Does Complex Regulation Create Insider Trading Opportunities?

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ABSTRACT

Over the past two decades, policymakers have increasingly passed broad-reaching and complex regulation. Using the 2017 Tax Cuts and Jobs Act (TCJA) as a setting of such regulation, we find that this complex set of changes to U.S. tax law is associated with increased market uncertainty, information asymmetry, and insider trade profitability. These findings are consistent with insiders' differential abilities to process information about the new regulation. Insider profits are concentrated in firms where analysts struggle to predict the effect of the TCJA and among insiders with greater *ex-ante* ability to understand tax law. External constraints are associated with lower insider trade profitability, and we also find evidence that insider profits are associated with specific provisions of the TCJA. Overall, our evidence suggests that complex regulation can create uncertainty that firm insiders exploit for their own gain and that the legislative process can inadvertently reward firm insiders.

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I. INTRODUCTION

The complexity and scope of U.S. regulations have increased dramatically in recent decades, and the costs to firms are significant (e.g., Davis 2017). Prior research finds that regulation is associated with higher labor costs, slower sales growth, lower profitability, and higher risk (Calomiris, Mamaysky, and Yang 2022; Trebbi, Zhang, and Simkovic 2023; Kalmenovitz 2023). Yet, the burdens of regulation extend beyond the regulated firms. Regulation can increase information asymmetry between internal and external stakeholders, given differences in their ability to quickly understand the net effect of new regulation on firm value. Because insiders control firm decisions, possess private information about firm operations, and have incentives to focus on their firm specifically, insiders may predict the firm-specific effects of complex regulations more readily or accurately than the rest of the market. If so, complex regulation may allow insiders to earn abnormal returns at the expense of outside investors.[1]

In this paper, we investigate whether complex regulation creates insider trading opportunities using the passage of one of the most impactful regulatory changes in recent history: The Tax Cuts and Jobs Act (TCJA) of 2017. The passage of the TCJA has several appealing features as a setting to examine the capital market consequences of complex regulation. First, the tax code is the most complex (i.e., specific and detailed) of all 49 Federal Code Titles (Katz and Bommarito 2014). The TCJA affects all firms operating in the U.S., and its net impact on firms' cash flows is difficult for investors to predict (Wagner, Zeckhauser, and Ziegler 2020). Thus, the TCJA is a powerful setting for examining the consequences of regulatory change on capital markets. Second, the TCJA was introduced and passed over a short time period: November 2,

[1] As discussed further in section 2, regulatory complexity may arise from (1) the language of the regulation (i.e., the bill's length and readability), (2) its economic substance (i.e., how compliance will affect firm cash flows and operations), or (3) the speed and secrecy with which the bill is passed (i.e., how much information must be absorbed when the bill passes). All three of these sources of complexity increase information asymmetry and fundamental uncertainty.

2017, to December 22, 2017. The narrow timeframe over which the TCJA passed mitigates concerns about confounding events (Schwert 1981) and presents a tractable window to look for insider trading behavior. Lastly, because it is a tax-specific regulation, its effects are confined to one financial statement line item (i.e., tax expense), and we can more easily test whether insider advantages during the TCJA's passage relate specifically to the bill's effects on firms.[2]

This question is of interest not only to researchers but also to policymakers and investors. Policymakers and regulators are interested in fair and efficient capital markets. Our study sheds light on whether new regulations inadvertently allow insiders to extract wealth from external investors. In light of the increasing complexity of U.S. regulation and the negative implications of that complexity for market efficiency (Cohen, Diether, and Malloy 2013; Davis 2017; Bennani and Neuenkirch 2023), our study underscores the responsibility of legislators to do what they can to reduce information asymmetry during and immediately after the passage of those regulations. Furthermore, our study warns investors that they may be temporarily disadvantaged when policymakers pass complex legislation.

We first validate that the passage of the TCJA is associated with increases in firms' fundamental uncertainty and information asymmetry. We proxy for firms' fundamental uncertainty using option implied volatility following Hann, Kim, and Zheng (2019) and information asymmetry using bid-ask spread and price impact. Controlling for several firm and market-wide factors, we find a significant increase in both fundamental uncertainty and information asymmetry around the passage of the TCJA. These results suggest that investors found it difficult to predict the net impact of the TCJA for firms but that some investors were better

[2] Other widespread regulations in this century include the Sarbanes-Oxley Act of 2002, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, and the Affordable Care Act. Sarbanes-Oxley and Dodd-Frank were passed openly and with bipartisan support, so although insider trading may have occurred, it would be difficult to detect because information slowly leaked over their passage. The Affordable Care Act is a reasonable alternative setting to test, though not as strong as the TCJA. As discussed in Section 5.6, we also find evidence of insider trading around the Affordable Care Act.

informed than others. This spike in information asymmetry is consistent with sophisticated investors, such as firm insiders, creating private information from public information (Kim and Verrecchia 1994).

Next, we examine the trading behavior of firm insiders around the passage of the TCJA to test whether they profit from this increase in information asymmetry. We identify daily insider purchases and sales from SEC Form 4 and measure the profitability of their trades using subsequent stock returns following Henry et al. (2024). We find that insider trades earned abnormally positive returns around the passage of the TCJA relative to other periods. This finding is consistent with firm insiders' better understanding of the implications of the TCJA for firm value than external investors. Comparing insider purchases and sales, we find the results are attributable to insider sales, consistent with insiders exploiting market over-optimism to the TCJA. In terms of economic magnitude, we find insider sales are associated with incremental abnormal returns during the TCJA passage equal to 13.14% on an annualized basis. These results are robust to alternative research designs, including different control-period windows, firm fixed effects, and entropy balancing. We also examine several placebo event periods and find no evidence of significant changes in insider trading profitability, further corroborating the importance of our examined event period. Taken together, we interpret these results as evidence consistent with the complexity of the TCJA creating insider trading opportunities.

We then perform several additional analyses to explain why insiders profited during the TCJA period and rule out alternative explanations. First, we examine whether insider trading volume changed around the TCJA. We do this because an alternative explanation for our main finding is that insiders executed fewer trades during a period of relative uncertainty, which could increase profitability per trade if insiders were especially likely to forgo trades with lower expected

profitability. Inconsistent with this explanation, we find no evidence of significant differences in insider trading volume during the TCJA. When combining this finding with our primary results, our evidence suggests that insiders benefited from more profit-per-trade and more profits in total.

Second, we conduct two sets of tests to examine whether insider profits are attributable to tax effects specifically. First, we predict that insider trade profitability should be concentrated in firms where the market is most uncertain about the effects of the TCJA. To test this, we examine whether returns to insider trading around the TCJA increase with implied analyst effective tax rate (ETR) forecast dispersion. As predicted, insider trading profits increase as analyst expectations about the TCJA's impact are less precise. Next, we test whether the results are more concentrated among insiders who are best able to anticipate the effects of the TCJA. We separately examine insiders by role (CEO, CFO, COO, General Counsel, etc.). We predict CFO and General Counsel insiders have more precise information about the firm's tax strategies and pre-existing tax laws (Kubick, Li, and Robinson 2020; Abernathy, Kubick, and Masli 2016; Goh, Lee, and Ng 2015). Consistent with this prediction, we find CFO and General Counsel insiders traded significantly more profitably than other insiders. These tests provide evidence consistent with insider trading profits increasing when insiders have more tax insight and outsiders have less tax insight.[3]

Third, we examine factors that constrain the ability of insiders to trade on private information. For instance, before the TCJA, firms with strong external monitoring had less information asymmetry between insiders and outsiders. As the TCJA is passed and nuanced changes occur, the lower information asymmetry at these firms provides outsiders with a better opportunity to anticipate and incorporate the effects of the TCJA relative to firms with higher

[3] In untabulated analyses, we estimate whether insiders' TCJA trade profitability changes with their firms' lobbying activity, both tax-related and overall, as a proxy for their political connections. We find insider trades are less profitable at lobbying firms, though the difference is not significant. We thus find no evidence that political connections explain insiders' advantage during the TCJA's passage. This provides further evidence, albeit indirect, that insiders' advantage relates to their own expertise (and not to information from private external channels).

information asymmetry. Thus, we expect monitoring to reduce the opportunity for insiders to trade profitably during the TCJA (e.g., Frankel and Li 2004; Dai, Parwada, and Zhang 2015; Hillegeist and Weng 2021; Goldman and Ozel 2023). Similarly, we expect that the costs of potential increased scrutiny and litigation following profitable trades reduce the net expected benefit of insider trades (e.g., Huddart, Ke, and Shi 2007; Pierce 2023; Kacperczyk and Pagnotta 2024). Cross-sectional tests suggest that insider trade profitability during the TCJA decreases with firm size, analyst following, institutional ownership, media coverage, and litigation risk, consistent with external forces constraining insiders' ability to profit from a superior understanding of the tax law.

Finally, we conduct exploratory analyses to assess whether insider trading profits around the TCJA relate to specific provisions of the law.[4] We find evidence that insider trading profits during the TCJA were significantly greater in multinational firms, firms impacted by repatriation provisions, and firms with NOLs at the time of the TCJA. We find no evidence that revaluation of deferred tax assets, interest expense deductibility limits, accelerated depreciation, or prior domestic production activities deductions are associated with insider trade profitability around the TCJA. These findings provide preliminary evidence about specific provisions of the TCJA that the market may have had trouble understanding relative to insiders.

Overall, our evidence is consistent with the following explanation: when Congress first revealed the TCJA, investors fixated on the positive implications of the bill (e.g., the reduction of the corporate tax rate from 35% to 21%) and failed to appreciate other nuances in the bill with less positive implications (e.g., the one-time deemed cash repatriation and other liabilities imposed by complicated multinational provisions). Firm insiders, who observed the same public information

[4] We do not make *ex-ante* predictions regarding the association between insider trading profitability and the magnitude of TCJA effects. Insider profits could be concentrated in trades of highly affected firms (e.g., market underestimates TCJA effects), less affected firms (e.g., market overestimates TCJA effects), or both.

as everyone else but uniquely understood how the bill would impact their firm (e.g., how much cash held overseas or the level and location of NOLs), felt that the initial price reaction was too positive, and sold their firm's shares. These actions generated positive insider trading profits. Figure 2 graphically depicts this explanation.

We make several contributions to the literature. First, we contribute to the broad literature examining the costs of regulation. Prior studies suggest that regulation is increasing in complexity over time, costly to regulated firms, and that the high cost of regulatory compliance puts small firms at a disadvantage compared to large firms (Davis 2017; Calomiris et al. 2022; Trebbi et al. 2023; Kalmenovitz 2023; Singla 2023). Recent studies suggest that the uncertainty around regulation is also costly to the capital markets (e.g., Baker, Bloom, and Davis 2016). We build on this literature by providing evidence that regulation temporarily increases the information asymmetry between investors, specifically between firm insiders and outsiders. Similar to prior findings that regulation disadvantages smaller firms in product markets, we find evidence that regulation disadvantages outside investors in capital markets. Policymakers and researchers might weigh these costs against other factors when evaluating the net social value of regulation or the process in which regulatory changes are implemented.

Second, we contribute to the extensive literature examining the corporate tax effects of the TCJA.[5] Proponents of the TCJA marketed the legislation as beneficial for working-class families (Slemrod 2018). Nevertheless, empirical analyses generally conclude that the TCJA increased income inequality in the U.S. (Bivens 2017; Altig et al. 2020; Kennedy, Dobridge, Mortenson, and Landefeld 2022; Kallen and Mathur 2021). Our study highlights that the TCJA might have inadvertently exacerbated inequality by allowing firm executives to profit from trades with less

[5] Jeff Hoopes curates a list of studies in this literature available at https://tax.kenaninstitute.unc.edu/what-do-we-know-about-the-effects-of-the-tax-cuts-and-jobs-act.

informed investors. Our evidence also highlights that *uncertainty* about tax reform can have public welfare implications. These implications are particularly relevant given that the same political party that enacted the TCJA (i.e., the Republican party) has recently gained control of the U.S. presidency and Congress and is currently formulating responses to the many TCJA provisions scheduled to sunset in the near future.

Lastly, we contribute to the insider trading literature (e.g., Aboody and Lev 2000; Ke, Huddart, and Petroni 2003; Cohen, Malloy, and Pomorski 2012; Chi, Pincus, and Teoh 2014; Dechow, Lawrence, and Ryans 2016; Chung, Goh, Lee, and Shevlin 2019; Jagolinzer, Larcker, Ormazabal, and Taylor 2020; Arif, Kepler, Schroeder, and Taylor 2022). As it specifically pertains to taxes and insider trading, Chi et al. (2014) examine whether insiders trade on the market's inability to understand the implications of tax expense for future pretax earnings, and Chung et al. (2019) examine whether opacity associated with tax avoidance increases insider trade profitability. Goldman and Ozel (2023) document that insiders alter the profitability of their insider trades in response to changes in individual tax rates. We are the first to examine a setting where insiders trade on the market's inability to predict future tax expense itself.

II. BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1 Background

2.1.1 Regulatory complexity

We define regulatory complexity as the processing resources required for a decision-maker to understand the economic substance and consequences of regulation, which is consistent with how the literature defines complexity in capital market contexts.[6] Under this definition, regulatory complexity may arise from the language of the regulation (i.e., the bill's length and readability),

[6] For example, Bernard et al. (2023, 1) define business complexity as "the processing resources required for a decision-maker to understand the economic substance of the business's transactions and financial position."

its economic substance (i.e., how compliance will affect firm operations), and the speed and secrecy with which it is passed (i.e., how much information must be absorbed when the bill passes). In all cases, greater complexity increases investors' processing costs, which, in turn, increases information asymmetry and fundamental uncertainty to the extent investors face differential (1) processing costs or (2) benefits from predicting the firm-specific consequences of regulation.

Measured across multiple dimensions, the scope and complexity of regulations in the U.S. have dramatically increased over time. The upward trend in regulatory complexity has been noticeable in recent decades (Davis 2017). Although regulatory complexity is increasing broadly, this trend is arguably especially pronounced in tax regulation (Baker et al. 2016; Davis 2017; Ruhl and Katz 2015). Consistent with this, Katz and Bommarito (2014) rank the Internal Revenue Code (Title 26) as the most complex title of the U.S. Code in specificity and detail. Pundits, politicians, and academics regularly propose simplifying the complexity of U.S. regulations, including the tax code (McLaughlin and Williams 2014; Burgess 2010; Carter 2023; Michel 2023; Burman and Gale 2001; Davis 2017). However, no proposal of this sort has gained traction in recent years.

Regulatory complexity can arise as a rational response to societal needs associated with population growth and economic complications, and it can improve overall social welfare (Mulligan and Shleifer 2005; Aghion, Algan, Cahuc, and Shleifer 2010; Egorov and Harstad 2017). However, complex regulations can also impose significant economic costs. Empirical studies find that regulatory complexity (including tax system complexity) is associated with lower employment, sales, capital investment, efficiency, innovation, and firm competition (e.g., Kalmenovitz 2023; Calomiris et al. 2022; Trebbi et al. 2023; Djankov, La Porta, Lopez-de-Silanes, and Shleifer 2002; Aghion, Bergeaud, and Van Reenen 2021; Klapper, Laeven, and Rajan 2006; Amberger, Gallemore, and Wilde 2023; Zwick 2021). Furthermore, even when designed to protect

vulnerable parties, regulations can have the unintended consequence of punishing younger and smaller firms because regulatory costs are often fixed without regard to scale (Singla 2023; Crews Jr. 2023; Crain and Crain 2010).

2.1.2 The Tax Cuts and Jobs Act

In the late summer of 2017, after failing to pass healthcare legislation, U.S. President Donald Trump and Republican members of U.S. Congress turned their attention towards enacting tax legislation. Republicans were under mounting pressure to deliver a major legislative victory, fulfilling campaign promises to the public and their donors (Cary, Holmes, and Rebala 2019). To that end, Republicans introduced the bill that would become the TCJA in the House on November 2, 2017. In light of Republicans' failure to pass healthcare legislation, their slim majority in the U.S. Senate, and their internal divisions over what to include with tax reform, the final contents of tax reform and the likelihood of its passage were largely uncertain at this point (e.g., White 2017; National Foreign Trade Council 2017). Appendix B provides an overview of the legislative history of the bill, including dates associated with higher search volume for information about tax reform or significant market reactions.

Partially to prevent anyone from mounting opposition to their proposed tax legislation, Republicans hurried the TCJA through the legislative process (Kleinbard 2017; Cary et al. 2019; Kamin et al. 2019). At one point, Senators were required to vote on the bill just hours after first receiving it, with handwritten amendments to prior handwritten amendments in the margins (Jansen 2017). The TCJA spent only 51 days in Congress from its introduction until its signature by President Trump on December 22, 2017. For comparison, the preceding U.S. tax reform in 1986 spent 323 days in Congress, more than six times longer. Kamin et al. (2019) describe the rush to

pass the TCJA as "denying legislators and the public sufficient time to analyze the provisions of the legislation – many of which are highly complex."

The corporate tax provisions that were ultimately passed as part of the TCJA were wide-ranging and included favorable and unfavorable provisions for firms.[7] Although public firms' ETRs were lower on average after the TCJA, the tax savings were distributed unevenly, and a significant portion of public firms experienced *higher* ETRs after the TCJA (Henry and Sansing 2020; Wagner et al. 2020; Dobridge, Kennedy, Landefeld, and Mortenson 2023; Dyreng, Gaertner, Hoopes, and Vernon 2023). Consistent with the overall reduction in corporate tax burdens, the market as a whole reacted positively to the TCJA's passage (Wagner, Zeckhauser, and Ziegler 2018). However, Wagner et al. (2020) find that stock returns during the passage of the TCJA were associated with imprecise proxies for TCJA exposure and were not further associated with firms' ETR changes in the wake of the TCJA. Wagner et al. (2020) conclude that investors relied on imprecise proxies and struggled to impound the precise firm-specific tax effects of the TCJA until weeks after its enactment.[8,9] Furthermore, even sophisticated external stakeholders like financial analysts struggled to incorporate TCJA provisions into their expectations, as demonstrated by increased analyst forecast error (Chen and Koester 2023).

2.1.3 Insider trading

The SEC's mission includes protecting investors and maintaining fair, orderly, and efficient capital markets. To support this mission, SEC Rule 10b5 prohibits officers, directors, and

[7] For a more extensive list of major corporate tax provisions in the TCJA and their respective ETR implications, see Wagner et al. (2020) and Dobridge et al. (2023).

[8] Although the TCJA simplified many aspects of tax compliance for individuals, some of its business tax provisions were notoriously complex, with practitioners unclear on their requirements even weeks after its passage (e.g., Gale, Gelfond, Krupkin, Mazur, and Toder 2018; Gleckman 2018).

[9] Wagner et al.'s (2020) finding belongs to a broader body of evidence that even sophisticated information consumers can struggle with complex tax information (Chen and Schoderbek 2000; Chen, Danielson, and Schoderbek 2003; Plumlee 2003; Weber 2009; Hoopes 2018; Kim, Schmidt, and Wentland 2020).

significant shareholders—collectively referred to as "insiders"—from buying or selling shares while using material, non-public information. Further, the SEC requires insiders to report their trading activity publicly by filing SEC Form 4 within two days of trading. The SEC investigates potential insider trading abuses and issues SEC enforcement actions if it determines an insider traded on private information. Consequently, although trading on private information could be profitable, the significant risk of SEC detection constrains this behavior (e.g., Huddart et al. 2007; Pierce 2023; Kacperczyk and Pagnotta 2024; Goldman and Ozel 2023). To avoid the appearance of impropriety, many public companies voluntarily restrict insider trading during "blackout periods" between news releases (e.g., earnings announcements).[10]

Despite these constraints, insider trading positively predicts future earnings and abnormal returns, suggesting that insiders do trade on information that is not yet impounded into stock price (e.g., Ke et al. 2003; Piotroski and Roulstone 2005). Prior studies have investigated several sources of insiders' private information, including SEC investigations, SEC comment letters, non-public contractual terms, geographic connections to significant events, political connections, research and development, the audit process, and even public information when investors are inattentive (Blackburne, Kepler, Quinn, and Taylor 2021; Dechow et al. 2016; Thompson, Urcan, and Yoon 2023; Henry et al. 2024; Jagolinzer et al. 2020; Aboody and Lev 2000; Arif et al. 2022; Alldredge and Cicero 2015). Our study is the first to examine legislative complexity as a potential source of insider advantage.

As it specifically pertains to taxes and insider trading, Chi et al. (2014) examine whether insiders trade on the market's inability to understand the implications of tax expense for future

[10] The TCJA was introduced in November and December, which likely overlaps with some blackout periods. We examine several placebo event dates in non-TJCA years and fail to replicate our inferences, which helps alleviate the concern that the effect is explained by confounding factors associated with the time of year that the TCJA was passed (e.g., blackout periods).

pretax earnings, and Chung et al. (2019) examine whether opacity associated with tax avoidance increases insider trade profitability. Goldman and Ozel (2023) document that insiders alter the profitability of their insider trades in response to changes in individual tax rates.[11] We are the first to examine a setting where insiders trade on the market's inability to predict future tax expense itself and the first to suggest that the legislative process of revising taxes can inadvertently create trading opportunities for firm insiders.

2.2 Hypothesis Development

It is possible that the TCJA's passage provided insiders with an information advantage in the market. In general, estimating firms' tax liabilities using public information is a difficult exercise (e.g., McGill and Outslay 2002; Hanlon 2003; McGill and Outslay 2004; Donohoe, McGill, and Outslay 2012). As a result, often the best predictor of future tax expense available to external investors is past tax expense. When past tax expense is less predictive of future tax expense, such as when tax law changes, outside investors might find it especially difficult to predict future cash flows. Consistent with this notion, prior studies suggest that investors and analysts struggled to predict the TCJA's effects (Wagner et al. 2020; Chen and Koester 2023).

In contrast, insiders have access to detailed, private information about their firm's operations and tax positions. This detailed information should allow insiders to more precisely estimate the impact of specific TCJA provisions compared to outsiders. For example, the calculation to determine the tax liability for the deemed repatriation of earnings from a foreign subsidiary under IRC §965 requires information about the source jurisdictions of historical earnings, level of foreign cash holdings, and the firm's percentage ownership in the subsidiary

[11] The TCJA decreased individual tax rates, but that change was much smaller in magnitude than the decrease to the corporate tax rate. Goldman and Ozel (2023) suggest a decrease in individual tax rates should weaken managers' incentives to generate insider trading profits, which might bias our results towards zero.

(among other information). An insider likely knows more about these details than external investors and consequently can likely more accurately predict their firm's repatriation tax liability. Further, the TCJA likely had real effects that changed the operating, investing, and financing decisions made by managers (e.g., Carrizosa, Gaertner, and Lynch 2023; Lynch, Pflitsch, and Stich 2023; Crawford and Markarian 2024). Because insiders control these decisions, they could better anticipate how the TCJA impacts future cash flows indirectly through changes in operations.

Lastly, relative to diversified investors, insiders' personal wealth is more strongly tied to their specific firm. Consequently, insiders have a stronger incentive to understand the implications of the TCJA for their firm compared to diversified investors who must predict the TCJA's implications for many firms. This stronger incentive could justify insiders dedicating more time and resources to understanding the implications for their firm. Furthermore, this difference in incentives is likely compounded for insiders with expertise in tax law, for whom the new law's rules should be easier to parse.

Overall, given insiders' private information, control of their firm, and strong incentives to figure out the implications of the TCJA for their firm, we predict that insiders have a greater information advantage than usual during the legislative period in which details about the TCJA became public, allowing them to execute more profitable trades. Stated in the alternative, we hypothesize that:

> ***H1****: Relative to other periods, insiders trade more profitably during the passage of the TCJA.*

Nevertheless, there are reasons to believe the TCJA's passage may not be associated with more profitable insider trading. First, is it possible that insiders are disadvantaged in processing information about the TCJA. Prior research suggests that macroeconomic events and discrete tax events decrease the accuracy of manager tax forecasts relative to analyst forecasts (Hutton, Lee,

and Shu 2012; Bratten, Gleason, Larocque, and Mills 2017). Bratten et al. (2017) specifically find that tax complexity degrades both managers' and analysts' forecast accuracy, but the association is significantly stronger for managers' forecasts. If managers struggle with tax complexity relative to sophisticated information processors, as Bratten et al.'s (2017) findings suggest, the high volume of complex TCJA-related information may, in fact, disadvantage insiders relative to the market. Second, the costs of trading based on private information could outweigh the monetary benefit of more profitable trades. Insiders are legally prohibited from trading while in possession of material nonpublic information, and prior evidence suggests that the risks of negative publicity and legal action constrain insider trading (e.g., Huddart et al. 2007; Pierce 2023; Kacperczyk and Pagnotta 2024).[12] It is not clear that insiders would tolerate these risks in our setting. For both of these reasons, the overall association between the TCJA's passage and insider trade profitability remains an empirical question.

III. RESEARCH DESIGN

3.1 Empirical Model

To examine abnormal insider trading profitability during tax reform passage, we estimate the following OLS regression:

$$Profit_{i,t} = \beta_0 + \beta_1 TCJA_{i,t} + \beta_2 LnMVE_{i,t} + \beta_3 MTB_{i,t} + \beta_4 ROA_{i,t} + \beta_5 Prior\ Qtr\ Ret_{i,t} + \beta_6 Recent\ EA_{i,t} + \beta_7 Busy\ EAs_t + Industry_j + \epsilon_{i,t} \quad (1)$$

Following Henry et al. (2024), we define the dependent variable in equation 1, $Profit$, as the 30-day buy-and-hold return following insider transactions less the 30-day buy-and-hold return on a portfolio of firms matched on size, book-to-market ratio, and momentum (Daniel, Grinblatt, Titman, and Wermers 1997), multiplied by negative one for firm-days with net insiders sales. We

[12] Section 10(b) of the 1934 Securities and Exchange Act and the associated rules adopted by the SEC establish civil and criminal liability for trades executed by insiders while in possession of material nonpublic information.

also multiply the return by 100, so that coefficients can be interpreted as percentage returns (e.g., a one-unit increase in *Profit* indicates a one percentage increase in returns). Higher values of *Profit* indicate higher insider trade profitability.

The independent variable of interest in equation 1 is $TCJA$, an indicator variable for observations during the passage of the TCJA. We define passage of the TCJA as starting with its introduction to the U.S. House of Representatives on November 2, 2017, and ending with its signature by President Donald Trump on December 22, 2017. Stock market reactions and online searches for information about the TCJA were largely concentrated in this window (Kalcheva, Plečnik, Tran, and Turkiela 2020; Gaertner, Hoopes, and Williams 2019).[13] A positive coefficient on *TCJA* ($\beta_1 > 0$) indicates insiders earned abnormal profits on trades of their firms' stock during the passage of the *TCJA*, consistent with insiders profiting from their superior understanding of the implications of the complex regulation for their firm. If managers don't have private information or don't trade on private information, we would not expect a significant coefficient on *TCJA*. Finally, if managers predict the TCJA's effects less accurately than the market (e.g., Bratten et al. 2017) we may observe that insiders' trades are less profitable during the TCJA ($\beta_1 < 0$).

Equation 1 includes controls for the market value of equity (*LnMVE*), market-to-book ratio (*MTB*), firm pretax profitability (*ROA*), the buy-and-hold return over the last three months (*Prior Qtr Ret*), the release of an earnings announcement for the firm in the last two weeks (*Recent EA*), the number of earnings announcements during the day of the trade (*Busy EAs*), and industry fixed effects. These controls help ensure that the coefficient on *TCJA* does not capture risk factors or contemporaneous releases of earnings information. Throughout all analyses, we winsorize

[13] Gaertner et al. (2019) and Kalcheva et al. (2020) include the announcement of a "Unified Framework" for tax reform on September 27, 2017 as a major event date that increased the probability of the tax reform passage. Because the September 27 announcement lacked substantive details, we do not expect it to advantage insiders in the same way as the first full release of the bill's provisions in the House in November. Consistent with these expectations, we do not find significant differences in insider trade profitability during the window from September 27 to November 1, 2017.

continuous variables at the 1st and 99th percentiles and cluster standard errors by firm. Appendix A provides full variable definitions.

3.2 Sample

Table 1 presents our sample selection process. Following prior studies, we limit our sample to firm-days with trades by insiders with the following titles: CEO, CFO, CIO, COO, CTO, president, executive or senior vice president, or general counsel (Davidson, Dey, and Smith 2020; Goldman and Ozel 2023). We identify daily insider purchases and sales of common stock during the period January 1, 2017 to December 31, 2018 from the Thomson/Refinitiv Insiders Table 1 database, which collects data from SEC Form 4. We identify 41,664 firm-days with insider trades among 3,894 unique firms. Our primary analyses also require daily returns data from CRSP and accounting data from Compustat. The majority of sample attrition results from missing dataset links. These data requirements reduce our final sample to 35,906 firm-day observations and 3,152 unique firms (a total sample loss of 13.8%). The sample in some of our additional analyses differ from this final sample because they shift the sample period (e.g., placebo tests), include days with no insider trading (e.g., our TCJA setting validation test), or impose additional data requirements (e.g., tests requiring institutional ownership data).

3.3 Descriptive Statistics

Table 2 presents descriptive statistics for our primary sample. Panel A reports summary statistics for the pooled sample. Panel A shows the mean and median insider trades are profitable (0.129% and 0.202%, respectively), but there is significant variation in their profitability (std deviation = 8.856%). About 9.5% of our observations occurred during the TCJA passage window from November 2 to December 22, 2017. Panel B partitions the sample between observations occurring during the TCJA passage (*TCJA* = 1) and observations occurring outside of this window

(*TCJA* = 0). The significantly higher mean and median *Profit* for observations occurring during the TCJA window provide some initial evidence that insiders benefited during the TCJA window. However, several control variables are also significantly different for observations in the TCJA window, suggesting these factors might be important controls. Panel C reports Spearman and Pearson correlations above and below the diagonal, respectively. Similar to Panel B, Panel C shows *TCJA* is positively associated with insider trading profit (*Profit*) but also significantly correlated with firm *LnMVE*, *Recent EA*, and *Busy EAs*. Overall, the descriptive statistics appear in line with prior studies and provide some initial evidence that insider trading was more profitable during the TCJA passage period relative to control periods.

IV. MAIN RESULTS

4.1 Validation of the TCJA Setting

Before investigating our primary research question, we first examine the impact of the TCJA passage on the capital market information environment more generally. This test validates our main test's premise that the TCJA had an economically meaningful impact on uncertainty and information asymmetry. For this test, we investigate how abnormal option implied volatility (*Abn. Implied Volatility*), abnormal bid-ask spread (*Abn. Spread*), and abnormal price impact (*Abn. Impact*) changed around TCJA's passage. We expect that the complex provisions of the TCJA, along with its breakneck speed through Congress, likely made it difficult for investors to predict its impact on firm values. Consequently, we predict the TCJA will be associated with increased uncertainty about firm fundamentals (*Abn. Implied Volatility*) measured following Hann et al. (2019). Furthermore, given investors' differential ability to process this new information, we predict the TCJA will be associated with increased information asymmetry between investors (*Abn. Spread* and *Abn. Impact*).

Table 3 reports estimates from regressing these three outcomes on *TCJA* and the control variables and industry fixed effects from Equation 1.[14] As predicted, Table 3 shows that the *TCJA* period is associated with significantly higher abnormal option implied volatility (Column 1; β = 0.056, t-stat = 7.54), abnormal bid-ask spread (Column 2; β = 0.027, t-stat = 2.47), and abnormal price impact (Column 3; β = 0.040, t-stat = 5.08). Overall, the passage of the TCJA appears to have measurably impacted the information environment of capital markets. More specifically, the market seems to have been uncertain about the implications of the TCJA, with this uncertainty spread unevenly among investors.[15] These results help validate the TCJA as a complex regulation, creating market conditions that insiders could potentially exploit.

4.2 Insider Trading Profitability

Next, we turn to our primary analysis, which examines whether the TCJA created abnormally profitable insider trading opportunities. We start by plotting the average profitability of insider trading over time near the TCJA passage period as an initial descriptive assessment. Figure 1 shows the average insider trade profitability (*Profit*) by week for the 7-week TCJA period and the adjacent 7-week periods using both the mean (Panel A) and the median (Panel B). Panel B presents both the median and interquartile range of trades by week. We find a stark spike in insider trading profitability that coincides closely with the TCJA passage period.

Table 4 reports estimates of Equation 1. Columns 1 and 2 examine all insider trades (both insider purchases and insider sales). We estimate the coefficient on *TCJA,* both with and without control variables, to assess their impact on our inferences (Whited, Swanquist, Shipman, and Moon 2022). We find a significantly positive coefficient on *TCJA* in Column 1 (β = 0.781, t-stat = 3.00)

[14] The sample size for the validation tests differs from the main sample because we add days with zero insider trading and require data for dependent variables.

[15] These results are also consistent with concurrent work by Fuste (2021), who examines information asymmetry created by the TCJA.

and Column 2 (β = 0.783, t-stat = 3.05), consistent with abnormally high insider trading profitability around the passage of the TCJA. Notably, the estimated coefficient is stable after adding controls in Column 2 (β of 0.781 vs 0.783). We next isolate insider purchases (Columns 3 and 4) and insider sales (Columns 5 and 6) and find that the results are attributable to insider sales (Column 6; β = 1.020, t-stat = 3.80), consistent with insiders selling their stock before the stock underperformed. In annualized terms, the 0.78% and 1.02% 30-day abnormal returns estimated in Columns 2 and 6 translate to 9.95% and 13.14% annual abnormal returns. In sum, the evidence in Table 4 is consistent with insiders exploiting their superior understanding of the firm value implications of the TCJA for their own gain.

To see what market patterns insiders exploit during the TCJA's passage, in Figure 2, we plot returns from September 2017 to March 2018 for the set of firms sold by insiders during the TCJA's passage ("TCJA-traded firms"). Panel A depicts the cumulative unadjusted buy-and-hold returns for the equal-weighted portfolio of TCJA-traded firms relative to the portfolio of other firms in our sample. In Panel B, we narrow the TCJA-traded firm portfolio to the subset of firms that are traded profitably by insiders. In both panels, we observe that TCJA-traded firms' stock performance closely tracks other firms in September 2017, begins to diverge upward in early October, and remains noticeably elevated during the TCJA's passage before declining back towards the other firm's performance in January through March of 2018. In summary, although the entire market experienced a dramatic rise in prices during these months, the firms that insiders traded during the TCJA's passage temporarily experienced even greater highs as it worked through the legislative process. This pattern is consistent with insiders taking advantage of market over-optimism about the degree to which their firms would benefit from the TCJA.

4.3 Robustness Tests

We perform a series of robustness tests to investigate if our estimates are sensitive to alternative research designs and to rule out alternative explanations. We present this analysis in Table 5. Panel A presents estimates of Equation 1 with alternative fixed structures. We find our primary results are robust to the inclusion of firm, weekday, or firm & weekday fixed effects. These tests rule out alternative explanations related to time-invariant firm differences and weekday effects. Said differently, these robustness tests suggest that for an omitted variable to explain the primary results, it would need to be orthogonal to the controls, vary within firm, and align with the specific timing of the TCJA passage. Furthermore, in untabulated analyses, we re-estimate Panel A after entropy balancing the first three moments of control variables between *TCJA* = 0 and *TCJA* = 1 observations and find qualitatively similar results, which alleviates concerns of functional form misspecification.

Table 5, Panel B presents results using alternative control windows. The sample from our primary results includes the calendar years 2017 and 2018, a 2-year control window around the passage of the TCJA. Column 1 of Panel B presents our main estimate from this specification again for reference. The choice of control window is potentially important to our results because the coefficient on *TCJA* estimates the average difference in insider trading profitability between the TCJA period and the control period. Abnormally low profitability in the control window could explain a positive coefficient. To help rule out this concern, Columns 2 through 5 present estimates of Equation 1 using alternative control window lengths of 4 months, 6 months, 1 year, and 6 years, respectively. We continue to find significantly positive coefficients on *TCJA* in each control window examined. Thus, we find no evidence that the high profitability of insider trades during TCJA passage is sensitive to the choice of comparison periods.

4.4 Placebo Tests

One alternative explanation that our robustness tests cannot completely rule out is that there is something unique about the period November 2 to December 22 each year and that our results are explained by this time of year rather than the TCJA specifically. Relatedly, our results might just be capturing routine trades that occur each year at the same time and have little to do with unusual trading patterns due to the TCJA and insider information. We perform several placebo tests to rule out these alternative explanations. Column 1 of Table 6 shifts our sample period back one year, replacing the *TCJA* indicator with a *Placebo* indicator equal to one for observations of insider trades between November 2, 2016 and December 22, 2016. Column 2 of Table 6 shifts our sample period forward one year, replacing the *TCJA* indicator with a *Placebo* indicator equal to one for observations of insider trades between November 2, 2018 and December 22, 2018. Lastly, Column 3 of Table 6 examines a 6-year sample from 2015 to 2020, with the *Placebo* indicator equal to one if the insider trade occurred between November 2 and December 22 of any year *except* 2017 (i.e., any year except when the TCJA was passed). As shown in Table 6, we find insignificant coefficients on *Placebo* when we estimate these three alternative specifications. This result suggests that our results are not explained by incidental non-TCJA-related events that occur in November or December.

In combination with our robustness tests, the placebo test results suggest our primary results are not an artifact of sample period choices, between-firm differences, or linear form misspecification, and provide some comfort that our results are attributable to the TCJA.

V. ADDITIONAL ANALYSES

5.1 Insider Trading Volume

Our main results suggest that insiders made more profitable trades around the passage of the TCJA. However, our results do not speak to the frequency or size of insider trades during that period. An alternative explanation for our main results is that the heightened uncertainty around the TCJA leads to *less* insider trading, which could increase profitability per trade if insiders were especially likely to forgo trades with lower expected profitability. To investigate this possibility, we first plot the trend of insider trading volume (in dollars) around the TCJA period in Figure 3. Figure 3 shows a sudden increase in insider trading volume at the introduction of the TCJA (week 0 in Figure 3), which trails downward after the TCJA was signed into law (week 7 in Figure 3). This pattern provides descriptive evidence consistent with the TCJA leading to more, not less, insider trading.

Next, we compare descriptive statistics of insider trading frequency and size for insider trades that occurred during vs. outside the TCJA period (*TCJA* = 1 vs. *TCJA* = 0). Panel A of Table 7 presents these summary statistics and t-tests of differences in means across the sample partitions. First, we measure the propensity for insiders to trade, using an indicator variable equal to one if a firm's insiders traded on that trading day (*Transaction01*). On a univariate basis, we find that insiders were more likely to execute trades during the TCJA period. Next, we examine several measures of insider trading volume based on the number of shares traded, the dollar value of shares traded, and shares traded as a percent of the firm's total shares outstanding. Overall, we find that the mean value for all three of these measures is higher during the TCJA period; however, the difference in means is only significant for insider trades as a percentage of total shares outstanding

(*Trade Size - % Shares Outstanding*). This result provides additional evidence consistent with the TCJA leading to more insider trading (not less).

Lastly, we estimate multivariate regressions to control for other factors. In Panel B of Table 7, we find that after adding controls, none of the positive associations between *TCJA* and insider trading volume remain significant.[16] Consequently, we do not conclude that the TCJA increased insider trading frequency or volume. However, the positive point estimates in Panel B and significant univariate differences in Panel A suggest that decreased insider trading is an unlikely explanation for our main results. Together with our main results, this evidence is consistent with insiders profiting more per trade and more in total.

5.2 Analyst Tax Rate Forecast Dispersion

If our main results are explained by insiders predicting the consequences of the TCJA better than investors, then our results should be concentrated in firms where investors had the most difficulty predicting the impact of the TCJA. This notion follows Chen and Koester (2023), who demonstrate that, on average, analysts had difficulty predicting the effects of the TCJA. To test our prediction, we proxy for the market's tax uncertainty using the dispersion of analysts' implied ETR forecasts. We calculate implied ETR forecasts as the difference between forecasts for pretax income and net income issued by the same analyst on the same day, scaled by the pretax income forecast. We then measure the dispersion of implied ETR forecasts for the quarter in which the TCJA first impacted tax expense (i.e., Q4 2017 for firms with calendar fiscal years) issued during the TCJA's legislative window from November 2 to December 22, 2017.[17] More specifically, we proxy for forecast dispersion using the standard deviation (*Tax AFD Std. Dev.*), variance (*Tax AFD Variance*), interquartile range (*Tax AFD IQR*), and total range (*Tax AFD Range*) of implied ETR

[16] We scale *Trade Size - # Shares* and *Trade Size - Dollars ($)* by 1,000 in Panel B for ease of interpretation.
[17] If a single analyst issues multiple implied ETR forecasts during this window for the same firm-quarter, we use only the latest.

forecasts. We predict that insiders benefited more at firms where analysts were less certain about TCJA-related tax expense during the period in which information about the bill was released.

Table 8 reports estimates of Equation 1 after interacting *TCJA* with the tax forecast dispersion proxies. Columns 1, 2, 3, and 4 present the results after interacting the TCJA indicator with the standard deviation, variance, interquartile range, and total range of ETR forecasts, respectively. Across all columns, we estimate a positive and significant coefficient on the interaction term (β ranging from 0.720 to 0.640, t-stat ranging from 9.23 to 2.05). This coefficient indicates that the profitability of insider trades during the TCJA period increases with the magnitude of analyst tax forecast dispersion. Overall, the evidence in Table 8 is consistent with insiders having more profitable trading opportunities during the TCJA when the market had less precise expectations about the legislation's tax effects.

5.3 Insider Tax Expertise

In a previous analysis, we examine whether insiders traded more profitably when the market was less certain about the impact of the TCJA. Next, we examine whether insiders traded more profitably when the insiders were more certain about the impact of the TCJA. Specifically, we assume insiders with tax expertise could better predict the implications of the TCJA and test whether these insiders traded more profitably than insiders without tax expertise during the TCJA period. To do so, we separate insiders by title (e.g., CEO, CFO, COO, general counsel, etc.) and estimate insider trading profits (Equation 1) separately for each type of insider. We predict that CFOs' tax experience (Kubick et al. 2020) and General Counsels' role in tax planning (Abernathy et al. 2016; Goh et al. 2015) will allow insiders in these positions to trade most profitably during the TCJA period.

Table 9 reports estimates of Equation 1 separately for each type of insider. We present our main results with all insiders in Column 1 as a benchmark to test coefficient differences. The sample size is reduced when limiting to specific types of insiders because, following prior studies, we only include days where insiders traded in our sample. Although we find positive coefficients on *TCJA* for all insiders, only the coefficients for CFOs and General Counsels are statistically significant (Columns 3 and 7, respectively) and significantly different than the coefficient from our baseline model in Column 1 (Chi-squared statistics presented at the bottom of the table). This evidence suggests that both CFOs and GCs traded more profitably during the TCJA period, consistent with them benefiting from their familiarity with their firm's tax operations and tax law. Overall, this evidence is consistent with our inference that the abnormal trading profits during the TCJA period are related to uncertainty about the firm's future taxes.

5.4 External Monitoring

We expect that external monitors reduce information asymmetry and the opportunity for insiders to trade profitability during the TCJA (e.g., Frankel and Li 2004; Dai, Parwada, and Zhang 2015; Hillegeist and Weng 2021; Goldman and Ozel 2023). Consequently, firms with stronger external monitors already had lower information asymmetry, and the external stakeholders could presumably better anticipate the effects of the TCJA. We test this prediction with several measures of external monitoring: (1) firm size, (2) analyst following, (3) media coverage, (4) institutional ownership, (5) short volume prior to the TCJA, and (6) litigation risk. We measure *Size* as total assets, *Analyst Following* as the natural log of one plus the number of analysts forecasting for the firm for the fiscal year, *Media Coverage* as the number of media articles and news flashes about the firm reported during the fiscal year from RavenPack, and *Institutional Owners* as the number of 13-F institutional owners. *Recent Short Volume* equals the average short volume scaled by

shares outstanding over the days *t-80* to *t-20*. Finally, we measure *Litigation Risk* as the estimated probability of litigation following Kim and Skinner (2012).

Table 10 estimates Equation 1 with the addition of an external monitoring measure and its interaction with the TCJA period indicator. We find in Column 1 of Table 10 that the interaction term between *Size* and *TCJA* is negative and significant (β = -0.434, t-stat = -2.89), which suggests that insider trading profitability increased less during the TCJA period for insiders at larger firms. We also estimate negative and significant interaction coefficients between *TCJA* and *Analyst Following* (Column 2), *Media Coverage* (Column 3), *Institutional Owners* (Column 4), and *Litigation Risk* (Column 6). However, we do not find that *TCJA* significantly varies with *Recent Short Volume* (Column 5; t-stat = -1.39).

Overall, we find evidence consistent with external monitors constraining managers' ability to trade profitably on private information during the TCJA period. This notion is consistent with either (1) external monitors accelerating price discovery for these firms such that managers were not able to exploit mispricing for these firms and/or (2) external monitors deterring managers from trading on private information. In either case, the results are consistent with our predictions and suggest that external monitors attenuate the regulatory cost of information asymmetry.

5.5 Specific TCJA Provisions

For our last analysis, we explore what specific provisions in the TCJA are associated with abnormal insider trading profitability. We don't make any *ex-ante* predictions for which TCJA provision will be associated with abnormal profitability because there is no well-defined theory for which provision investors might misunderstand. For each provision, insider profits could be concentrated in trades of highly affected firms (e.g., because the market underestimates the provision's effects), less affected firms (e.g., because the market overestimates the provision's

effects), or both. Consequently, whether specific provisions benefit insiders at highly affected firms is ambiguous.

We focus on the TCJA's most economically significant corporate tax effects: changes to the taxation of foreign income and deemed repatriation of foreign cash holdings, the revaluation of deferred tax assets to reflect the lower corporate tax rate, the new interest deductibility limit, the changes to NOL deductions, immediate expensing of long-lived tangible assets, and the repeal of the domestic production activities deduction.[18] We examine five proxies to capture multinational firms and those impacted by the deemed repatriation of foreign earnings: an indicator variable equal to one for observations with foreign pretax income greater than zero (*Multinational*), the natural log of one plus the number of foreign jurisdictions disclosed in Exhibit 21 (# *Jurisdictions*), equity method investments scaled by assets (*Equity Invst.*), permanently reinvested foreign earnings scaled by assets (*PRE*), and cash scaled by assets (*Cash*). Turning to the other provisions, we capture tax asset revaluation using net deferred tax assets scaled by total assets (*DTAs*), the interest deductibility limit using an indicator for interest expense greater than interest income plus 30% of EBITDA (*Interest Limit*), NOL deduction changes using an indicator for any beginning-of-year NOLs (*NOL*), immediate expensing using gross property, plant, and equipment scaled by assets (*PPE*), and the domestic production activities deduction using an indicator for 10-K mentions (*DPAD*).

As shown in Table 11, we interact each provision variable with the *TCJA* indicator to estimate how insider trading profits vary with the firm's exposure to each provision. Panel A reports estimates using each of the five proxies for exposure to the multinational and/or repatriation

[18] Excluding the headline corporate tax rate reduction from 35% to 21%, these provisions have the greatest anticipated impact on aggregate U.S. tax collections and they affect the highest percentage of publicly traded U.S. firms (Joint Committee on Taxation 2017; Dobridge et al. 2023).

provisions. We find the impact of TCJA on insider trading profits is significantly larger for multinational firms (Column 1), firms with more foreign jurisdictions (Column 2), firms with more permanently reinvested earnings (Column 4), and firms with more cash (Column 5). We do not estimate a significant interaction term for *Equity Invst.*, but the coefficient is positive and approaching significance (Column 3; t-stat = 1.61). Panel B reports estimates using the proxies for the other provisions. We only find a significant interaction term for *NOLs* in Column 3. The positive interaction coefficient suggests that insider trading profits were larger during the TCJA period for insiders at firms with NOLs.[19] In contrast, we do not find evidence that tax asset revaluation, interest deduction limitation, immediate asset expensing, or the domestic production deduction repeal are associated with differences in insider trading profits.

Overall, Table 11 provides evidence that insiders at multinational firms, firms impacted by the repatriation tax provision, and firms with NOLs made more profitable trades during the TCJA's passage. This evidence is consistent with the market struggling to understand the impact of these provisions relative to firm insiders.

5.6 Consideration of other complex regulation in the 2000s

For reasons discussed earlier, this study uses the TCJA as a setting to examine whether complex regulation creates insider trading opportunities, with a focus on insiders using publicly available information in combination with their firm-specific knowledge to benefit from trading their firm's shares. Although our setting is tax-specific, we expect these results to generalize to other complex regulations. Alternative large scale and complex regulations since 2000 include the Sarbanes-Oxley Act of 2002 ("SOX"), the Dodd-Frank Wall Street Reform and Consumer

[19] In untabulated analyses, we also test for cross-sectional differences associated with total non-recurring tax expense for the TCJA fiscal period, and do not find significant differences. Several distinct TCJA provisions affect non-recurring tax expense, including deemed repatriation of foreign earnings, revaluation of deferred tax assets, and valuation allowances adjustments to reflect NOL deduction changes (Donelson, Koutney, and Mills 2024).

Protection Act of 2010 ("Dodd-Frank"), and the Affordable Care Act (also known as "Obamacare"). Although we expect insider trading to occur alongside all three of these regulations, documenting large scale archival evidence is challenging. In the case of SOX and Dodd-Frank, these regulations occurred after significant market failures (i.e., a wave of frauds in the early 2000s and the financial crisis of 2008), had bipartisan support, and so were openly debated for many months. This extended debate makes it challenging to identify a specific window where all insiders likely traded on information simultaneously in a manner that would be detectable by archival methods.

Obamacare differs in that it was not a bipartisan effort and legislative work escalated very quickly after President Obama's election. Borochin and Golec (2016) perform an event study on Obamacare examining relevant dates around its passage. In untabulated results, we estimate our empirical tests around these dates, comparing the profitability of healthcare managers' insider trades to those of all other managers. We find abnormal profitability among healthcare insiders in March 2009, the month in which President Obama met with industry leaders about healthcare reform (Croft and DeParle 2009). This result captures cases where executives get information about the legislation in advance from government officials, so it differs from our TCJA setting, where executives observe publicly available information, combine it with their firm specific information, and make profitable trades. However, it provides at least some additional large scale archival evidence that complex regulation creates insider trading opportunities.

VI. CONCLUSION

We investigate whether the quick passage of the 2017 Tax Cuts and Jobs Act (TCJA) provided firm insiders with an advantage over external investors. Consistent with insiders having superior capabilities in processing complex information about new regulations, we find evidence

that the TCJA's passage led to greater market uncertainty, increased information asymmetry, and higher insider trading profitability. These profits are more pronounced in firms with less accurate tax expectations and among insiders with a stronger pre-existing understanding of tax law. We also observe that external monitoring can mitigate insider trading profits but do not find that lobbying activity is associated with insider trading profits around the TCJA. In summary, our evidence indicates that the legislative process involved with complex regulations like the TCJA can unintentionally benefit firm insiders.

We caveat our findings by highlighting that we can only examine insider transactions that were made and cannot know which transactions were not executed. For instance, if an insider knows their stock price might increase because of the TCJA, that executive might have no insider sales and, instead, would hold their shares. Holding when they otherwise might have sold these shares represents positive insider trading activity even though no actual transaction occurred. We are not able to capture this activity using publicly available data. Furthermore, we highlight that while we do our best to approximate the insider knowledge window (see Appendix B), it is possible that some insiders knew more than others throughout the TCJA dates. To the extent this occurs, we would only expect it to add noise to our findings and bias us against finding results.

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APPENDIX A

Variable Definitions

Variable Name	Definition
# Jurisdictions	The natural log of one plus the number of foreign jurisdictions disclosed in Exhibit 21.
Abn. Impact	Price impact minus the firm's average price impact in *t-80* to *t-20.* We standardize *Abn. Impact* to mean zero and standard deviation of one for interpretability.
Abn. Impl. Volatility	The 182-day horizon option implied volatility, minus the value in *t-10.* We standardize *Abn. Impl. Volatility* to mean zero and standard deviation of one for interpretability.
Abn. Spread	The percent effective spread minus the firm's average percent effective spread in *t-80* to *t-20.* We standardize *Abn. Spread* to mean zero and standard deviation of one for interpretability.
Analyst Following	The natural log of one plus the number of analysts forecasting for the firm for the fiscal year, as reported in IBES.
Busy EAs	The number of earnings announcements on day *t* by any firm in Compustat Quarterly (based on RDQ).
Cash	Cash scaled by assets (CHE / AT).
CEO Profit	Calculated following *Profit,* except multiplied by negative one for observations with net CEO sales (instead of net insider sales) and set to missing for observations with no CEO transactions.
CFO Profit	Calculated following *Profit,* except multiplied by negative one for observations with net CFO sales (instead of net insider sales) and set to missing for observations with no CFO transactions.
CIO Profit	Calculated following *Profit,* except multiplied by negative one for observations with net CIO sales (instead of net insider sales) and set to missing for observations with no CIO transactions.
COO Profit	Calculated following *Profit,* except multiplied by negative one for observations with net COO sales (instead of net insider sales) and set to missing for observations with no COO transactions.
CTO Profit	Calculated following *Profit,* except multiplied by negative one for observations with net CTO sales (instead of net insider sales) and set to missing for observations with no CTO transactions.
DPAD	An indicator variable equal to one for firms that mention the domestic production activities deduction in their 2016 or 2017 Form 10-K, measured following Campbell et al. (2021).

Appendix A (continued)

Variable Definitions

Variable Name	Definition
DTAs	Deferred taxes for the fiscal year end before the enactment of the TCJA (i.e., most recent with DATADATE less than December 31, 2017), scaled by assets (TXDB / AT). We replace missing values of deferred taxes with zero.
Equity Invst.	Equity method investments scaled by assets (IVAEQ / AT).
GC Profit	Calculated following *Profit,* except multiplied by negative one for observations with net GC sales (General Counsel trades, instead of net insider sales) and set to missing for observations with no GC transactions.
Institutional Owners	The number of 13-F institutional owners in WRDS Thomson Reuters Institutional Holdings data (NUMINSTOWNERS).
Interest Limit	An indicator variable equal to one for observations with interest expense greater than interest income plus 30% of EBITDA, and zero otherwise ((XINT) > (IDIT + 0.3 × EBITDA)). We replace missing values of interest income with zero.
Litigation Risk	The fitted probability of litigation, estimated using the coefficients from Kim and Skinner's (2012) Table 7, Column 3.
LnMVE	The natural log of market value of equity, calculated as the share price times shares outstanding in the CRSP daily file (ln(PRC × SHROUT)).
Lobby01	An indicator variable equal to one for observations with non-zero amounts in lobbying reports for the fourth quarter of 2017 in Kim's (2018) data, and zero otherwise.
Lobby_Tax01	An indicator variable equal to one for observations with non-zero amounts in lobbying reports for the fourth quarter of 2017 related to tax in Kim's (2018) data, and zero otherwise. We classify reports as related to tax if the issues include taxes or the IRS (*general_issue_code* includes "TAX" or *government_entity_ids* include "188")).
Lobby_TCJA01	An indicator variable equal to one for observations with non-zero amounts in lobbying reports for the fourth quarter of 2017 related to the TCJA in Kim's (2018) data, and zero otherwise. We classify reports as related to the TCJA if the issue text references the TCJA (*bill_id_agg* includes "hr1-115").
Media Coverage	The number of media articles and news flashes about the firm (NEWS_TYPE equals "FULL-ARTICLE", "HOT-NEWS-FLASH", or "NEWS-FLASH") reported during the fiscal year, from RavenPack Analytics.

Appendix A (continued)

Variable Definitions

Variable Name	Definition
Monitor	A placeholder variable that takes the value of the variable indicated in the table header. When continuous, we standardize *Monitor* to mean zero and standard deviation of one for interpretability.
MTB	Market-to-book ratio (((PRC × SHROUT) / AT) /1000).
Multinational	An indicator variable equal to one for observations with foreign pretax income greater than zero (PIFO > 0), and zero otherwise.
NOL	An indicator variable equal to one if a firm had an NOL (TLCF > 0) at the beginning of the year, and zero otherwise.
Placebo	An indicator variable equal to one for observations from November 2 to December 22 (inclusive) during any calendar year *except* 2017, and zero otherwise.
PPE	Gross plant, property, and equipment scaled by beginning assets ($PPEGT / AT_{t-1}$).
Prior Qtr Ret	The buy-and-hold return over the prior fiscal quarter.
PRE	Indefinitely reinvested foreign earnings, from Audit Analytics' Tax Footnotes database, set to zero if missing in Audit Analytics.
Profit	The 30-day buy-and-hold return for the firm less the 30-day buy-and-hold return on a value-weighted portfolio of firms matched on size, book-to-market ratio, and momentum (Daniel et al. 1997). *Profit* is multiplied by negative one for observations with net insider sales and set to missing for observations with no insider transactions. We multiply returns by 100 for convenience. We only consider open market purchases and sales (TRANCODE equals P or S) of ordinary and common stock (SECTITLE equals ORD or COM) by insiders with the following titles in TR Insiders data: CEO, CFO, CIO, COO, CTO, president, executive or senior vice president, or general counsel (ROLECODE equals CEO, CFO, CO, CT, CI, P, EVP, SVP, or GC).
Provis	A placeholder variable that takes the value of the variable indicated in the table header. When continuous, we standardize *Provis* to mean zero and standard deviation of one for interpretability.
Recent EA	An indicator variable equal to one for observations where the firm released an earnings announcement in the prior two weeks, and zero otherwise.
Recent Short Volume	Total short volume scaled by shares outstanding, averaged over the days *t-80* to *t-20*.
ROA	Pretax income scaled by assets (PI / AT).
Size	Assets (AT).

Appendix A (continued)

Variable Definitions

Variable Name	Definition
Tax AFD	A placeholder variable that takes the value of the variable in the table header, standardized to mean zero and standard deviation of one.
Tax AFD Std. Dev.	The standard deviation of implied ETR forecasts for the fiscal quarter containing December 22, 2017 issued during the window from November 2, 2017 to December 22, 2017 observed in the IBES detail file. Implied ETR forecast equals the difference between the forecasts for pretax income and net income issued by the same analyst on the same day, scaled by the forecast for pretax income. We use the latest implied ETR forecast during this window for each firm-analyst, and require forecasts from at least two analysts.
Tax AFD Variance	The variance of implied ETR forecasts. Implied ETR forecasts are calculated as described in the definition for *Tax AFD Std. Dev.*
Tax AFD IQR	The interquartile range of implied ETR forecasts. Implied ETR forecasts are calculated as described in the definition for *Tax AFD Std. Dev.*
Tax AFD Range	The total range (the maximum minus the minimum) of implied ETR forecasts. Implied ETR forecasts are calculated as described in the definition for *Tax AFD Std. Dev.*
TCJA	An indicator variable equal to one for observations with dates within November 2, 2017, to December 22, 2017, inclusive, and zero otherwise.
Trade Size - # Shares	The absolute number of shares traded by insiders in TR Insiders data (SHARES), set to missing if *Transaction01* equals zero.
Trade Size - % Shares	The absolute number of shares traded by insiders in TR Insiders data scaled by number of shares outstanding reported in CRSP (SHARES / SHROUT), set to missing if *Transaction01* equals zero.
Trade Size - Dollars ($)	The total absolute dollar value of trades by insiders reported in TR Insiders data (SHARES × TPRICE), set to missing if *Transaction01* equals zero.
Transaction01	An indicator variable equal to one for observations with any insider transaction, and zero otherwise. We only consider open market purchases and sales (TRANCODE equals P or S) of ordinary and common stock (SECTITLE equals ORD or COM) by insiders with insiders with the following titles in TR Insiders data: CEO, CFO, CIO, COO, CTO, president, executive or senior vice president, or general counsel (ROLECODE equals CEO, CFO, CO, CT, CI, P, EVP, SVP, or GC).

Variable names refer to Compustat variables unless the definition references another source.

APPENDIX B

Legislative History of the TCJA

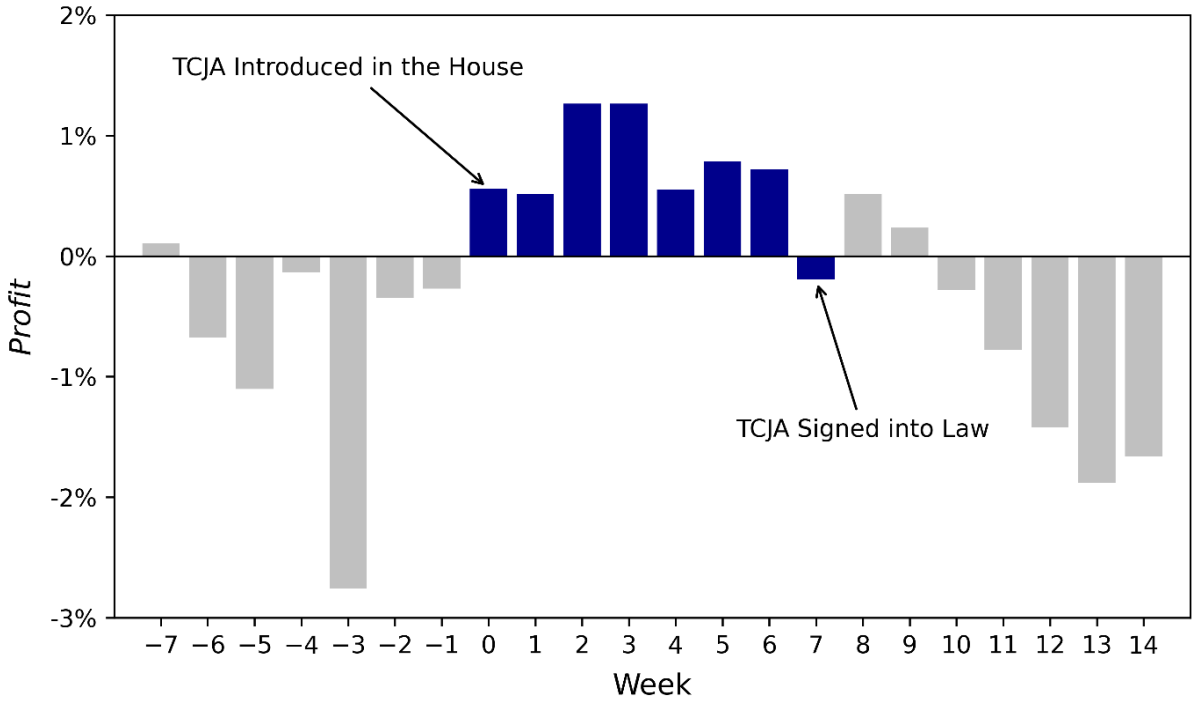
The table below lists the legislative events leading to the passage of the TCJA by date. The GHW column indicates major event dates on which Gaertner et al. (2019) find significant increases in Google searches for information about tax reform. The KPTT column indicates major events to which Kalcheva et al. (2020) find significant U.S. stock market reactions.

Event Date		GHW	KPTT	Event description
We	9/27	X	X	President Trump and Congressional Republicans release a "Unified Framework" that lays out the main tax reform objectives.
Th	10/5			House passes a budget that includes a preliminary provision to be fulfilled by tax reform.
Th	10/19			In the evening, the Senate passes a budget that includes a preliminary provision to be fulfilled by tax reform.
Th	10/26			House adopts and passes the Senate budget, allowing Congress to formally begin debate on tax reform as part of the budget reconciliation process.
Th	11/2	X	X	Formal introduction of the TCJA into the House.
Mo	11/6			House Ways and Means Committee begins marking up the bill, lasting until 11/9.
Th	11/9			Bill introduced in the Senate with significant differences relative to House version. The House Ways and Means Committee advances bill for a vote in the full House.
Mo	11/13			Senate Finance Committee begins marking up the bill, lasting until 11/16.
Th	11/16	X	X	House votes and passes the bill.
Fr	11/17			Senate Finance Committee advances the bill to the Senate Budget Committee.
Tu	11/28		X	Senate Budget Committee approves and advancing bill for a vote in the full Senate.
We	11/29		X	In the evening, Senate passes motion to begin final vote on the bill.
Th	11/30			Senator John McCain expresses support for the bill.
Sa	12/2	X	X	Senate passes the bill.
Mo	12/4			House votes to bring the bill to conference committee, which begins final reconciliation process and final negotiations.
We	12/6			Senate votes to bring the bill to conference committee and begin reconciliation.
Th	12/14			Senator Marco Rubio voices objections to the bill.
Fr	12/15	X	X	Conference Committee finishes reconciliation of House and Senate bills, including accommodations for certain Senate Republicans.
Tu	12/19			House passes the reconciled bill.
We	12/20	X		Senate passes the reconciled bill.
Fr	12/22			President Trump signs the TCJA into law.

Figure 1

Insider Trading Profitability Around the TCJA

Panel A: Mean Profitability



Panel B: Median and Interquartile Range of Profitability

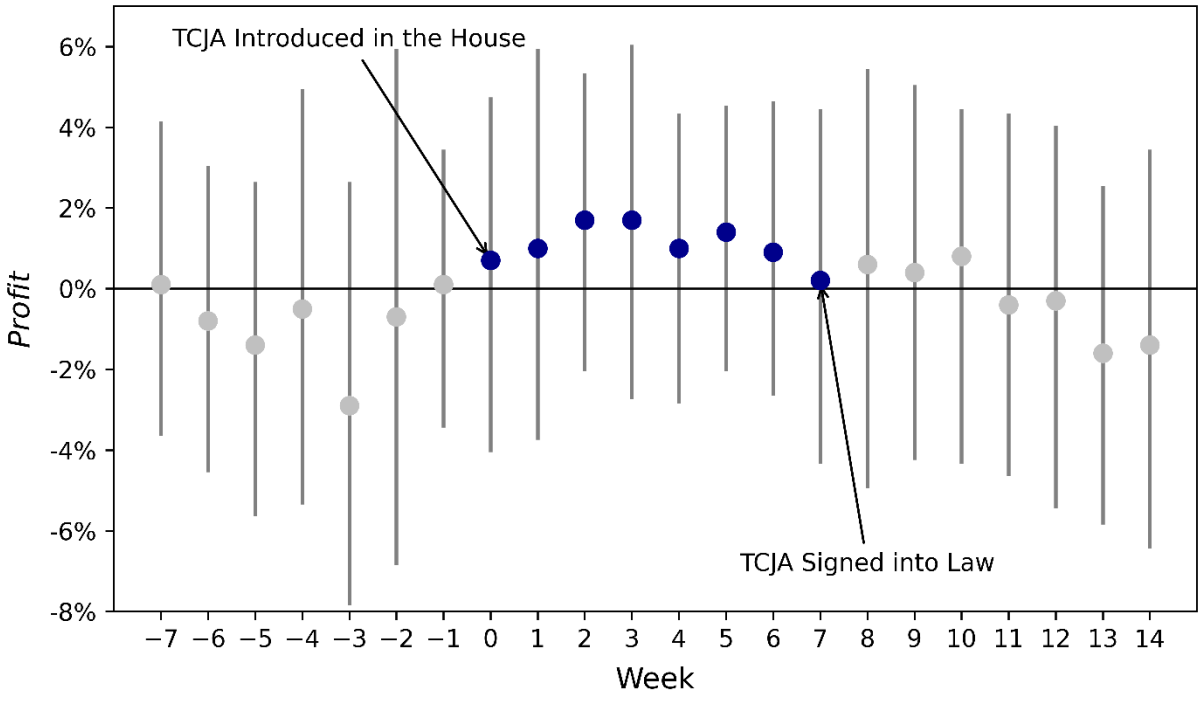


Figure 1 (continued)

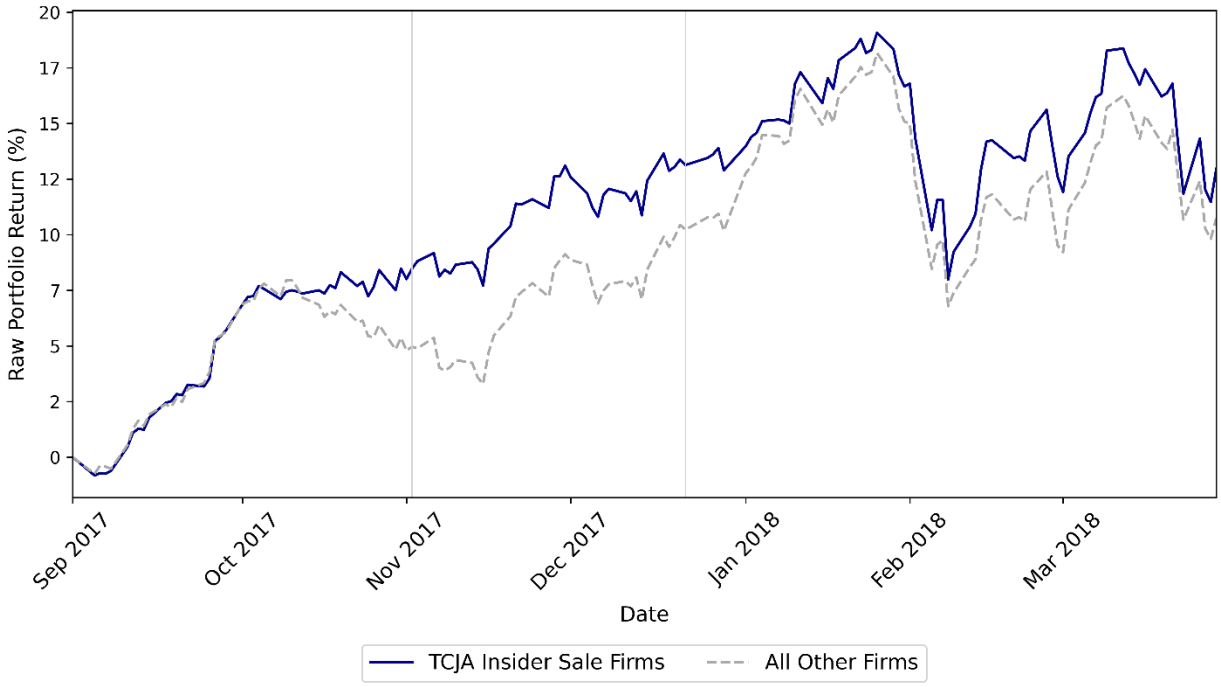
Insider Trading Profitability Around the TCJA

This figure plots the profitability of insider trades in the weeks around the passage of the TCJA. Panel A plots the mean value of *Profit* for each week. Panel B plots profitability for the two interquartiles (Q2 and Q3) for each week: the dots plot the median value of *Profit*, and the surrounding bars denote the ranges of the second and third quartiles of *Profit*. We group days into calendar weeks, and we denote as Week 0 the week from October 30th to November 3rd of 2017, during which the TCJA was introduced in the U.S. House of Representatives.

Figure 2

Stock Returns Around the TCJA

Panel A: Firms Traded During TCJA Passage



Panel B: Firms Traded Profitably During TCJA Passage

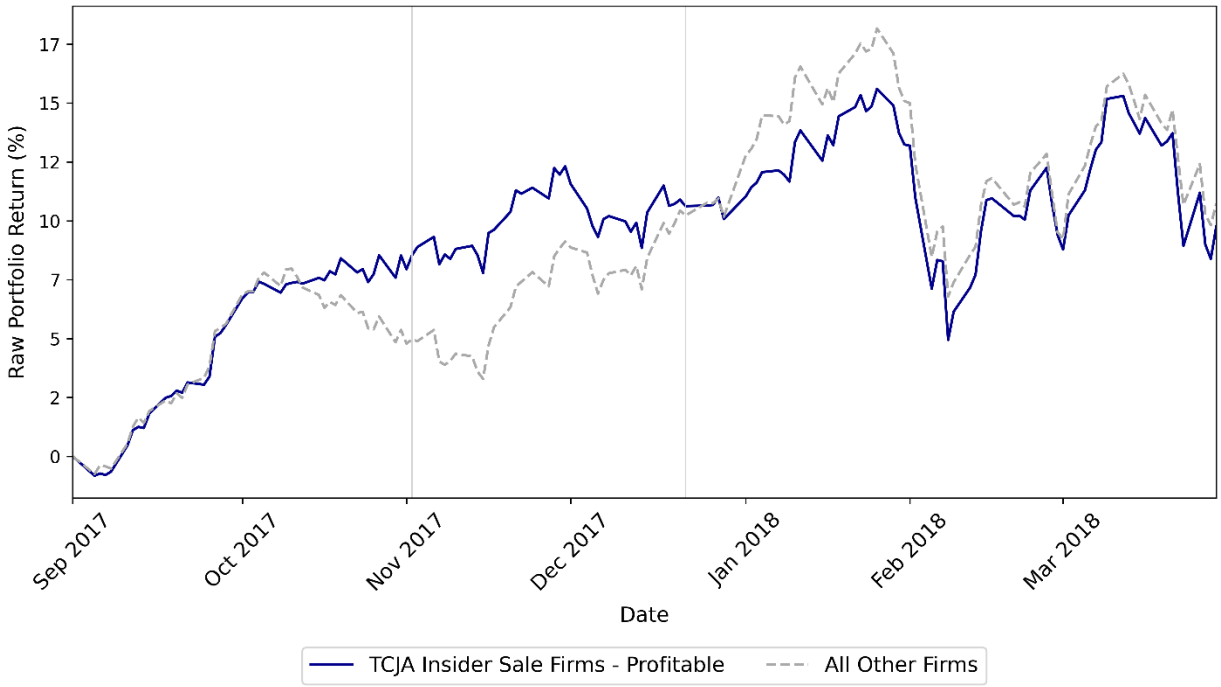


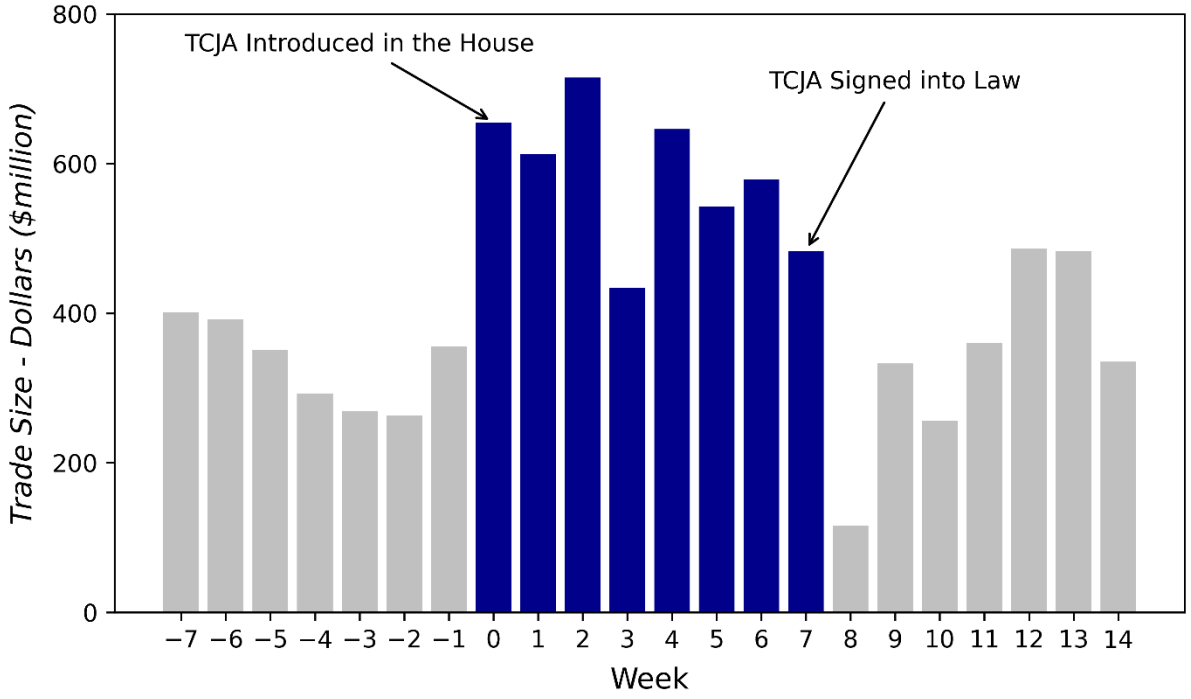
Figure 2 (continued)

Stock Returns Around the TCJA

This figure plots returns to firms traded by insiders during the TCJA's passage relative to other firms in our sample. In Panel A, the solid blue series plots returns for firms sold by insiders during TCJA passage. In Panel B, the solid blue series plots the returns to firms sold profitably (*Profit* greater than zero) by insiders during TCJA passage. In both panels, the dashed silver series plots returns for all firms not traded by insiders during TCJA passage. Returns are measured as the cumulative raw buy-and-hold return to an equal-weighted portfolio purchased on September 1, 2017. Vertical lines mark the TCJA's legislative introduction on November 2, 2017, and its signature on December 22, 2017.

Figure 3

Insider Trading Volume Around the TCJA



This figure plots the mean volume of insider trades in the weeks around the passage of the TCJA. The y-axis measures volume using the variable *Trade Size - Dollars ($)* from our tests. We group days into calendar weeks, and we denote as Week 0 the week from October 30th to November 3rd of 2017, during which the TCJA was introduced in the U.S. House of Representatives.

Table 1

Sample Selection

	Observations	Firms
Purchases or sales of common stock by CEOs, CFOs, CIOs, COOs, CTOs, presidents, executive vice presidents, senior vice presidents, and general counsels during 2017 and 2018	41,664	3,894
Require CUSIP match to CRSP daily stock file	(4,247)	(526)
Require PERMNO match to Compustat	(240)	(36)
Require non-missing data for 30-day returns and control variables	(1,271)	(180)
Test sample	35,906	3,152

This table summarizes the sample selection process and results.

Table 2

Descriptive Statistics

Panel A: Summary statistics

Variable	N	mean	sd	p25	p50	p75
Profit	35,906	0.129	8.856	-4.249	0.202	4.666
TCJA	35,906	0.095	0.294	0.000	0.000	0.000
LnMVE	35,906	14.598	1.973	13.336	14.616	15.844
MTB	35,906	1.989	2.007	0.569	1.322	2.791
ROA	35,906	0.000	0.191	-0.010	0.030	0.087
Prior Qtr Ret	35,906	0.023	0.132	-0.034	0.021	0.076
Recent EA	35,906	0.074	0.263	0.000	0.000	0.000
Busy EAs	35,906	136.484	144.518	32.000	75.000	192.000

Panel B: Partitioned by tax reform indicator

	TCJA = 0						*TCJA* = 1			
Variable	N	mean	(t)	SD	p50	(z)	N	mean	SD	p50
Profit	32,478	0.050	***	8.903	0.129	***	3,428	0.882	8.371	0.913
LnMVE	32,478	14.607	***	1.975	14.618	***	3,428	14.507	1.956	14.603
MTB	32,478	1.993		2.009	1.327	***	3,428	1.954	1.993	1.281
ROA	32,478	0.000		0.191	0.030	***	3,428	0.002	0.188	0.029
Prior Qtr Ret	32,478	0.023	*	0.133	0.022	***	3,428	0.027	0.124	0.020
Recent EA	32,478	0.079	***	0.270	0.000	***	3,428	0.032	0.175	0.000
Busy EAs	32,478	135.90	**	141.55	76.00	***	3,428	142.00	170.03	59.00

Panel C: Correlations

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	*Profit*		**0.032**	**-0.041**	**-0.058**	**-0.018**	**-0.028**	-0.010	**-0.029**
(2)	*TCJA*	**0.028**		**-0.012**	-0.006	-0.001	0.008	**-0.053**	**-0.014**
(3)	*LnMVE*	**-0.035**	**-0.015**		**0.277**	**0.397**	**0.131**	0.009	**0.046**
(4)	*MTB*	**-0.037**	-0.006	**0.201**		**0.134**	**0.194**	**0.071**	**-0.056**
(5)	*ROA*	**-0.028**	0.003	**0.362**	**-0.160**		**0.094**	**-0.024**	**0.053**
(6)	*Prior Qtr Ret*	**-0.039**	0.009	**0.090**	**0.167**	**0.036**		-0.005	-0.008
(7)	*Recent EA*	**-0.014**	**-0.053**	**0.013**	**0.054**	**-0.027**	-0.005		**0.173**
(8)	*Busy EAs*	**-0.025**	**0.012**	**0.041**	**-0.025**	**0.055**	**-0.014**	**0.142**	

Table 2 (continued)

Descriptive statistics

This table provides descriptive statistics for the variables used in my primary tests. Panel A presents summary statistics for the entire sample. Panel B presents statistics partitioned by values of *TCJA*. ***, **, and * in Panel B denote statistical significance at the 1%, 5%, and 10% levels of t-tests and Wilcoxon rank-sum tests comparing the partitioned subsamples. Panel C presents Pearson (Spearman) correlation coefficients for equation 2 variables in the lower (upper) triangle, with significant correlations (at p-value < 0.05) in bold. We winsorize variables at the 1st and 99th percentiles. Appendix A provides variable definitions.

Table 3

Capital Market Uncertainty During TCJA Passage

Dep. variable:	*Abn. Impl. Volatility*	*Abn. Spread*	*Abn. Impact*
	(1)	(2)	(3)
TCJA	0.0557***	0.0269**	0.0400***
	(7.54)	(2.47)	(5.08)
LnMVE	-0.0012	0.0301***	0.0261***
	(-0.88)	(10.11)	(10.72)
MTB	0.0035**	-0.0011	-0.0020
	(2.28)	(-0.45)	(-1.19)
ROA	-0.0130	-0.0018	-0.0008
	(-0.78)	(-0.07)	(-0.04)
Prior Qtr Ret	-0.9880***	-0.9975***	-0.5350***
	(-23.66)	(-26.17)	(-15.88)
Recent EA	0.0576***	0.0320***	0.0153***
	(8.90)	(8.68)	(4.70)
Busy EAs	-0.0005***	0.0000***	0.0001***
	(-29.33)	(3.44)	(9.21)
Fixed Effects	Industry	Industry	Industry
Observations	380,156	1,198,287	1,197,940
Adj. R-squared	0.016	0.021	0.008

This table presents OLS estimates of capital market uncertainty during passage of tax reform. The dependent variables in Columns 1 through 3 measure implied option volatility (*Abn. Impl. Volatility*), information asymmetry (*Abn. Spread*), or price impact (*Abn. Impact*), respectively. We standardize each dependent variable to mean zero and standard deviation of one. The independent variable *TCJA* is an indicator variable equal to one for observations during the passage of tax reform (November 2, 2017 through December 22, 2017), and zero otherwise. For these tests, we include observations with zero insider trading and require data for dependent variables.

Appendix A provides complete variable definitions. We use Fama-French 48 classifications to define industry fixed effects. We winsorize variables at the 1st and 99th percentiles. T-statistics based on robust standard errors clustered by firm appear in parentheses below the coefficients. ***, **, and * next to the coefficients denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4

Insider Trading Returns During TCJA Passage

Transactions:	All Transactions		Purchases		Sales	
Dep. variable:	*Profit*	*Profit*	*Profit*	*Profit*	*Profit*	*Profit*
	(1)	(2)	(3)	(4)	(5)	(6)
TCJA	0.7811***	0.7827***	-0.5448	-0.5008	1.0236***	1.0196***
	(3.00)	(3.05)	(-0.73)	(-0.68)	(3.78)	(3.80)
LnMVE		-0.0568		-0.2498*		0.0630
		(-1.19)		(-1.78)		(1.22)
MTB		-0.0179		0.0298		0.0237
		(-0.33)		(0.08)		(0.46)
ROA		-1.3306*		3.1810*		-2.1634***
		(-1.74)		(1.93)		(-2.62)
Prior Qtr Ret		-2.2042***		-1.9293		-1.9113**
		(-2.64)		(-0.88)		(-2.11)
Recent EA		-0.1089		0.3892		-0.1127
		(-0.30)		(0.42)		(-0.29)
Busy EAs		-0.0016***		-0.0017		-0.0016***
		(-4.07)		(-1.51)		(-3.70)
Controls	No	Yes	No	Yes	No	Yes
Fixed Effects	Industry	Industry	Industry	Industry	Industry	Industry
Observations	35,906	35,906	6,206	6,206	29,699	29,699
Adj. R-squared	0.010	0.013	0.014	0.017	0.012	0.015

This table presents OLS estimates of insider trading profitability during passage of tax reform. The dependent variable *Profit* equals the buy-and-hold return over the 30 days following an insider trade, multiplied by negative one (not multiplied) for observations with net insider sales (purchases). The independent variable *TCJA* is an indicator variable equal to one for observations during the passage of tax reform (November 2, 2017 through December 22, 2017), and zero otherwise.

Appendix A provides complete variable definitions. We use Fama-French 48 classifications to define industry fixed effects. We winsorize variables at the 1st and 99th percentiles. T-statistics based on robust standard errors clustered by firm appear in parentheses below the coefficients. ***, **, and * next to the coefficients denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5

Robustness Tests

Panel A: Alternative fixed effects structures

Dep. variable:	*Profit* (1)	*Profit* (2)	*Profit* (3)	*Profit* (4)
TCJA	0.6722**	0.7995***	0.7757***	0.6701**
	(2.40)	(3.18)	(3.02)	(2.40)
Controls	Yes	Yes	Yes	Yes
Fixed Effects	Firm	Weekday	Industry, weekday	Firm, weekday
Observations	35,536	35,906	35,906	35,536
Adj. R-squared	0.151	0.005	0.013	0.151

Table 5 (continued)

Robustness Tests

Panel B: Alternative sample periods

Sample length:	2 years [for comparison]	4 months	6 months	1 year	6 years
Sample start:	Jan 2017	Oct 2017	Sept 2017	July 2017	Jan 2015
Sample end:	Dec 2018	Jan 2018	Feb 2018	June 2018	Dec 2020
Dep. variable:	*Profit*	*Profit*	*Profit*	*Profit*	*Profit*
	(1)	(2)	(3)	(4)	(5)
TCJA	0.7827***	1.2495***	1.2103***	0.8649***	0.5924**
	(3.05)	(3.19)	(3.66)	(2.94)	(2.42)
LnMVE	-0.0568	-0.3075**	-0.2659**	-0.0833	-0.1267***
	(-1.19)	(-2.48)	(-2.48)	(-1.15)	(-3.13)
MTB	-0.0179	-0.0239	0.0481	-0.0133	-0.0398
	(-0.33)	(-0.16)	(0.38)	(-0.16)	(-0.84)
ROA	-1.3306*	0.2883	0.1207	-2.0249**	-1.8029***
	(-1.74)	(0.17)	(0.10)	(-2.04)	(-3.37)
Prior Qtr Ret	-2.2042***	-0.5237	-1.5301	-1.9416	0.4921
	(-2.64)	(-0.18)	(-0.74)	(-1.57)	(0.97)
Recent EA	-0.1089	-0.2275	-0.7152	-0.8843	-0.0520
	(-0.30)	(-0.25)	(-0.88)	(-1.61)	(-0.23)
Busy EAs	-0.0016***	0.0008	-0.0005	-0.0002	-0.0004
	(-4.07)	(0.85)	(-0.55)	(-0.39)	(-1.48)
Fixed Effects	Industry	Industry	Industry	Industry	Industry
Observations	35,906	5,962	8,901	18,305	106,884
Adjusted R-squared	0.013	0.017	0.015	0.013	0.006

This table presents OLS estimates of insider trading profitability during passage of tax reform using alternative design specifications. Panel A presents estimates of our main test using alternate fixed effect structures. We omit firm-singleton observations in specifications with firm fixed effects (Correia 2015). Panel B presents estimates from alternative sample windows. Column 1 presents the estimates from Table 4, Column 2 for comparison. Columns 2 through 5 present estimates using sample periods of varying lengths centered around the passage of tax reform. In both panels, the dependent variable *Profit* equals the buy-and-hold return over the 30 days following an insider trade, multiplied by negative one for observations with net insider sales. The independent variable *TCJA* is an indicator variable equal to one for observations during the passage of tax reform (November 2, 2017 through December 22, 2017), and zero otherwise.

Appendix A provides complete variable definitions. We use Fama-French 48 classifications to define industry fixed effects. We winsorize variables at the 1st and 99th percentiles. T-statistics based on robust standard errors clustered by firm appear in parentheses below the coefficients. ***, **, and * next to the coefficients denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6

Placebo Tests

Design:	Shift back one year	Shift forward one year	Avg. in adjacent years
Sample period:	2016-2017	2018-2019	2015-2020
Dep. variable:	*Profit*	*Profit*	*Profit*
	(1)	(2)	(3)
Placebo	0.2564	-0.1803	-0.1309
	(0.98)	(-0.55)	(-0.84)
LnMVE	-0.1123***	-0.0267	-0.1276***
	(-2.61)	(-0.43)	(-3.15)
MTB	0.1382**	-0.0566	-0.0389
	(2.25)	(-0.87)	(-0.82)
ROA	-1.2430*	-3.4447***	-1.8068***
	(-1.81)	(-3.58)	(-3.38)
Prior Qtr Ret	-0.5163	-0.5164	0.5065
	(-0.54)	(-0.60)	(1.00)
Recent EA	-0.2995	-0.6091*	-0.0754
	(-0.95)	(-1.67)	(-0.34)
Busy EAs	-0.0002	-0.0021***	-0.0004
	(-0.61)	(-4.53)	(-1.39)
Fixed Effects	Industry	Industry	Industry
Observations	35,130	34,594	106,884
Adjusted R-squared	0.007	0.015	0.006

This table presents placebo tests of insider trading profitability during calendar periods parallel to the 2017 tax reform period. Column 1 presents estimates after moving our primary test design backwards one year, with the indicator variable *Placebo* equal to one for observations during November 2, 2016 to December 22, 2016. Column 2 presents estimates after moving our primary test design forwards one year, with the indicator variable *Placebo* equal to one for observations during November 2, 2018 to December 22, 2018. Column 3 presents estimates using a sample period including the years 2015 through 2020, with the indicator variable *Placebo* equal to one for observations during November 2 to December 22 of any year *except* 2017. In all columns, the dependent variable *Profit* equals the buy-and-hold return over the 30 days following an insider trade, multiplied by negative one for observations with net insider sales.

Appendix A provides complete variable definitions. We use Fama-French 48 classifications to define industry fixed effects. We winsorize variables at the 1st and 99th percentiles. T-statistics based on robust standard errors clustered by firm appear in parentheses below the coefficients. ***, **, and * next to the coefficients denote two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table 7

Insider Trading Volume During TCJA Passage

Panel A: Univariate

	TCJA = 0			*TCJA* = 1					
		(1)			(2)		T-test : (2) - (1)		
Variable	N	mean	p50	N	mean	p50	(t)	P-value	
Transaction01	1,311,781	0.05	0.00	104,339	0.06	0.00	3.35	0.00	***
Trade Size - # Shares	32,478	22,833	8,246	3,428	24,051	8,112	1.50	0.13	
Trade Size - Dollars ($)	32,478	1,218,873	287,681	3,428	1,235,849	288,491	0.32	0.75	
Trade Size - % Shares Outstanding	32,478	0.034%	0.013%	3,428	0.036%	0.014%	2.00	0.05	**

Table 7 (continued)

Insider Trading Volume During TCJA Passage

Panel B: Regressions

Dep. variable:	*Transaction01* (1)	*Trade Size - # Shares* (2)	*Trade Size - Dollars ($)* (3)	*Trade Size - % Shares* (4)
TCJA	0.0009	1.2945	54.3040	0.0087
	(0.28)	(0.80)	(0.68)	(0.62)
LnMVE	0.0113***	4.2576***	533.8412***	-0.0891***
	(4.56)	(5.18)	(6.47)	(-18.25)
MTB	0.0107***	-0.3448	118.2983***	0.0165***
	(4.37)	(-0.68)	(2.67)	(2.99)
ROA	0.0118	-8.8790*	503.3208	0.0522
	(1.14)	(-1.77)	(1.12)	(0.99)
Prior Qtr Ret	0.0477***	6.6102	-41.7918	0.3010***
	(3.95)	(1.33)	(-0.09)	(5.67)
Recent EA	-0.040***	-3.687***	-274.474***	-0.0445***
	(-15.66)	(-3.67)	(-4.60)	(-3.22)
Busy EAs	0.0001***	0.0045**	0.2218*	0.0001***
	(9.86)	(2.25)	(1.67)	(3.55)
Fixed Effects	Industry	Industry	Industry	Industry
Observations	1,416,120	35,906	35,906	35,906
Adj. R-squared	0.003	0.051	0.163	0.097

This table presents results from examining insider trading volume during passage of tax reform. Insider trading volume is measured as insider trade incidence (*Transaction01*), the number of shares traded (*Trade Size - # Shares*), the dollar value of shares traded (*Trade Size - Dollars ($)*), or the number of shares traded as a percent of total outstanding shares (*Trade Size - % Shares*). The variable *Transaction01* includes observations with zero insider trading. Panel A presents univariate comparisons of volume during and outside of tax reform passage. Panel B presents estimates from OLS regressions of volume on control variables and the indicator variable *TCJA,* which equals one for observations during the passage of tax reform (November 2, 2017 through December 22, 2017), and zero otherwise. We scale *Trade Size - # Shares* and *Trade Size - Dollars ($)* by 1,000 in Panel B for convenience.

Appendix A provides complete variable definitions. We use Fama-French 48 classifications to define industry fixed effects. We winsorize variables at the 1st and 99th percentiles. T-statistics based on robust standard errors clustered by firm appear in parentheses below the coefficients. ***, **, and * next to the coefficients denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8

Analyst Tax Forecast Dispersion and Returns to Insider Trades

Tax AFD variable:	*Tax AFD Std. Dev.*	*Tax AFD Variance*	*Tax AFD IQR*	*Tax AFD Range*
Dep. variable:	*Profit*	*Profit*	*Profit*	*Profit*
	(1)	(2)	(3)	(4)
TCJA × Tax AFD	0.6877***	0.7196***	0.6403***	0.6490**
	(3.71)	(9.23)	(3.83)	(2.05)
TCJA	0.5067	0.5037	0.5005	0.5111
	(1.33)	(1.32)	(1.31)	(1.33)
Tax AFD	-0.4062***	-0.3934***	-0.3133**	-0.4273***
	(-5.18)	(-6.59)	(-2.45)	(-4.65)
Controls	Yes	Yes	Yes	Yes
Fixed Effects	Industry	Industry	Industry	Industry
Observations	18,077	18,077	18,077	18,077
Adj. R-squared	0.020	0.020	0.019	0.020

This table presents OLS estimates of how insider trading profitability during passage of tax reform varies with implied analyst tax forecast dispersion. In each column the placeholder variable *AFD* equals the measure of implied analyst tax forecast dispersion indicated in the column header: either the standard deviation, variance, interquartile range, or total range of implied analyst ETR forecasts for the fiscal quarter containing December 22, 2017 and issued during the passage of tax reform (November 2, 2017 through December 22, 2017). We standardize each measure *Tax AFD* to mean of zero and standard deviation of one. We require at least two analysts to provide implied ETR forecasts during the TCJA period, which decreases our sample size relative to our main tests. The independent variable *TCJA* is an indicator variable equal to one for observations during the passage of tax reform, and zero otherwise. The dependent variable *Profit* equals the buy-and-hold return over the 30 days following an insider trade, multiplied by negative one for observations with net insider sales.

Appendix A provides complete variable definitions. We use Fama-French 48 classifications to define industry fixed effects. We winsorize variables at the 1st and 99th percentiles. T-statistics based on robust standard errors clustered by firm appear in parentheses below the coefficients. ***, **, and * next to the coefficients denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9

Insider Ability to Understand Tax Law and Returns to Insider Trades

Dep. variable:	*Profit*	*CEO Profit*	*CFO Profit*	*COO Profit*	*CIO Profit*	*CTO Profit*	*GC Profit*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TCJA	0.7827***	0.5273	1.6268***	0.4672	5.7336	2.0492	1.7452***
	(3.05)	(1.37)	(3.53)	(0.55)	(1.40)	(1.27)	(3.44)
LnMVE	-0.0568	-0.1431*	-0.0159	-0.0234	-2.9271***	-0.2237	0.0724
	(-1.19)	(-1.85)	(-0.16)	(-0.22)	(-3.13)	(-0.78)	(0.58)
MTB	-0.0179	0.0379	-0.0754	-0.1209	-0.5499	0.2613*	0.0011
	(-0.33)	(0.45)	(-0.77)	(-0.78)	(-0.74)	(1.69)	(0.01)
ROA	-1.3306*	-0.0709	-1.2457	0.2768	37.2742**	0.8215	-4.5725***
	(-1.74)	(-0.08)	(-1.12)	(0.16)	(2.21)	(0.36)	(-2.68)
Prior Qtr Ret	-2.2042***	-1.8534	-0.8416	-3.7657*	9.8860	-2.1290	-2.1278
	(-2.64)	(-1.27)	(-0.56)	(-1.77)	(1.43)	(-0.63)	(-1.38)
Recent EA	-0.1089	-0.0478	-0.6719	-1.1572	1.9377	-0.9879	0.3602
	(-0.30)	(-0.09)	(-1.03)	(-1.02)	(0.54)	(-0.67)	(0.51)
Busy EAs	-0.0016***	-0.0011*	-0.0031***	-0.0018*	-0.0087*	-0.0035*	-0.0025***
	(-4.07)	(-1.68)	(-3.80)	(-1.69)	(-1.88)	(-1.68)	(-2.73)
Coefficient test vs. Column 1:							
χ^2		1.074	4.978**	0.163	1.611	0.682	4.141**
Fixed Effects	Industry	Industry	Industry	Industry	Industry	Industry	Industry
Observations	35,906	16,220	8,101	3,421	233	1,833	4,199
Adjusted R-squared	0.013	0.015	0.011	0.022	0.241	0.029	0.027

This table presents OLS estimates of how insider trading profitability during passage of tax reform varies by insider title. The dependent variable *Profit* equals the buy-and-hold return over the 30 days following an insider trade, multiplied by negative one (not multiplied) for observations with net insider sales (purchases). Column 1 presents the estimates from Table 4, Column 2 for comparison. Columns 2 through 7 redefine *Profit,* restricting insider trades to those by insiders with the specific title indicated in the table header. The independent variable *TCJA* is an indicator variable equal to one for observations during the passage of tax reform (November 2, 2017 through December 22, 2017), and zero otherwise.

Appendix A provides complete variable definitions. We use Fama-French 48 classifications to define industry fixed effects. We winsorize variables at the 1st and 99th percentiles. T-statistics based on robust standard errors clustered by firm appear in parentheses below the coefficients. ***, **, and * next to the coefficients denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10

External Constraints and Returns to Insider Trades

Variable CS:	*Size*	*Analyst Following*	*Media Coverage*	*Institutional Owners*	*Short Volume*	*Litigation Risk*
Dep. variable:	*Profit*	*Profit*	*Profit*	*Profit*	*Profit*	*Profit*
	(1)	(2)	(3)	(4)	(5)	(6)
TCJA × *Constraint*	-0.4335***	-0.4503*	-0.3277**	-0.0011*	-0.4821	-0.4875**
	(-2.89)	(-1.82)	(-2.09)	(-1.96)	(-1.39)	(-1.99)
TCJA	0.7757***	0.6915***	0.8423***	1.1227***	0.7883***	0.7644***
	(3.04)	(2.71)	(3.30)	(3.04)	(2.94)	(3.08)
CS	0.1278	-0.2218	0.0784	0.0009**	-0.0259	0.0884
	(1.57)	(-1.54)	(0.74)	(2.29)	(-0.19)	(0.52)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Industry	Industry	Industry	Industry	Industry	Industry
Observations	35,906	35,364	34,506	31,244	31,285	21,058
Adj. R-squared	0.014	0.015	0.014	0.013	0.012	0.007

This table presents OLS estimates of how insider trading profitability during passage of tax reform varies with external constraints. In each column, the placeholder variable *Constraint* equals one proxy for external constraints. The observations in each column are restricted to those with non-missing data for *Constraint*. When continuous, we standardize *Constraint* to mean zero and standard deviation of one for interpretability. The independent variable *TCJA* is an indicator variable equal to one for observations during the passage of tax reform (November 2, 2017 through December 22, 2017), and zero otherwise. The dependent variable *Profit* equals the buy-and-hold return over the 30 days following an insider trade, multiplied by negative one for observations with net insider sales.

Appendix A provides complete variable definitions. We use Fama-French 48 classifications to define industry fixed effects. We winsorize variables at the 1st and 99th percentiles. T-statistics based on robust standard errors clustered by firm appear in parentheses below the coefficients. ***, **, and * next to the coefficients denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 11

Tax Reform Provisions and Returns to Insider Trades

Panel A: Multinational and repatriation effects

Variable *Provis*:	*Multinational*	*# Jurisdictions*	*Equity Invst.*	*PRE*	*Cash*
Dep. variable:	*Profit*	*Profit*	*Profit*	*Profit*	*Profit*
	(1)	(2)	(3)	(4)	(5)
TCJA × Provis	1.9895***	0.6693***	0.3338	0.5632**	0.8532**
	(3.86)	(2.98)	(1.61)	(2.30)	(2.40)
TCJA	-0.3358	0.9027***	0.7822***	0.7497***	0.8068***
	(-0.86)	(3.35)	(3.05)	(2.91)	(3.14)
Provis	-0.6269**	-0.0678	-0.0353	-0.0738	-0.8643***
	(-2.26)	(-0.50)	(-0.32)	(-0.84)	(-5.38)
LnMVE	-0.0236	-0.0220	-0.0588	-0.0544	-0.0894*
	(-0.47)	(-0.38)	(-1.22)	(-1.10)	(-1.80)
MTB	-0.0206	-0.0722	-0.0167	-0.0116	0.1202*
	(-0.38)	(-1.25)	(-0.31)	(-0.21)	(1.94)
ROA	-1.3403*	-0.9900	-1.3503*	-1.2891*	-1.9116**
	(-1.77)	(-1.04)	(-1.77)	(-1.65)	(-2.42)
Prior Qtr Ret	-2.1613***	-1.8748**	-2.2058***	-2.2589***	-1.8903**
	(-2.60)	(-2.11)	(-2.65)	(-2.70)	(-2.32)
Recent EA	-0.0913	0.1015	-0.1123	-0.0985	-0.0347
	(-0.25)	(0.26)	(-0.31)	(-0.27)	(-0.10)
Busy EAs	-0.0017***	-0.0018***	-0.0016***	-0.0017***	-0.0018***
	(-4.15)	(-4.37)	(-4.04)	(-4.14)	(-4.34)
Fixed Effects	Industry	Industry	Industry	Industry	Industry
Observations	35,906	30,981	35,875	35,404	35,875
Adj. R-squared	0.015	0.016	0.013	0.014	0.019

Table 11 (continued)

Tax Reform Provisions and Returns to Insider Trades

Panel B: Other Provisions

Variable *Provis.*:	*DTAs*	*Interest Limit*	*NOL*	*PPE*	*DPAD*
Dep. variable:	*Profit*	*Profit*	*Profit*	*Profit*	*Profit*
	(1)	(2)	(3)	(4)	(5)
TCJA × Provis	-0.3857	0.4434	1.7972***	-0.1350	0.3887
	(-1.62)	(0.78)	(3.60)	(-0.47)	(0.65)
TCJA	0.7847***	0.5940**	-0.4743	0.8557***	0.7129**
	(3.06)	(2.03)	(-1.26)	(3.01)	(2.54)
Provis	0.1389	-0.2687	-0.2598	0.1145	-0.1159
	(1.10)	(-0.92)	(-1.27)	(0.84)	(-0.46)
LnMVE	-0.0638	-0.0720	-0.0543	-0.0718	-0.0548
	(-1.28)	(-1.39)	(-1.13)	(-1.32)	(-1.14)
MTB	-0.0110	-0.0069	-0.0185	-0.0014	-0.0140
	(-0.20)	(-0.13)	(-0.34)	(-0.03)	(-0.26)
ROA	-1.3219*	-1.5276*	-1.3568*	-1.2177	-1.3551*
	(-1.74)	(-1.85)	(-1.75)	(-1.55)	(-1.76)
Prior Qtr Ret	-2.1925***	-2.1815***	-2.1899***	-2.3497***	-2.2052***
	(-2.64)	(-2.60)	(-2.63)	(-2.73)	(-2.64)
Recent EA	-0.1057	-0.1228	-0.0900	-0.0110	-0.1212
	(-0.29)	(-0.34)	(-0.25)	(-0.03)	(-0.34)
Busy EAs	-0.0017***	-0.0015***	-0.0017***	-0.0020***	-0.0017***
	(-4.09)	(-3.63)	(-4.15)	(-4.39)	(-4.09)
Fixed Effects	Industry	Industry	Industry	Industry	Industry
Observations	35,906	34,725	35,906	30,951	35,797
Adj. R-squared	0.014	0.013	0.014	0.014	0.013

This table presents OLS estimates of how insider trading profitability during passage of tax reform varies with the impact of specific provisions of tax reform legislation. In each column, the placeholder variable *Provis* equals a proxy for the effect of one of several specific tax reform provisions. In Panel A, *Provis* equals one of five proxies for the effect of the TCJA's multinational and deemed cash repatriation provisions (*Multinational, # Jurisdictions, Equity Invst., PRE,* or *Cash*). In Panel B, *Provis* equals a proxy for the effect of another major provision: revaluation of deferred tax accounts (*DTA*), limited interest expense deductibility (*Interest Limit*), NOL use limitations (*NOL*), immediate expensing of depreciable assets (*PPE*), or repeal of the domestic production activities deduction (*DPAD*). In both panels, the observations in each column are restricted to those with non-missing data for *Provis*. When continuous, we standardize *Provis* to mean zero and standard deviation of one for interpretability. The independent variable *TCJA* is an indicator variable equal to one for observations during the passage of tax reform (November 2, 2017 through December 22, 2017), and zero otherwise. The dependent variable *Profit* equals the buy-and-hold return over the 30 days following an insider trade, multiplied by negative one for observations with net insider sales.

Appendix A provides complete variable definitions. We use Fama-French 48 classifications to define industry fixed effects. We winsorize variables at the 1st and 99th percentiles. T-statistics based on robust standard errors clustered by firm appear in parentheses below the coefficients. ***, **, and * next to the coefficients denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively.