2.027)	(-1.089)	(-3.241)
AGE	-0.000***	-0.001***	-0.000***
	(-2.776)	(-2.678)	(-2.639)
INSTITUTIONAL OWNERSHIP	-0.020	0.034	-0.024
	(-1.462)	(1.553)	(-1.459)
Observations	3,569	1,635	2,676
R-squared	0.456	0.445	0.475
Industry dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes

This table presents the results of OLS estimates of regressing market leverage on investment commitments to the government. My sample consists of 6,479 firm-year observations from 2003-2016 receiving at least one type of government subsidy in the United States and with data on investment commitments to the government. See Appendix B for all variable definitions and sources. All continuous variables are winsorized at the 1% and 99% levels. *, **, and *** indicate statistical significance at the two-tailed 10%, 5%, and 1% level

Table 7

Estimation of the effect of total government subsidies on firm investment

	Levels model		*Changes model*	
	(1)	(2)	(3)	(4)
	$CAPX_{t+1}$	$CAPX_{t+1}$	CAPX	CAPX
TOTAL SUBSIDY	0.003**		0.002**	
	(2.302)		(2.802)	
DIRECT SUBSIDY		0.004**		0.002*
		(2.891)		(1.878)
INDIRECT SUBSIDY		-0.003		0.000
		(-1.759)		(0.520)
BOND/LOAN SUBSIDY		0.005		-0.001
		(1.587)		(-0.497)
MEGADEAL SUBSIDY		0.005		-0.002
		(1.266)		(-0.848)
MTR	-0.012**	-0.012**	0.001	0.001
	(-2.388)	(-2.369)	(0.495)	(0.506)
BTM	-0.008***	-0.008***	0.000	0.000
	(-4.376)	(-4.411)	(0.029)	(0.041)
SALES	-0.001**	-0.001**	0.001	0.001
	(-2.350)	(-2.934)	(0.470)	(0.461)
PPE	0.111***	0.112***	0.216***	0.215***
	(12.435)	(12.591)	(8.496)	(8.375)
ROA	0.047***	0.049***	0.047**	0.047**
	(6.036)	(6.363)	(2.931)	(2.928)
R&D	0.047**	0.049***	0.142**	0.144**
	(2.983)	(3.140)	(2.483)	(2.510)
DEPRECIATION	0.348***	0.344***	-0.150	-0.148
	(4.896)	(4.839)	(-1.399)	(-1.394)
ADVERTIZING	0.055	0.056*	0.095	0.095
	(1.718)	(1.829)	(1.587)	(1.595)
AGE	-0.000	-0.000	-0.000	-0.000
	(-0.935)	(-1.063)	(-0.166)	(-0.173)
INSTITUTIONAL	0.007*	0.007*	0.005	0.005
OWNERSHIP	(1.873)	(1.884)	(1.225)	(1.271)
Observations	6,185	6,185	4,322	4,322
R-squared	0.584	0.586	0.205	0.206
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes

This table presents the results of OLS estimates of Equation (2), which tests the association between firm capital investment and total government subsidies and government subsidy types. The first two columns present the results of the levels regression. The last two columns present the results of a changes model estimation with all applicable

dependent and independent variables calculated as changes from time t to time t+1. My sample consists of 6,479 firm-year observations from 2003-2016 receiving at least one type of government subsidy in the United States and with data on capital expenditures in the next year. See Appendix B for all variable definitions and sources. All continuous variables are winsorized at the 1% and 99% levels. Standard errors are clustered at the firm and year level. *, **, and *** indicate statistical significance at the two-tailed 10%, 5%, and 1% level

Table 8

Persistence of Government Subsidies

Panel A: Unconditional probability of remaining in the same subsidy quintile

	Current Subsidy Quintiles				
Future Year Quintiles	*1st Quintile (lowest)*	*2nd Quintile*	*3rd Quintile*	*4th Quintile*	*5th Quintile (highest)*
(lowest)					
Quintile 1	**55%**	21%	10%	8%	4%
Quintile 2	21%	**40%**	22%	11%	6%
Quintile 3	10%	21%	**38%**	20%	11%
Quintile 4	9%	11%	21%	**42%**	21%
Quintile 5 (highest)	5%	7%	8%	18%	**57%**
Total	100%	100%	100%	100%	100%

Panel B: Persistence logistic regression

	(1) TOTAL SUBSIDY	(2) TOTAL SUBSIDY
Quintile 5 (highest)	0.267***	
	(3.230)	
Quintile 4		-0.329***
		(-3.275)
Quintile 3		-0.409***
		(-3.943)
Quintile 2		-0.294***
		(-2.820)
Quintile 1 (lowest)		0.024
		(0.221)
Constant	-1.564	-1.306
	(-1.539)	(-1.284)
Observations	5,912	5,912
Industry dummies	Yes	Yes
Year dummies	Yes	Yes

Panel A presents the unconditional probability that, given its current year subsidy quintile, a firm will be in a specific quintile in the next period. Panel B present the results of a logit regression with the dependent variable equal to 1 if the firm remains in the same subsidy quintile from year t to t+1. The independent variables are set equal to 1 to indicate the current year subsidy quintile of a firm. My sample consists of 6,479 firm-year observations from 2003-2016 receiving at least one type of government subsidy in the United States *, **, and *** indicate statistical significance at the two-tailed 10%, 5%, and 1% level

Table 9

The association between types of government subsidies and firm capital structure excluding the financial crisis years 2008-2010

	(1) BOOK LEV_t	(2) NET BOOK LEV_t	(3) MARKET LEV_t	(4) NET MARKET LEV_t	(5) INT-TO-$EARN_t$
DIRECT SUBSIDY	-0.027***	-0.036**	-0.030***	-0.027**	-0.037***
	(-3.465)	(-2.916)	(-3.629)	(-2.834)	(-3.883)
INDIRECT SUBSIDY	-0.006	0.001	-0.015	-0.003	-0.021*
	(-0.566)	(0.077)	(-1.556)	(-0.264)	(-2.052)
BOND/LOAN SUBSIDY	0.025	0.028	0.024	0.025	0.008
	(1.687)	(1.688)	(1.752)	(1.780)	(0.559)
MEGADEAL SUBSIDY	-0.046***	-0.066***	-0.022	-0.047**	-0.007
	(-3.996)	(-3.800)	(-1.461)	(-2.441)	(-0.418)
MTR	-0.068**	0.025	-0.098***	-0.012	-0.074**
	(-2.534)	(0.572)	(-3.709)	(-0.328)	(-2.845)
BTM	-0.188***	-0.160***	0.050**	-0.029	0.016
	(-8.395)	(-5.459)	(2.525)	(-1.233)	(0.901)
SALES	0.019***	0.028***	0.027***	0.024***	0.016***
	(5.540)	(5.760)	(7.673)	(6.262)	(4.473)
PPE	0.060	0.125**	0.077*	0.158***	0.050
	(1.467)	(2.487)	(2.013)	(3.852)	(1.007)
ROA	-0.475***	-0.500***	-0.686***	-0.553***	-0.407***
	(-8.349)	(-5.929)	(-12.286)	(-8.691)	(-5.022)
R&D	-1.016***	-2.519***	-1.014***	-1.371***	-0.801***
	(-9.135)	(-12.860)	(-9.895)	(-11.961)	(-6.741)
DEPRECIATION	0.712**	1.683***	0.672**	0.865**	1.028**
	(2.500)	(4.810)	(2.404)	(2.981)	(2.904)
ADVERTIZING	0.024	-0.300	-0.435**	-0.509**	-0.431**
	(0.103)	(-0.958)	(-2.313)	(-2.346)	(-2.353)
AGE	-0.001***	-0.001	-0.001**	-0.001*	-0.001**
	(-3.926)	(-1.714)	(-2.323)	(-2.095)	(-2.725)
INSTITUTIONAL OWNERSHIP	0.006	-0.013	0.015	0.007	0.042
	(0.277)	(-0.419)	(0.746)	(0.273)	(1.765)
Observations	4,975	4,975	4,975	4,975	4,975
R-squared	0.363	0.477	0.471	0.451	0.215
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

This table presents the results of OLS estimates of Equation (1), which tests the association between firm capital structure and government subsidy types, but excludes the financial crisis years 2008-2010. My sample consists of 6,479 firm-year observations from 2003-2016 receiving at least one type of government subsidy in the United States. See Appendix B for all variable definitions and sources. All continuous variables are winsorized at the 1%

and 99% levels. Standard errors are clustered at the firm and year level. *, **, and *** indicate statistical significance at the two-tailed 10%, 5%, and 1% level

Table 10

The association between types of government subsidies as ratios and firm capital structure

	(1) BOOK LEV_t	(2) NET BOOK LEV_t	(3) MARKET LEV_t	(4) NET MARKET LEV_t	(5) INT-TO-$EARN_t$
DIRECT SUBSIDY	-4.546**	-9.723**	-3.954	-5.253*	-7.641**
	(-2.227)	(-2.816)	(-1.748)	(-2.054)	(-2.892)
INDIRECT SUBSIDY	-1.843	-3.363	-0.717	-1.106	-2.575
	(-0.506)	(-0.704)	(-0.193)	(-0.287)	(-0.968)
BOND/LOAN SUBSIDY	4.629	4.125	2.692*	1.947	2.211
	(1.333)	(0.779)	(2.154)	(0.854)	(0.486)
MEGADEAL SUBSIDY	0.328	0.334	0.398	0.338	0.331
	(0.991)	(0.858)	(0.940)	(0.936)	(0.543)
MTR	-0.086***	-0.011	-0.123***	-0.053	-0.095**
	(-3.240)	(-0.264)	(-4.462)	(-1.433)	(-2.321)
BTM	-0.155***	-0.124***	0.066**	-0.012	0.009
	(-5.185)	(-3.497)	(2.612)	(-0.396)	(0.333)
SALES	0.019***	0.027***	0.027***	0.024***	0.015***
	(5.298)	(5.425)	(7.432)	(5.871)	(3.694)
PPE	0.061	0.131**	0.075*	0.159***	0.061
	(1.538)	(2.616)	(2.000)	(3.958)	(1.257)
ROA	-0.433***	-0.463***	-0.655***	-0.505***	-0.442***
	(-7.270)	(-5.555)	(-11.390)	(-7.540)	(-6.042)
R&D	-0.946***	-2.357***	-0.972***	-1.322***	-0.827***
	(-8.423)	(-11.801)	(-9.787)	(-11.208)	(-7.952)
DEPRECIATION	0.618**	1.508***	0.555*	0.750**	0.886**
	(2.182)	(4.215)	(1.950)	(2.544)	(2.655)
ADVERTIZING	0.031	-0.310	-0.454**	-0.517**	-0.385**
	(0.135)	(-0.973)	(-2.458)	(-2.424)	(-2.190)
AGE	-0.001***	-0.001	-0.001**	-0.001*	-0.001***
	(-3.952)	(-1.609)	(-2.172)	(-1.844)	(-3.034)
INSTITUTIONAL OWNERSHIP	-0.011	-0.042	-0.009	-0.020	0.014
	(-0.519)	(-1.357)	(-0.391)	(-0.726)	(0.571)
Observations	6,479	6,479	6,479	6,479	6,479
R-squared	0.350	0.467	0.467	0.443	0.213
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

This table presents the results of OLS estimates of Equation (1), which tests the association between firm capital structure and government subsidy types. The variables *DIRECT SUBSIDY, INDIRECT SUBSIDY, BOND/LOAN SUBSIDY,* and *MEGADEAL SUBSIDY* are presented as ratios instead of decile rank. My sample consists of 6,479 firm-year observations from 2003-2016 receiving at least one type of government subsidy in the United States. See Appendix B for all variable definitions and sources. All continuous variables are winsorized at the 1% and 99%

levels. Standard errors are clustered at the firm and year level. *, **, and *** indicate statistical significance at the two-tailed 10%, 5%, and 1% level.

Summary statistics for Table 10

	Mean	St. Dev
DIRECT SUBSIDY	0.000411	0.001737
INDIRECT SUBSIDY	0.000386	0.001127
BOND/LOAN SUBSIDY	0.000037	0.001055
MEGADEAL SUBSIDY	0.000454	0.011134

Summary statistics are provided for interpreting coefficient magnitudes in Table 10. These data are presented in raw dollars in Table 2.