Tax Reform and the Valuation of Superstar Firms

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Abstract

This paper uses an event study of the impact of the 2017 U.S. tax bill on share prices of publicly traded corporations to investigate the market power in the corporate sector. The corporate tax rate reduction from 35% to 21%, along with other changes, increased share prices on average, albeit with considerable variation among firms. The benefits of the tax bill were most apparent at the top: for example, while among the decile of firms with the highest profit rate almost 80% gained value upon news of the reform, merely 60% did among the lowest decile of firms. Furthermore, the gains were concentrated among firms with higher measures of profitability and market power, which is consistent with the presence of economic rents and imperfect market competition.

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1 Introduction

The presence of market power and the ability of a few firms to capture economic profits shapes the incidence of corporate income taxation. The last few decades have seen the rise of innovative firms that have managed to quickly gain large market shares in their respective sectors. Some of these companies have joined the ranks of the firms with the largest market capitalizations, sparking public debate regarding their ability to control such large portions of their respective markets.

Recent academic literature corroborates some of these concerns. De Loecker and Eeckhout [2017] and De Loecker et al. [2018] have documented a sharp increase in mark-ups since 1980, arguing that this has been driven by a rise in the market power of a few firms at the top of the mark-up distribution. This work has already been very influential in several fields of economics; Autor et al. [2017] and Dorn et al. [2017], for example, use a similar methodology to argue that this increase in mark-ups is tied to the recent fall in labor's share of GDP; Edmond et al. [2018] have considered the welfare effects of policies aimed at reducing mark-ups.

The effect of a corporate tax cut on the valuation of corporate equity is determined by the extent to which shareholders bear the burden of the corporate tax in the first place. If rents play a bigger role in determining a firm's value, then we would expect the shareholders of that firm to bear more corporate tax burden, and thus the price of their shares should be more responsive to cuts in the tax rate. With this consideration in mind, this paper explores the importance of market power in the valuation of the U.S. corporate sector by studying the effects of the Tax Cuts and Jobs Act (TCJA), which was signed into law on December 22, 2017. Among other provisions that are discussed in more detail in section 4, the reform reduced corporate income tax rates in the U.S. from a top rate of 35% to a flat rate of 21%.

My contribution is to study market power through its empirical connection to the excess return on a firm's stock upon news of tax rate changes. I use a continuous differences in differences setting to study how the excess returns due to news of the tax cut correlate with traditional measures of profitability and market power. The results show that firms with high shares in more concentrated industries and firms with bigger profit margins gained significantly more from the reduction in corporate tax rates. This is consistent with the interpretation that variation in the measures of profitability and market power do not entirely reflect differences in productivity. Some variation derives from real rents that cannot be competed away by potential entry, either in the short run or in the long run.

To quantify the excess returns due to news of the tax cut, the paper relies on data from betting markets. Doing this reveals sizeable effects of the measures of profitability and market power. Going from perfect competition to a position of monopoly, for instance, increases the excess return a company accrues due to the tax rate change by between 5 and 105 percentage points. Excess returns also exhibit a positive relationship with the raw accounting profit margin, or Lerner index. On December 20, 2017, the last date identified as containing meaningful news on the passing of the bill, a one standard deviation change in Lerner index is associated with an increase in returns of 29.9 percentage points. Standardizing results by the "amount" of news released on each date also reveals that investors might be reacting to surprising developments about other details of the tax bill, rather than a pure increase in the probability of a tax cut.

I then turn to a fixed-effects model to investigate how excess returns due to the TCJA varied for each individual company. The distribution of excess returns exhibits a long right tail that features some prominent large companies such as Apple, Microsoft, Facebook, and Google. Quantifying the results with betting data reveals a strong concentration of gains from the tax cut. The top 1% of firms gaining from the tax bill earn 38% of the total gains; the top 5% earn 69.3% of the gains; the top 25% earn 94.7%, or almost the totality of the gains.

The rest of the paper proceeds as follows. Section 2 reviews the literature on corporate tax incidence and gives some background on the present state of the literature, contextualizing the contribution of this paper. Section 3 lays out a simple framework to think about the excess returns earned by a firm upon a cut in the corporate tax rate. Section 4 describes the data and gives some institutional background. Section 5 describes the methodology and the results of the empirical analysis. Section 6 concludes.

2 Background

This paper studies how news regarding a corporate tax cut in the U.S. affected the excess returns of U.S. corporations, and how this effect correlates with measures of profitability and market power. Generally, the effect of a tax cut on the excess returns of a company will be influenced by who bears the burden of corporate taxes. If shareholders bear all of the burden, firm values will simply increase linearly with the cut in tax rates. If, on the other hand, the burden can be entirely shifted away, such as to workers in the form of lower wages or consumers in the form of higher prices, then news of the tax cut will not affect firm valuations.

The modern study of corporate tax incidence began with the Harberger [1962] model, in which the incidence of the corporate tax depends crucially on the intersectoral reallocation of capital. Dividing the economy into a corporate and a non-corporate sector, he points out that higher corporate tax rates will increase the cost of corporate capital, thereby reducing the demand for capital economy-wide. Depending on how mobile capital is between these two sectors, it could be owners of all capital, not just corporate capital, who bear the burden of the tax. Further, a tax increase will induce a reduction in corporate output demanded, and thus a shift in production from the corporate to the non-corporate sectors. Depending on which sector is more labor-intensive, and how easy consumers find it to switch between the two kinds of output, labor may bear some or even all of the tax. If the corporate sector is relatively labor-intensive, then the shift of production toward the non-corporate sector can even have the effect of raising capital demand overall, which means that labor would bear more than the entire burden of the tax.

The initial findings of Harberger [1962] were followed by a large body of work, both theoretical and empirical, on the incidence of corporate taxes. On the theoretical side, subsequent work has noted that if there are frictions that prevent capital from reallocating immediately between sectors, then incidence might be higher for corporate shareholders. In a q-theory of investment such as the one in Summers [1981], capital will take some time to move between sectors, while asset values will adjust immediately, thus inflicting a larger burden on corporate than on non-corporate capital owners. Reviewing issues of international taxation, Gordon and Hines [2002] note that open economy considerations further complicate the picture. If capital is perfectly mobile, corporate tax changes in one country cannot affect the after-tax return to capital, and thus the entirety of the burden falls on fixed factors of production, most notably labor and land.

Issues of imperfect competition also complicate the incidence of corporate taxes, and are of primary importance to this paper. Any rate of return earned by corporate capital on top of the risk-adjusted rate of return is a rent, and taxes on corporate rents are generally entirely borne by shareholders.[1] The simplest example of this is a tax on a monopolist's profits: because the monopolist maximizes pre-tax profits, regardless of the tax rate, its behavior will not be distorted and shareholders will bear the entire burden of the tax.

One notable exception from the simple monopoly reasoning is that corporate rents can arise as returns on intangible capital held by firms. In this case, the corporate tax can be seen as a tax on entrepreneurial effort, and its incidence will depend on how it affects the process of creation of new ideas. As Auerbach [2006] vividly puts in his review of the literature on corporate tax incidence, "the garages of Silicon Valley might have been used to store cars if the corporate tax rate had been higher." To the degree that the creation of new ideas is not influenced by the corporate tax, a tax on corporate rents will still fall mainly on corporate shareholders. While gathering conclusive evidence on this matter is far from trivial, Akcigit et al. [2018] find evidence suggesting that taxes do matter for innovation, or at least for its

[1] See, for instance, the discussion in Auerbach [2006].

distribution across U.S. states. My results suggest that big tech firms did not face a sharp increase in competition due to the reduction of the corporate tax rate – at least not in the short run.

A second issue is that the corporate tax might affect the equilibrium of a dynamic game of imperfect competition. Davidson and Martin [1985] note that a corporate tax increase might affect companies' ability to punish each other in the event of a deviation from collusive behavior, which would also make it distortionary. Furthermore, if the tax base does not coincide with pure rents, imperfect competition might worsen the welfare effects of taxation and can lead to tax over-shifting, whereby a tax induces prices to increase more than one-for-one. Fullerton and Metcalf [2002] review the literature on tax incidence and derive the conditions under which over-shifting would be induced by an excise or an ad-valorem tax.

Empirical work on corporate tax incidence tends to conclude that at least some of the corporate tax burden is shared by factors of production other than corporate capital. Much of this work is focused on assessing the impact of corporate tax on wages. Analyzing union wage premiums, Felix and Hines [2009] find that workers in unionized firms capture slightly over half of the benefits of low tax rates. Arulampalam et al. [2012]'s analysis of wages and corporate taxes in Europe agrees with this finding, suggesting that about half of the burden of corporate taxes falls on labor. Looking at cross-industry differences in corporate tax rates in the U.S., Liu and Altshuler [2013] find that the elasticity of wages with respect to the corporate marginal effective tax rate is higher in more concentrated industries, a fact seemingly at odds with the findings of this paper, which suggest that greater concentration is tied to larger excess returns due to the tax cut. But as noted by Auerbach [2006], situations of imperfect competition, where market outcomes are already distorted by the desire of companies to artificially limit output, might exacerbate the distortions of the corporate tax. More recent studies of corporate tax incidence have focused on sub-national variation in corporate tax rates. Suárez Serrato and Zidar [2016] use variation in corporate tax rates across U.S. states to estimate a model with imperfect labor and firm mobility. They find that firm owners bear about 40% of corporate taxes, workers bear 30-35%, and landowners 25-30%. Fuest et al. [2018] use variation across German municipalities, finding that workers bear roughly one half of the corporate tax burden.

The most recent U.S. tax reform has spurred a new wave of empirical studies on the effects of corporate tax policy. While arguably the most salient feature of the TCJA for corporations was a reduction in corporate tax rates, it contained a variety of provisions which are reflected in the breadth of the studies on the topic. Wagner et al. [2018b], for instance, document that the stock prices of internationally-oriented firms suffered from news of the TCJA, and that the aggregate market responded positively to lower expected taxes. Blanchard et al. [2018] find that increases in expected dividends – in which the corporate tax cut played a significant role – were largely responsible for the increase in stock value over the year following the election of President Trump. Gaertner et al. [forthcoming] study the effects on foreign companies, finding that Chinese firms, especially in steel manufacturing, experienced large negative returns, while the rest of the world experienced positive returns. Wagner et al. [2018a] analyze the effects of Trump's election on the U.S. stock market, finding that expected tax rates greatly impact firm value. Hanlon et al. [2018] look at the actions and *statements* about actions of companies in the aftermath of the TCJA, finding, among other things, that share buybacks generally increased in the aftermath of the TCJA, but that this increase was concentrated in a small number of firms. Sterk and Sterk [2019] simulate the long-run consequences of the TCJA, finding that the reduction in corporate tax rates and the introduction of immediate expensing could lead to a substantial increase in firm entry and exit.

This paper stands out from existing literature in its focus on the relation between the excess return earned due to news of the TCJA and traditional measures of profitability and market power. While in much of the paper I will be speaking about the effects of a tax cut, my empirical analysis measures the effects of *news* regarding a possible future tax cut. The late 1980's and the 1990's saw a spur of interest in questions regarding belief about future policy. Auerbach and Kotlikoff [1987], Auerbach and Hines [1988], Cutler [1988], Poterba [1989], Rodrik [1991], and Slemrod and Greimel [1999] are all concerned with how changes in expectations regarding future tax policy affect current decision making, both by firms and individuals, both in financial markets and in the real economy. Cutler [1988]'s analysis of the 1986 Tax Reform Act's (TRA86) effect on stock market prices provides an analysis that parallels this paper. Among other things, Cutler points out the effect of tax reform on firm value is ambiguous, a reality that in his case was further aggravated by the fact that TRA86 drew a distinction between old and new capital via the Investment Tax Credit. This paper builds on his framework by using techniques more in line with the modern literature in empirical finance.

A more recent strand of literature, starting with Bloom [2009] and Baker et al. [2016], seeks to understand the effects of policy uncertainty on real economic behavior. This new strand of literature has made significant strides in understanding how changes in both expectations and variances impact economic decisions, but much remains unanswered: measuring expectations is notoriously difficult, and models of dynamic stochastic decision-making get complicated very quickly.

A related literature has studied the effects of policy beliefs more generally and in a variety of fields of economics. Friedman [2009], who used news on regulations of drug coverage to estimate the incidence of Medicare Part D, is a methodological predecessor to this paper: instead of taking an out-right event-study approach, I use a more continuous approach that allows me to do something closer in spirit to a difference-in-difference estimation. Graziano et al. [2018], Handley and Limão [2017], and Carballo et al. [2018] have studied the effects of changing beliefs regarding trade policy, while Meng [2017] has used prediction market data regarding the passing of an anti-pollution cap-and-trade bill to estimate the marginal abatement cost of proposed policy.

The great potential applications for prediction market data, which this paper makes use of, have been advocated for some time in the literature, starting with papers like Arrow et al. [2008]. Some early applications include Slemrod and Greimel [1999], who studied how the probability of Steve Forbes winning the presidency influenced the returns for municipal bonds, Wolfers [2006], who studied point-shaving in NCAA basketball, or Snowberg et al. [2011], which advocated the use of betting data in event studies. While some authors, such as Manski [2006], have cast some doubt on the use of these data, arguing that there is no theoretical guarantee that betting odds will reflect average or even median beliefs, Wolfers and Zitzewitz [2006] offer some theoretical justification as well as some empirical evidence in support of interpreting betting prices as average beliefs.

3 A Simple Model of Corporate Tax Incidence

This section lays out a simple theoretical model of excess returns, and relates it to the discussion of corporate rents. It then connects the predictions of the theoretical framework to the methodology used in the empirical analysis. As discussed in section 2, the effect of a corporate tax cut on the excess returns of a company's equity depends crucially on the degree to which shareholders bear the burden of the tax. The analysis assumes that firms are entirely financed by equity,[2] and considers what happens to the value of this equity starting at a certain corporate tax rate, $\tau \in (0, 1)$.

Firm i's discounted sum of future after-tax profits, $\bar{V}_i = \bar{V}_i(\tau)$, is determined by two distinct components, $V_{i1} = V_{i1}(\tau)$ and $V_{i2} = V_{i2}(\tau)$:

$$\bar{V}_i = V_{i1} + V_{i2}.$$

[2]While this assumption significantly simplifies exposition, note that little would be different if firms do not change their ratio of equity to debt financing, which will be true for a marginal tax change if firms were choosing their financing ratios optimally before the change. Although certainly the change in corporate tax rate induced by the TCJA was not marginal, this might alleviate concerns that results are heavily influenced by financing considerations.

V_{i1} represents profits from operations where tax burden can be shifted to other entities, such as workers, consumers, or owners of non-corporate capital, while V_{i2} represents profits from operations whose pre-tax value is not influenced by variation in τ, as would be true for pure economic profits. Letting $\Pi_{i1}(\tau)$ and Π_{i2} represent the present discounted value of quasi-rents from each kind of operation, we will have:

$$\begin{aligned} V_{i1}(\tau) &= (1-\tau)\Pi_{i1}(\tau) \\ V_{i2}(\tau) &= (1-\tau)\Pi_{i2}. \end{aligned} \tag{1}$$

Appendix A provides an example where firm value can be broken down in two parts with the same properties as in equation 1. When the entry of new competitors is impossible, the full burden of the corporate tax falls on firm owners; when entry is costly but possible, firms will bear less than the full burden.

Consider a marginal increase in the tax rate. Since the tax burden imposed on $V_{i2}(\tau)$ falls entirely on equity holders, a marginal tax increase will be entirely reflected in value: $dV_{i2}/d\tau = -\Pi_{i2}$. The same does not hold for V_{i1}, which will change only to the degree that any of the tax burden imposed on this part of profits actually falls on the firm:

$$\frac{dV_{i1}}{d\tau} = -\Pi_{i1}(\tau) + (1-\tau)\frac{d\Pi_{i1}(\tau)}{d\tau}.$$

As discussed in Appendix A, what will determine $d\Pi_{i1}(\tau)/d\tau$ in the case of a tax cut is the speed with which new firms can enter the market and compete with incumbents. On one extreme, if entry takes an infinitely long time, then the company's pre-tax profits decrease infinitely slowly, and so

$$\frac{d\Pi_{i1}(\tau)}{d\tau} = 0.$$

On the other extreme, if entry is immediate and the increase in after-tax profits is quickly competed away, then $dV_{i1}/d\tau = 0$, or

$$\frac{d\Pi_{i1}(\tau)}{d\tau} = \frac{\Pi_{i1}(\tau)}{1-\tau}.$$

Assuming that $d\Pi_{i1}(\tau)/d\tau$ can only vary between these two extremes allows us to express it as a convex combination of the two. For some $\alpha_i \in [0, 1]$:

$$\begin{aligned}\frac{dV_{i1}(\tau)}{d\tau} &= -\Pi_{i1}(\tau) + (1-\tau)\alpha_i \frac{\Pi_{i1}(\tau)}{1-\tau} \\ &= -(1-\alpha_i)\Pi_{i1}(\tau).\end{aligned}$$

Therefore, one can think of α_i as the fraction of the burden on V_{i1} that is not borne by firm i.

Given these two pieces, the excess returns that the firm earns upon a marginal cut in the corporate tax rate will be:

$$\begin{aligned}r^e \equiv \frac{-d\bar{V}_i/d\tau}{\bar{V}_i} &= \frac{(1-\alpha_i)\Pi_{i1} + \Pi_{i2}}{V_{i1} + V_{i2}} \\ &= \frac{1}{1-\tau}\left(1 - \frac{\alpha_i}{1 + \frac{\Pi_{i2}}{\Pi_{i1}}}\right). \qquad (2)\end{aligned}$$

This expression reveals two important implications. First, the lower α_i the more tax burden falls on shareholders, and so excess returns on the firm's equity upon news of the tax cut are decreasing in α_i. Second, the higher the ratio of rents to other profits Π_{i2}/Π_{i1} the more important rents are in determining firm value, so higher values of Π_{i2}/Π_{i1} will result in a bigger excess returns upon a tax cut.

The empirical work that follows studies how excess returns due to news about the TCJA correlate with several measures of a firm's profitability and market power. More specifically, the analysis focuses on (i) market capitalization, which is a measure of firm size, (ii) the

Herfindahl-Hirschman index, computed as the sum of squared shares in an industry and traditionally used as a measure of market power, interacted with own market share and (iii) the Lerner index, a firm's accounting profit margin, computed as the ratio of operating profits minus depreciation over revenues.

Observing a positive relation between one of these measures and excess returns could mean 1) that those firms with higher measures of market power earn high rents, meaning that they have a high V_{i2}/V_{i1}, or 2) that they tend to have a low α_i, which could be due to high adjustment costs of transferring capital in and out of the firm or frictions that prevent the entry of new firms or the exit of incumbents. In either case, the firm's profits are more insulated from new competition upon a reduction in the tax rate. In the limit as the time for competition to enter goes to infinity, the two interpretations coincide.

4 Data

Some data for this study come from a merge between the Center for Research in Security Prices (CRSP) and Compustat, including data on the daily holding returns of various stocks in the New York Stock Exchange (NYSE) and the companies to which they are tied. The study focuses on the period starting after the 2016 presidential election, on November 9, 2016, and ending on the day in which the Tax Cuts and Jobs Act was signed into law, on December 22, 2017, using both firm accounting data on items such as foreign profits or revenue and financial data such as holding returns and market value. Summary statistics for the relevant variables can be found in the Table 6 in the Appendix.

Additional data include information on news regarding legislative prospects of the tax bill. This paper uses six dates identified by Gaertner et al. [forthcoming] as particularly relevant for the development of tax reform in 2017.[3] They document spikes in Google

[3] These dates are: September 27, 2017 (United Framework for Tax Reform unveiled - Member retreat), November 2, 2017 (TCJA introduced in the House), November 16, 2017 (House passes TCJA), December 2, 2017 (Senate passes TCJA), December 15, 2017 (Bill reported by the joint conference committee), December 20, 2017 (Final version agreed to by the Senate).

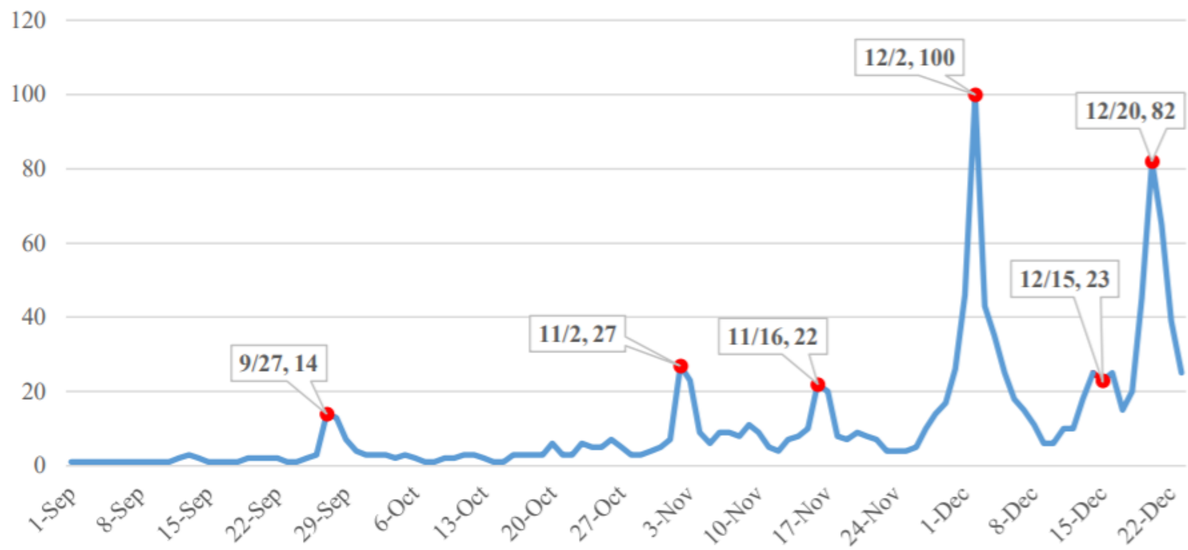

Figure (1) Google trends data for searches regarding "tax reform". Source: Gaertner et al. [forthcoming].

searches regarding "tax reform", depicted in Figure 1, on these dates, and argue that this is due to the fact that these were surprising events at the time, which attracted the public's attention on the tax bill. In their paper, they also use these dates to perform event studies on the stock returns of foreign companies.

In addition to these dates, the paper uses data from a bet undertaken on the web platform PredictIt.org, which organizes bets among users around the world. Betting on PredictIt is entirely user-based; any registered individual can post a "Buy" or a "Sell" contract for each possible outcome, which in the case of our bets of interest is always binary ("Yes" or "No"). Contracts pay out nothing to losing users, and $1 to winning users, and the price is simply the share of that dollar paid in by each of two users taking part in the bet. No user can wager more than a total of $850 on a single bet, and PredictIt makes money by charging a 10% fee for all winnings in excess of money invested, plus a 5% withdrawal fee. As a result, users will want to buy "Yes" contracts that have a price (adjusted for fees) lower than their subjective probability of a "Yes", and sell contracts with a price higher.

As Graziano et al. [2018] point out, one need not interpret these implied probabilities as the true, homogeneous belief of all agents in the economy, or even as the true average belief in the economy, as long as one is willing to suppose that the price of these contracts is strongly correlated with individual beliefs, and as long as agents do not systematically change belief in direction opposite to that of the change in odds.[4] This paper uses changes in betting contract prices to proxy how financial markets react to shocks to policy expectations.

Other literature on the TCJA, such as in Blanchard et al. [2018], has used a PredictIt betting series that started the day after the 2016 presidential election, November 9, 2017, and asked whether there would be a cut in the corporate tax rate by December 31, 2017. Gaertner et al. [forthcoming] point out that the biggest in this series spikes do not seem to match up with either the Google trends data they use nor with conventional wisdom about the developments of the tax bill. This might be driven by the fact that, except for the last few months of the bet, this specific betting market was not very thick, and certainly not as thick as for other bets on the same website,[5] so a few outliers could disproportionately move the price on any given day. Figure 2 shows the contract price series overlaid by the salient events described in Figure 1. The series declines until late 2017 when legislative framework is unveiled and the bill begins to move through Congress. Not all events match up with the changes as one would expect, and that the largest spike in the price occurs on August 9, 2017, which does not seem to match up with any event of note. A simple explanation for this random spike is that a) limits on the amount that each user can wager on a single bet mean that some mispricing might not get arbitraged away, and b) this is particularly true on days when very few people are betting; it is not surprising to find out that on August 9, 2017, only two users were exchanging contracts on this bet.

Another issue with this particular series of futures prices is that it asked users to bet on whether there would be a cut in the top corporate tax rate *by December 31, 2017*, not necessarily whether one was going to happen imminently or eventually. This can be an issue that is strongly reflected in the betting odds on some days at the very end of the

[4] This could technically happen, for instance, if agents with radically different priors interpreted the same signals in systematically opposite ways.

[5] E.g., betting odds on the election of Donald Trump are more widely used and acknowledged as a good proxy for the public's beliefs

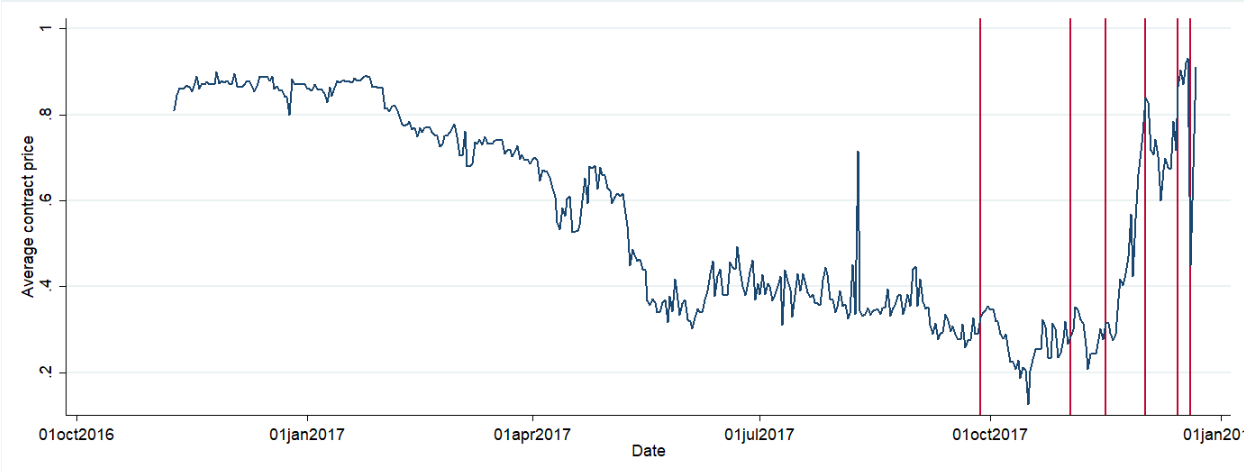

Figure (2) Average price for a "Buy Yes" contract in the bet "Will there be a corporate tax cut by December 31, 2017?". Each red line represents one of the events identified by Gaertner et al. [forthcoming] using Google Trends data.

series, as right before passing the law there were some tensions between President Trump and the Republican-controlled Congress regarding funding for immigration control, and for a moment it seemed possible that the signing of the tax bill would have to be postponed to the new year. On December 20, 2017, for example, which is the last date identified by Gaertner et al. [forthcoming] using Google trends data, and only two days before the final signing of the bill into law, the probability that the bill is not signed into law, according to this bet, jumps *down* by almost 48.4 percentage points, which clearly reflects the possibility that there would be a corporate tax cut by year-end 2017, not the possibility that there would be a tax cut at all.

I analyze a new bet started by PredictIt on October 23, 2017, which asked whether there would be a corporate tax cut by March 31, 2018. One drawback of using these data as opposed to the older bet is that it has lower total volume, as the longer-running bet was likely more salient to users: the average number of contracts exchanged in the older bet on any day is 2245.7, but only 893.3 in the newer one; the average number of users exchanging contracts is 52 in the older one, but only 21 in the newer one. Another issue is that because the bet starts on October 23, this leaves out the first of the dates identified by Gaertner et al. [forthcoming], September 27, 2017. However, the new bet is not plagued by timing issues that would be irrelevant to this analysis, and the betting volume is more spread out over the lifetime of the bet (see figures 8 and 9 in the Appendix). This could be due to the fact that this bet was running over a period in which tax legislation was fairly uniformly relevant in the news. Furthermore, the price of the futures contract lines up better with the dates used by Gaertner et al. [forthcoming], as we can see in Figure 3. The empirical analysis uses these betting odds as its main point of reference.

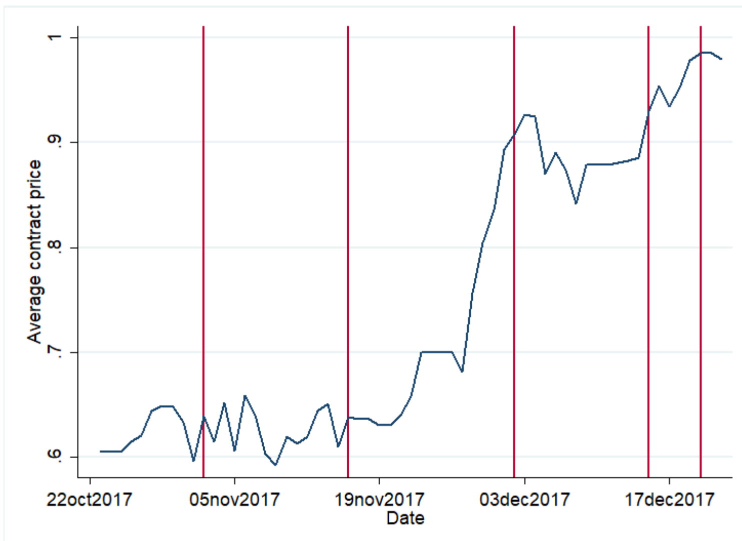

Figure (3) Average price for a "Buy Yes" contract in the bet "Will there be a corporate tax cut by March 31, 2018?". Each red line represents one of the events identified by Gaertner et al. [forthcoming] using Google Trends data.

4.1 Institutional Background

While tax reform had long been a campaign issue for Donald Trump, the first year of his presidency was spent mostly focusing on health reform. When these efforts stalled in the summer, Congressional Republicans decided to make tax reform their flagship issue for the coming fiscal year,[6] by tying it to the budget reconciliation process under H.Con.Res71, Title II. After that, as Wagner et al. [2018b] point out, the process moved swiftly, making the setting ideal for an event study.

[6]See, for instance, here for Sen. Pat Toomy's call to"focus on taxes right now" after the last Republican attempt to reform health care.

The final version of the bill contained numerous provisions regarding the taxation of both individuals and firms. In particular, it contained a cut in the corporate tax rate, which went from a top rate of 35% to a flat rate of 21%. This was a slightly higher final rate than previous proposals, which were at 15% according to Trump's plan released in April 2017, and at 20% according to the House Republican plan of June 2016. The TCJA also allowed for immediate expensing of capital expenditures.

The TCJA also contained major changes to the taxation of multinational entities, shifting the U.S. from a worldwide to a territorial tax system, by allowing businesses to deduct completely dividends received by 10%-owned foreign corporations. However, it also introduced measures to curtail shifting profits to low-tax jurisdictions with minimum tax schemes such as GILTI (Global Intangible Low-Taxed Income) on intangible assets and BEAAT (Base-Erosion and Anti-Abuse Tax) on income from low-tax jurisdictions, as well as measures to encourage U.S. based intangible property, such as FDII (Foreign Derived Intangible Income), a reduced tax rate for income generated abroad attributable to intangible property held domestically. The bill also included a one-time repatriation tax on all foreign-held income, which went from 12% in the first version considered by the House Ways and Means Committee on November 2, to 15.5% in the final version of the bill.

Finally, the TCJA also included various changes to the taxation of non-corporate business income, which might have affected competitors of corporations in the markets in which they operate. In particular, it allowed for a deduction of up to 20% of Qualified Business Income from a firm's tax liability. This deduction was limited for based on the type of business in which a pass-through entity is involved or the taxable income of the person claiming the income.

5 Empirical Analysis

5.1 Controlling for Market Forces

Analyzing raw stock market returns could conflate the effects of interest with other factors that happen to coincide with them. This issue is particularly relevant if one is trying to infer aspects of the heterogeneity of the effect across firms. Controlling for market forces, while necessary to construct a counterfactual, could distort the overall magnitude of the effect of the tax bill. Suppose for instance each firm's expected excess return is equal to a constant times the market excess return. If the TCJA affected the return on the market portfolio, then we might mistake movements in a firm's return due to changes in the market return with movement due to changes in the corporate tax expectations. This is the reason why Gaertner et al. [forthcoming] use raw returns rather than basing their analysis on an asset pricing model.

This paper opts instead to use "abnormal returns" as the dependent variable,[7] rather than raw returns in excess of the risk-free rate, in order to control for change in these risk factors. Appendix D shows that the sign of the results is mostly unchanged when using raw excess returns or alternative asset pricing models, although with larger standard errors. [8]

In order to take financial market forces into account, the analysis begins by estimating a model of stock market returns in the spirit of Fama and French [1993] on a period *preceding* the election of President Trump, to get a sense of how each company's stock moves with the rest of the financial market. In their three-factor model the stock market returns of company $i = 1, \ldots, N$ in day $t = 1, \ldots, T$, $R_{i,t}$, depends on the risk-free rate of return, R_t^f, the returns to a market portfolio, R_t^m, the persistent effects of book-to-market equity, a High-Minus-Low portfolio (HML_t), and the persistent effects of firm size as measured by

[7]This is akin, for example, to the approach adopted by Wagner et al. [2018b] in a very similar setting regarding the TCJA.

[8]Specifically, the results for market capitalization, which are the weakest among the main results, sometimes change sign. The results for Herfindahl-Hirschmann index have the same sign but are not significant under other asset pricing models. The results for the Lerner index have the same sign and magnitude under all specifications, but lose significance under the 5-factor Fama-French model.

its market capitalization, a Small-Minus-Big portfolio (SMB_t):[9]

$$R_{i,t} - R^f_t = \beta^m_i(R^m_t - R^f_t) + \beta^{HML}_i HML_t + \beta^{SMB}_i SMB_t + u_{i,t}.$$

Assuming that the β's in this model do not change between the pre-period consider and the sample period relevant for the analysis, the estimates $(\hat{\beta}^m_i, \hat{\beta}^{HML}_i, \hat{\beta}^{SMB}_i)$ can be used to construct expected returns during our sample period of interest, namely the months leading up to the passing of the TCJA. I will use these expected returns to construct "abnormal returns" for each company in every period, $AR_{i,t}$:

$$AR_{i,t} \equiv (R_{i,t} - R^f_t) - \hat{\beta}^m_i(R^m_t - R^f_t) - \hat{\beta}^{HML}_i HML_t - \hat{\beta}^{SMB}_i SMB_t.$$

Having abnormal returns for every company in the sample, the paper proceeds to study how news shocks regarding the tax bill affected returns relative to what we would have expected. More specifically, in the spirit of the model laid out in section 3, the plan is to study whether firms that might be deemed more profitable ex-ante also saw the biggest increase in returns upon news of the tax cut.

5.2 Relation to Measures of Profitability and Market Power

As section 3 discusses, we should observe excess returns to be higher for firms that do not face potential rent-eroding entry, or that face entry only in longer periods of time. This section uses a continuous differences-in-differences setting to study the relationship between the excess returns upon news of the tax bill and several aspects of firms. The main specification of interest is of the sort:

$$AR_{i,t} = \beta_0 + \beta_1 M_i + \beta_2 M_i \times TCJADates_t + \zeta_t + \xi_{\mathcal{I}(i)} + \gamma' \mathbf{X_{i,t}} + \varepsilon_{i,t}, \qquad (3)$$

[9] These last three values, R^m_t, HML_t, and SMB_t, are taken directly from Kenneth French's website.

where $TCJADates_t$ is a dummy equal to one if day t is one of the six dates identified by Gaertner et al. [forthcoming];[10] ζ_t are a set of time fixed-effects; $\xi_{\mathcal{I}}$ are a set of industry fixed effects;[11] and $\mathbf{X_{i,t}}$ is a vector of controls, including what fraction of a company's profits came from abroad in previous years, and the average tax rate that they face abroad (both are assumed to be zero if a firm only operates domestically). This is quite important because the TCJA changed many provisions regarding the treatment of corporations' foreign income, which likely affected future profits differently depending on how much profit a company was earning abroad, and depending on the locations of these operations, including the tax rates faced therein. As a result, the vector of controls includes the interaction between these two variables and $TCJADates_t$. M_i is a measure of firm i's size, profitability, and market power; I explore three different measures: the firm's market capitalization, the firm's market share interacted with the Herfindahl-Hirschman Index (henceforth, HHI) of its industry,[12] and the firm's Lerner Index.[13] All of these, as well as controls regarding foreign income, are measured at the end of fiscal year 2016 to minimize the possibility that firms might have adjusted their behavior in anticipation of the tax reform.

The resulting estimate of β_2 will indicate how firms with a larger measure M_i were differently impacted by the news of the tax bill, by measuring how their stock market returns differed, on average, during our six dates of interest. If the ability to exclude competitors, in the short run or in the long run, mattered for the distribution of excess returns across companies, and if indeed this ability is reflected in M_i, this should result in positive estimates of β_2.

The first version of specification 3 uses market capitalization as a measure of size, and

[10]While this procedure weighs each date equally, further analysis in section 5.3 will decompose the effect of each date.

[11]Industry here is defined as the first three digits of a company's NAICS code.

[12]Based on Compustat sales data and 3-digit NAICS sectors. Unfortunately, using Compustat sales data excludes a number of potential competitors who do not file 10-K's and thus do not appear on Compustat. Appendix F shows that results obtained here with Compustat data can be replicated qualitatively using concentration data from the U.S. Census, which are only available for the manufacturing sector.

[13]The Lerner index is also built from Compustat data following established literature, as the ratio of operating income before depreciation minus depreciation, over sales.

looks at different segments of companies quoted on the NYSE. Results are reported in Table 1. The coefficient on Market Cap $\times TCJA\ dates$ is negative for firms at the bottom of the distribution of market capitalization, but becomes positive and significant for firms in the top quartile and decile of the distribution. The coefficient is even bigger for firms in the top 1%, though not statistically significant – an unsurprising result, perhaps, given how much sample size was reduced. Further, market capitalization is likely to be a noisy measure of size, especially since it is being measured a year in advance of the periods we are considering to avoid possible anticipatory effects.

While size is generally not very strongly correlated with excess returns upon news of the tax cut, this might be expected. As Appendix A points out, differences in size can be explained by differences in entry costs even in the case where firms face free and immediate entry, and thus bear none of the burden of the corporate tax. Measures of profitability and market power exhibit much stronger statistical relations. As we can see in Table 2, market share and market concentration, as well as the accounting profit margin measured by the Lerner index, increase how a company's return increased in response to news of the tax bill. These results are consistent with the explanation that differences in market power have been a significant factor in explaining the cross-firm heterogeneity in excess returns due to news of the tax bill.

In order for these results to be interpreted as a valid differences in differences design, one should check that there are no significantly different pre-trends between groups with different degrees of treatment. This test is complicated in this case by the fact that differences in M_i can only pick up variation in the intensity of treatment, but there is no group of firms that was not affected by the tax bill, which leaves us without a true control group. Naturally, since we are analyzing stock market returns, any theory which predicts excess returns to follow a random walk would have to satisfy the no pre-trends assumption. Nonetheless, Appendix E.1 provides some empirical robustness checks for this assumption, showing that in the months leading up to the passing of the TCJA, the interaction between each date and

Table (1) Continuous diff-in-diff regressions of abnormal returns. Standard errors, in parentheses, are clustered by day.

	Dependent Variable: Abnormal Returns						
	All Firms	Quartile I	Quartile II	Quartile III	Quartile IV	Top decile	Top 1%
Market Cap.	-0.000173**	-0.654	-0.0181	-0.0220**	-0.0000458	0.00000641	0.000151
	(0.0000689)	(0.439)	(0.0519)	(0.00878)	(0.0000627)	(0.0000643)	(0.000101)
Market Cap. $\times TCJA\ dates$	0.000155	-8.023	-0.388	-0.0382	0.00130**	0.000754*	0.000560
	(0.000748)	(5.328)	(0.536)	(0.0593)	(0.000484)	(0.000424)	(0.000795)
Proportion of foreign profits	-0.00132	-0.000861	-0.00120	0.00108	-0.00187	0.00301	-0.00145
	(0.000824)	(0.00228)	(0.00139)	(0.00235)	(0.00118)	(0.00223)	(0.0169)
Proportion of foreign profits $\times TCJA\ dates$	-0.00556	0.0115	-0.0224	-0.0112	0.0170**	-0.0171	-0.0843
	(0.00578)	(0.0112)	(0.0155)	(0.0211)	(0.00829)	(0.0299)	(0.184)
Avg. for. tax rate	-0.00196	0.000302	0.0000975	-0.00506	-0.00357	-0.00282	-0.00646
	(0.00162)	(0.00717)	(0.00183)	(0.00313)	(0.00511)	(0.00654)	(0.0490)
Avg. for. tax rate $\times TCJA\ dates$	0.0154	-0.0488	0.0295**	0.0160	0.0692**	0.0392	-0.292
	(0.0136)	(0.0447)	(0.0107)	(0.0250)	(0.0252)	(0.0477)	(0.228)
N	1,126,540	266,018	279,477	284,891	296,437	119,008	12,452
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

	Dependent Variable: Abnormal Returns	
	Herfindahl	Lerner
Market share	-0.173	
	(0.118)	
$HHI\times$ market share	0.226	
	(0.206)	
$HHI\times$ market share $\times TCJA\ dates$	0.898*	
	(0.465)	
Lerner index		5.11e-12
		(1.34e-11)
Lerner index $\times TCJA\ dates$		0.000286**
		(8.05e-11)
Proportion of foreign profits	-0.00143*	-0.00166**
	(0.000818)	(0.000815)
Proportion of foreign profits $\times TCJA\ dates$	-0.00604	-0.00558
	(0.00588)	(0.00575)
Avg. for. tax rate	-0.00119	-0.00129
	(0.00162)	(0.00161)
Avg. for. tax rate $\times TCJA\ dates$	0.0155	0.0175
	(0.0133)	(0.0127)
N	1,274,778	1,166,039
Industry FE	Yes	Yes
Time FE	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table (2) Continuous diff-in-diff regressions of abnormal returns. Standard errors, in parentheses, are clustered by day.

each measure of M_i tracks changes in betting market odds.

Even though the main results of interest in Table 2 are statistically significant, even after clustering standard errors by day, the magnitudes seem surprisingly small. Column (1) implies that compared to being in perfect competition (that is, $s_i \approx 0$ and $HHI_{\mathcal{I}} \approx 0$), being a monopolist in one's sector only raises the gain from the tax bill by less than 0.9 percentage points. Column (2) implies that a one standard deviation increase in a firm's Lerner index is associated with a 0.7 increase in excess returns. These number represent a fraction of the standard deviation in excess returns, which is around 3.5 percentage points in the sample. It should be noted, however, that these results are averaging out across six different dates, throughout a time when the tax bill was undergoing major changes, and which did not necessarily reflect the entire effect of the tax bill. In order to better quantify the effect of news on each date, the next section makes use of betting data.

5.3 Cardinal Interpretations

The existence of betting markets specifically on the corporate tax reform quantify the news shocks used in the study, which in turn can yield a better quantitative interpretation of the results. As section 2 points out, what the empirical work is trying to measure is not really the reaction of a firm's value to a change in tax rate, but rather the reaction to a change in *expectations* about future tax rates. Suppose that with probability P, the tax rate is decreased by a marginal amount, and that otherwise it remains the same. Taking a weighted average of excess return as defined in equation 2, we obtain:

$$\mathbb{E}_P[r^e] = Pr^e + (1-P)0 = Pr^e.$$

Note that $r^e = 0$ in the event of no tax change, because when the tax rate does not change, the company's equity is simply earning the normal rate, or in other words is earning zero excess returns.

Observing a change in P, as betting data permits us to do, allows us to back out the full extent of the excess return due to a marginal reduction in the tax rate. Suppose, for instance, that the probability of a tax cut goes from P to P'. Ignoring discounting issues over such short time periods, we have:

$$\Delta\mathbb{E}_P[r^e] \equiv \mathbb{E}_{P'}[r^e] - \mathbb{E}_P[r^e] = r^e(P' - P),$$

Date	ΔP
September 27	N/A
November 2	0.0428
November 16	0.0286
December 2	0.0316
December 15	0.0442
December 20	0.0065

Table (3) Change in average price of the bet "Will there be a corporate tax cut by March 31, 2018?" on each of the dates identified by Gaertner et al. [forthcoming]. Note that betting started on October 23, so there is no data in this series for September 27. The same date on the bet asking "Will there be a corporate tax cut by December 31, 2017?" yields a ΔP of 0.0397. December 2, 2017, the date on which the Senate passed the TCJA, was a Saturday. As a result, I effectively look at returns on the following Monday, December 4, 2017. The change in probability reported here is the sum of the changes between Saturday and Monday.

or, letting $\Delta P \equiv P' - P$,

$$\frac{\Delta \mathbb{E}_P[r^e]}{\Delta P} = r^e.$$

With this reasoning in mind, I run specification 3 allowing for the effect of each of the six dates considered to differ, and then I deflate the result for each date by the change in probability of a corporate tax cut on that date, as measured by the futures prices on PredictIt.org. These changes in probability are documented in Table 3.

Results are reported in Table 4. The impact of market capitalization, measured in billions of dollars, remains small even though I am restricting the sample to the top quartile of the market cap distribution, but again is likely to be the victim of attenuation bias. The impact of the Lerner index small, due to the major variation of the Lerner index in the data, as one can see in Table 6. For December 20, for instance, a one standard deviation change in Lerner index implies an increase in returns of 29.9 percentage points. Results for the HHI look even bigger in magnitude and statistically more significant. Compared to a firm in perfect competition, these results suggest that a monopolist gained between 5 and

	Market cap. $\times \ldots$	ΔP-weighted coefficient
Market Cap	November 2	0.027***
		(0.0016)
	November 16	0.0466***
		(0.0024)
	December 2	0.0106***
		(0.0021)
	December 15	0.0482***
		(0.0015)
	December 20	-0.0616***
		(0.0104)
	$HHI\times$ market share $\times \ldots$	
HHI	November 2	5.0879***
		(1.3257)
	November 16	13.2638***
		(1.9838)
	December 2	104.8466***
		(1.7951)
	December 15	22.4177***
		(1.2814)
	December 20	87.7112***
		(8.7725)
	Lerner index $\times \ldots$	
Lerner	November 2	0.0033***
		(0.0006)
	November 16	-0.0014
		(0.0008)
	December 2	-0.0017**
		(0.0008)
	December 15	0.005***
		(0.00055)***
	December 20	0.127***
		(0.0037)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table (4) Regression results of specification 3 disaggregated by date and re-weighted by ΔP. Raw regression results are reported in Appendix C. Note that date 1 is included in the analysis so as to not count it as a "control" day, but omitted in these results because there were no bets on that day in the betting series we are considering. Standard errors clustered by day in parentheses.

105 percentage points more due to the tax bill, depending on which date we consider – a large and somewhat puzzling range. Overall, the betting data help us see that there is a strong relationship between the gains from the tax bill and other traditional measures of profitability and market power, which in turn motivates the next empirical endeavor looking at the effects of the tax bill by individual firm.

Another interesting aspect of these results is how heterogeneous the measured effects are across the dates considered. Even excluding results for September 27, which would rely on a different betting series, there is considerable variation in the magnitudes of these coefficients. If all the information that was released during the dates this study focus on had to do with the probability of the bill passing, and not with different provisions and updated expectations of the bill, then we should observe roughly similar coefficients across each date after adjusting for the "size" of each event date.

One way to explain this variation is that different versions of the tax bill were being considered as time went on. This complicates interpretation, as it is far from trivial to predict what investors were and were not surprised by as new versions of the bill became available. In this sense, perhaps the last date under consideration, December 20, bears the cleanest identification argument – as the bill had undergone major changes which were by then established, and it was merely being sent for signature by the President, which happened two days later. Taking this argument to its extreme conclusion implies very large effects of market power and profitability on excess returns due to the tax cut.

5.4 The Distribution of Excess Returns

This section studies how the excess returns due to the news of the tax bill varied across individual companies. The procedure simply models the abnormal returns associated with our dates of interest to differ by each firm individually through the following fixed-effects model:

$$R_{i,t} - R^f_t = \eta_i + \omega_i TCJADates_t + u_{i,t}. \tag{4}$$

In this specification, η_i represents the average excess return of firm i on days other than the six dates of interest, and $omega_i$ represents the average difference in firm i's returns on those dates. While this model allows estimating the effects of the news firm by firm, it forgoes controlling for a number of forces that we were instead able to control for in previous work.

The fixed-effects model exhibits two main differences compared to the differences in differences specification of section 5.2. First, as section 5.1 discusses, the total impact of the bill is bound to include effects on aggregate quantities such as the market return. The identifying assumption while using abnormal returns, then, was that the parameters governing asset pricing did not change upon news of the tax bill. In order to take the same approach while measuring the total effect of the news, we'd need to know what the effect of the tax bill was on the risk factors affecting asset pricing. For this reason, this section instead opts to look at the effect on raw excess returns instead, and simply controlling for the average return η_i.

Second, this model cannot control for time fixed effects. Section 5.2 was purely interested in how the returns of companies with different measures M_i reacted differently to news of the tax bill, which meant that all identifying variation for the coefficient of interest was coming from variation across firms. Now that we are interested in the effect of the news *for each firm*, instead, all the identifying variation comes from differences for a given firm across time.

One downside of this approach is that it cannot separately control for how variables concerning firms' foreign operations interact with news about the tax bill, as variables on foreign operations only vary cross-sectionally. This means that ω_i captures the average effect of the tax bill as a whole, not just the reduction in tax rates. One might think that this could mean results are driven by the international provisions of TCJA, but Wagner et al. [2018b] provide

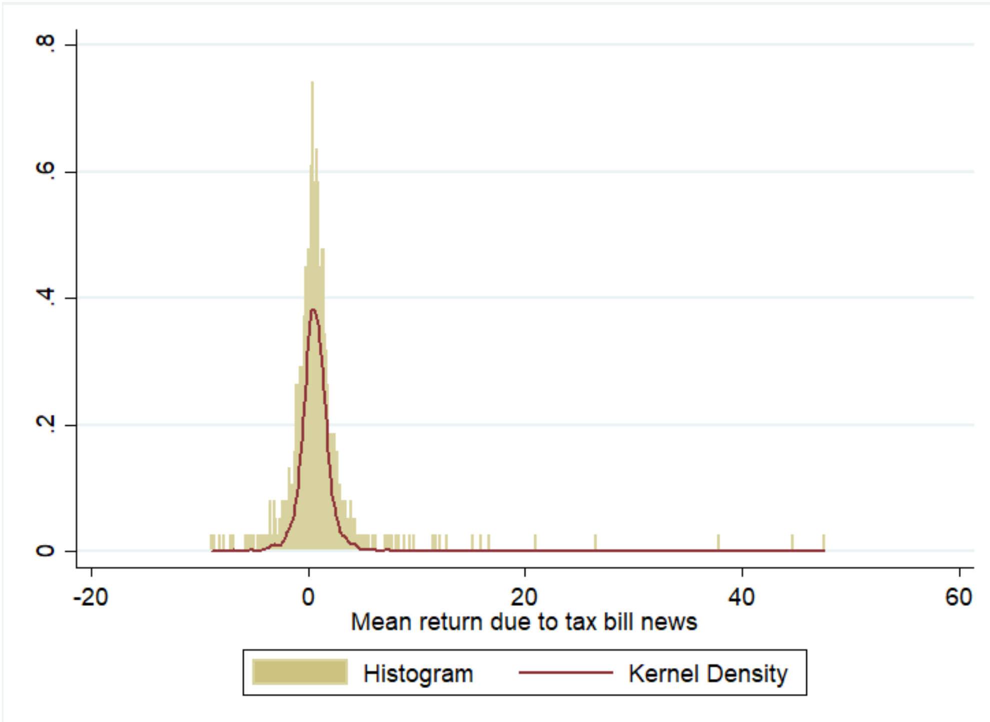

Figure (4) Distribution of average change in returns due to the news of the tax bill.

evidence that the proportion of income coming from abroad was not significantly correlated with excess returns on some of the dates we are considering, while it was negatively correlated in others. Rather than reflecting the overall provisions of the tax bill, thus, this is likely reflective of an increase in the repatriation tax rate, as the authors themselves point out. This significantly reduces worries that the results of specification 4 might be driven by differences in exposure to provisions on foreign income. Further, the empirical results of the previous section should reassure us that at least part of what is being measured has to do with differences in productivity and market power.

Results for specification 4 are plotted in Figure 4. The average increase in returns is concentrated around zero, but has a long right tail, which is consistent with the explanation regarding the increase in mark-ups and the concentration of market shares offered by De Loecker et al. [2018]. As Appendix G shows, this same distribution is not typical of most dates, and cannot be replicated by repeating the analysis with six dates chosen at random.

Weighing each date by the innovation in betting prices yields a clearer quantitative

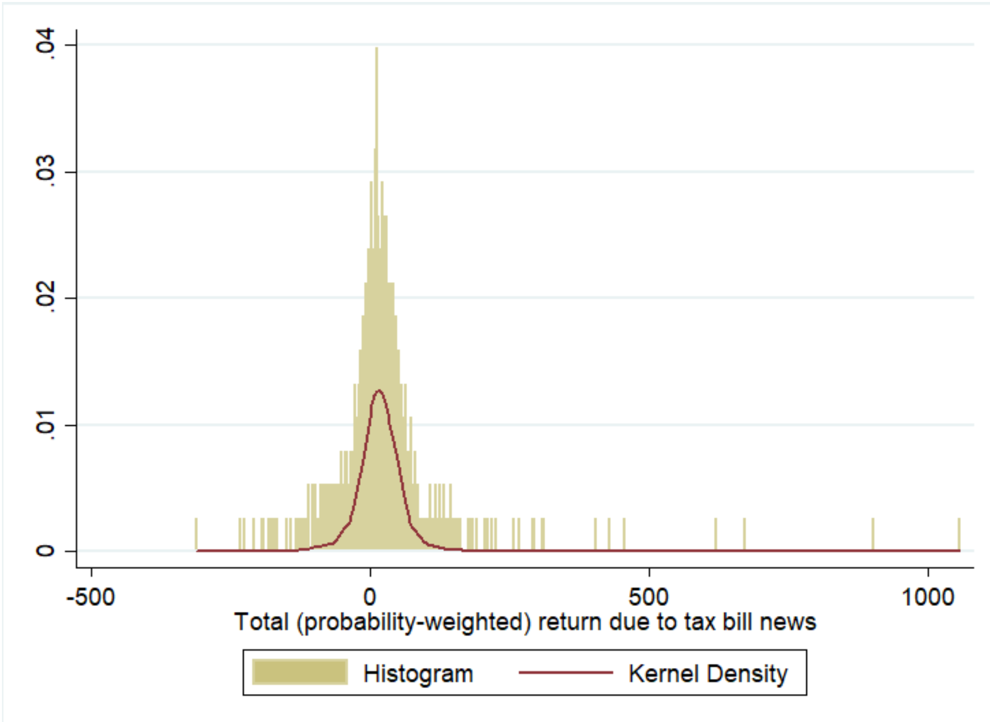

Figure (5) Distribution of the total change in excess returns due to the tax bill.

interpretation of the news on each day, similarly as in section 5.3. The dummy variable for each date of interest in $TCJADates_t$ is substituted with the change in odds on that date, and then equation 4 is estimated again. The resulting distribution of excess returns is shown in Figure 5. Figure 6 shows how the distribution of excess returns differed for more and less valuable companies. Companies higher up in the distribution of profitability, as measured by the Lerner index, were substantially more likely to experience a positive gain upon news of the tax bill than other companies. This complements the analysis in section 5.2, showing that smaller firms were not just more likely to have a smaller gains upon the the tax cut, but also that they were more likely to have no gain at all – which, in the language of equation 2, is what would not happen for a firm with no rents ($\Pi_{i2} = 0$) and facing immediate potential entry ($\alpha_i = 1$).

Multiplying the excess return estimated in this procedure with a firm's market capitalization, one can calculate the implied total effect of the tax bill on a firm's valuation. Since this calculation uses the market capitalization at the end of fiscal year 2016 avoid the

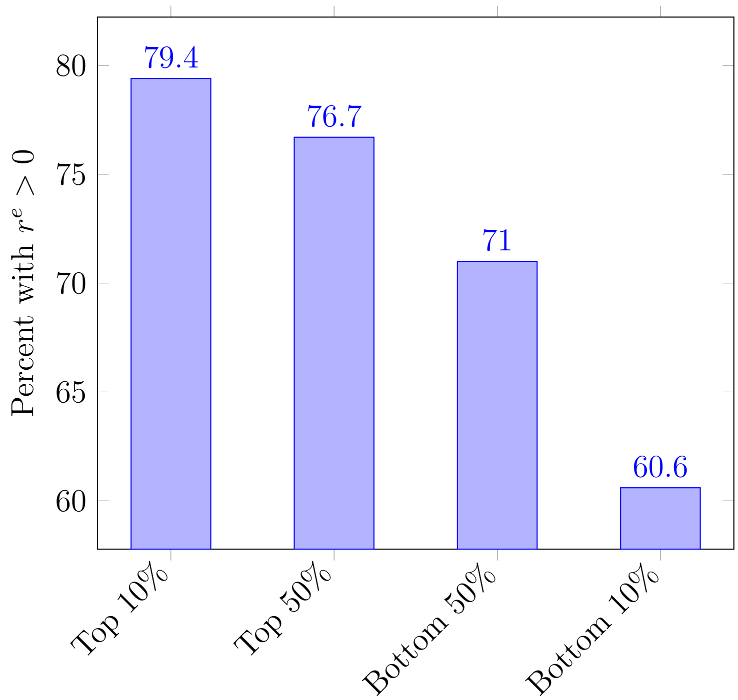

Figure (6) Percent of companies with positive excess returns upon news of the tax bill based on where they fall in the distribution of Lerner index.

possibility that considerations about the tax bill are already reflected in this market capitalization, the result can be thought of as a proxy for the real impact of the tax bill on the valuation of each firm. The resulting distribution of excess returns is reported for all firms in Figure 5, while the distribution of projected valuation gains (in billions of U.S. dollars) is reported in Figure 7. Again, the distribution exhibits a concentration around zero with a long right tail. A few well known companies where selected to showcase how much they gained from the bill.

These results should be interpreted with some caveats. For example, only 27% of the estimated excess returns are statistically distinguishable from zero at the 5% significance level. Furthermore, the median magnitude of the t-statistic for each ω_i is 1.17, indicating that many of these estimates have a high standard error relative to their point estimate. Finally, using market capitalization a year in advance means we can only proxy for the original value of each company.

With this in mind, Table 5 shows that not only did firms with a higher profit margin gain

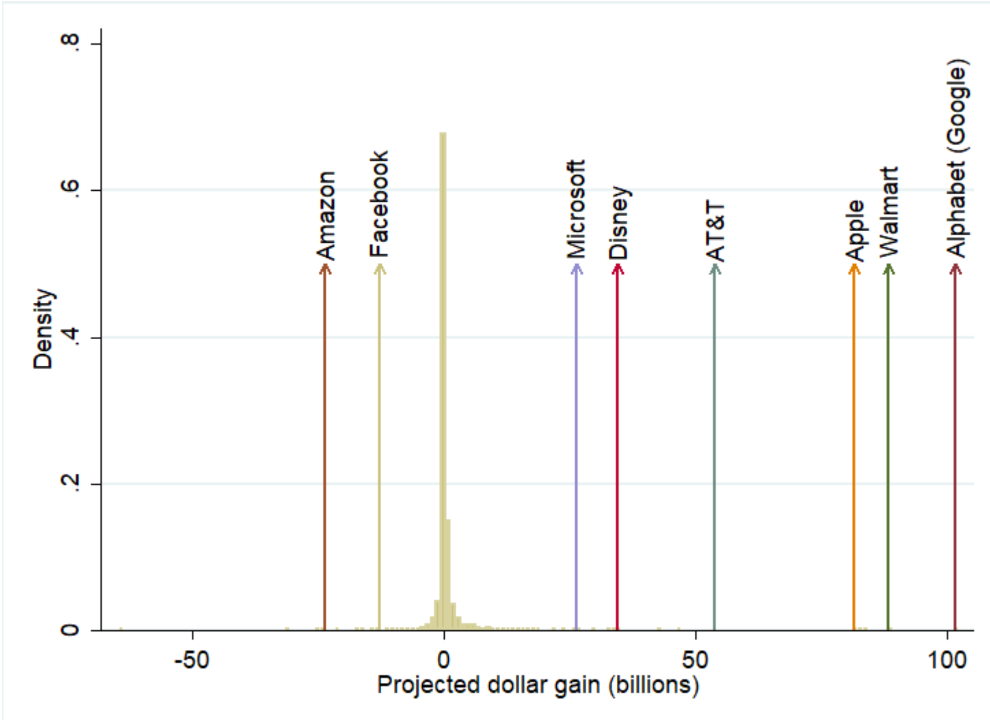

Figure (7) Distribution of the total dollar gain due to the tax bill for all firms.

Percentile of tax bill gain:	Top 1%	Top 5%	Top 10%	Top 25%	Top 50%	Top 75%
Percent of total market value	22.0	45.1	53.3	63.4	69.6	70.8
Percent of total projected gain	50.6	88.0	103.6	122.5	131.4	132.4
Lerner index percentile:	**Top 1%**	**Top 5%**	**Top 10%**	**Top 25%**	**Top 50%**	**Top 75%**
Percent of total market value	2.3	7.2	10.5	47.3	78.4	93.7
Percent of total projected gain	3.3	13.3	18.6	50.7	80.9	100.7

Table (5) Percent of total market value and percent of total gain from the tax reform for several percentiles of the distribution of the Lerner index and of dollar gains. Note that some groups may earn more than 100 percent of the gains because some firms are impacted negatively.

a bigger share of the gains from tax reform, but that they did so more than proportionally to their initial share of market capitalization. This evidence reinforces the interpretation that the heterogeneity in excess returns due to the tax cut was at least partly driven by differences in market power and the possibility of rent-eroding entry.

6 Conclusion

This paper studies how the market valuations of different U.S. publicly traded corporations were affected by news regarding an imminent tax cut. The results indicate that there was wide dispersion in the benefits of the tax cut. While the average impact was positive, some firms benefited little or not at all - indeed, roughly a quarter of firms lost value upon news of the tax cut - while others benefited a great deal. As noted in Table 5, these benefits were particularly concentrated among the most profitable firms. This heterogeneity is consistent with heterogeneity in the potential competition that a firm faces.

The paper further investigates the link between the excess returns due to news of the TCJA and market power. It finds that among the biggest firms, size is weakly correlated with larger excess returns. It also finds that a firm's excess return is positively related to its accounting profit margin and its market concentration. Using data from political betting markets, it becomes possible to assign cardinal interpretations to these estimates, which suggest sizable effects that are highly heterogeneous across dates. Using the date of last approval of the bill before it was signed into law, these results suggest that on average a monopolist earned an excess return 87.7 percentage points higher than a firm in perfect competition, and that moving up one standard deviation in the distribution of the Lerner index of firms was linked with an average increase of 29.9 percentage points.

This paper complements a growing literature documenting the rise of market power in the U.S. An analysis of forward-looking financial markets' response to tax cuts suggests that market expectations are consistent with the historical trend of a concentration of economic profit margins at the top of the distribution, in keeping with the evidence found in other parts of the literature. These results also contribute to the literature on corporate tax incidence. Responses to the tax cut are consistent with heterogeneous economic rents, and therefore with the notion that the shareholders of firms with high rents will bear much of the burden of corporate income tax.

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APPENDIX

A Theoretical Foundations

In the theoretical framework that lays the ground for my empirical analysis, firm i's value originates from two different sources, V_{i1} and V_{i2}. In what follows, I give an example of a setting that would generate such a scenario.

Let us begin begin with a simple model of Cournot oligopoly. There are N identical firms indexed by i, each producing quantity q_i. They face an inverse aggregate demand $p(Q)$, where $Q = \sum_{i=1}^{N} q_i$. Each firm picks how much to produce to maximize profits, taking the output of the other firms, $Q_{-i} = \sum_{j \neq i} q_j$, as given:

$$\max_{q_i \geq 0} (1-\tau)(p(q_i + Q_{-i})q_i - c(q_i)),$$

where $c(q_i)$ is the cost function and $\tau \in (0,1)$ is the corporate tax rate. Let $q^*(N)$ denote the Cournot-Nash equilibrium of this game, and respectively define equilibrium pre-tax profits $\pi(N) \equiv p(Nq^*(N))q^*(N) - c(q^*(N))$. Now let us imagine an infinitely repeated version of the same game. Since $q^*(N)$ is the equilibrium of the stage-game, it must also be an equilibrium of the repeated game, so assume that firms simply play $q^*(N)$ every period. If future earnings are discounted at rate r, then the equilibrium value of a firm is, at any point in time, $\frac{(1-\tau)\pi(N)}{r}$.

Now imagine that each firm operates in two unrelated markets, each a copy of the one described above. In the first market, new firms can enter as long as they pay an entry cost c_e. The number of firms in the first market, N_1, must then satisfy the condition

$$\frac{(1-\tau)\pi(N_1)}{r} = c_e.$$

This condition implicitly defines the equilibrium number of firms, $N_1(\tau)$. Letting V_1 denote the value of the firm's operations in the first market, we therefore have that in equilibrium

$$V_1(\tau, N_1) = V_1\big(\tau, N_1(\tau)\big) = \frac{(1-\tau)\pi\big(N_1(\tau)\big)}{r} = c_e.$$

Since c_e is an exogenous constant, this makes it immediately evident that V_1 will not change upon a change in τ – in the language of section 3, we are in a case where $\alpha = 1$. We could also imagine a version of this same model where entry is limited. Say, for example, as long as $\frac{(1-\tau)\pi(N_1)}{r} > c_e$, one firm can enter every period. Depending on the length of the period and the discounting between periods, we will obtain positive values of α: the longer each entrant has to wait, and the more valued the present is relative to the future, the higher the implied value of α.

In the second market, instead, let us suppose that the number of firms is given and constant at N_2, say thanks to the presence of intellectual property rights or licensing. Then the value of firm operations in this market are

$$V_2(\tau, N_2) = \frac{(1-\tau)\pi(N_2)}{r},$$

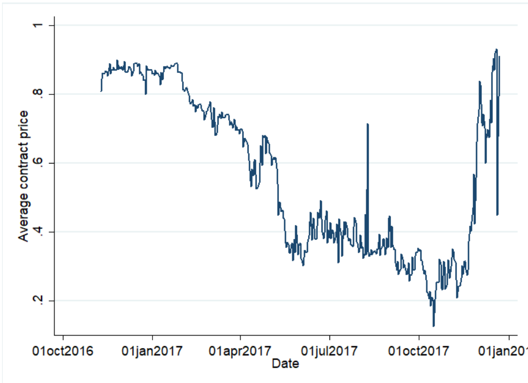
and after-tax profits go down one-for-one with quasi-rents upon a marginal increase in the tax:

$$\frac{\partial V_2}{\partial \tau} = -\frac{\pi(N_2)}{r}.$$

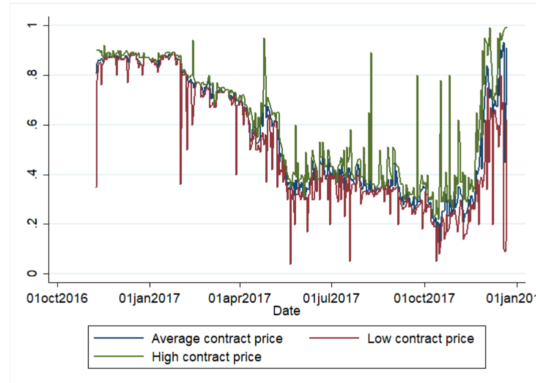
B Summary Statistics and Descriptive Graphs

Variable	Mean	S.D.	25th percentile	Median	75th percentile
Excess return (%)	0.09	3.53	-0.879	-0.001	0.969
Abnormal return (%)	0.009	3.49	-0.894	-0.019	0.813
Market Cap (billion USD)	6.54	26.33	0.15	0.76	3.188634
Lerner index (2016)	-10.74	235.7	-84.24	0.088	0.207
Market share (2016)	.018	.063	0.0001	0.001	0.009
Herfindahl index (2016)	.093	0.9	0.032	0.059	0.125
Proportion of foreign profits (2016)	0.137	2.499	0	0	0.06
$\bar{\tau}_i^{FOR}$ (2016)	0.072	1.34	0	0	0.01

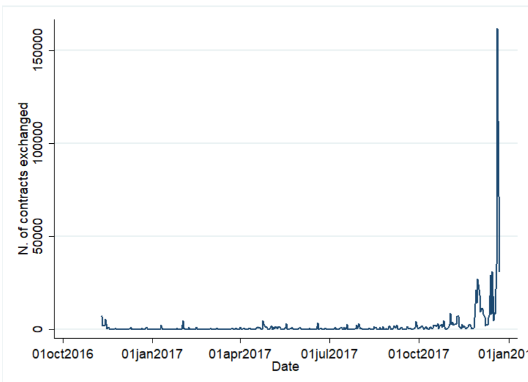
Table (6) Summary statistics of firm fundamentals. Note that the Lerner Index as well as the proportion of foreign profits and the average foreign tax rate can be negative because they are fractions whose numerator (and in some cases whose denominator) can be negative in the data. For instance, about a third of firms on Compustat report operating losses. The Lerner index will be negative for those firms.



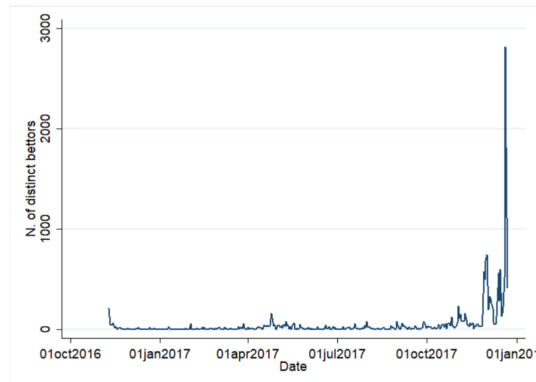
(a) Average price of a "Buy Yes" contract.



(b) Average, low, and high prices.



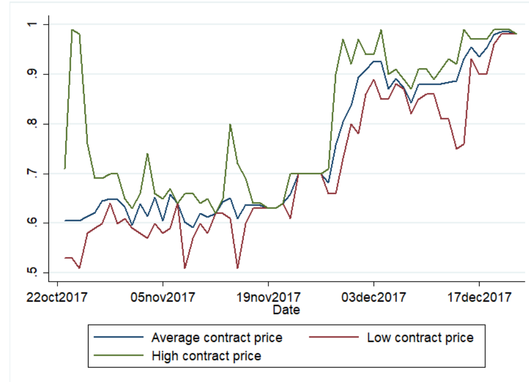
(c) Number of contracts exchanged.



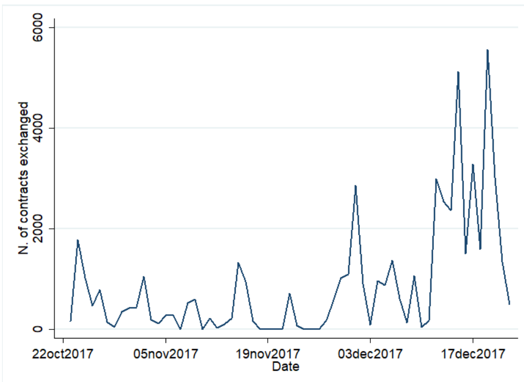
(d) Number of individual bettors.

Figure (8) Data on the bet asking "Will the corporate tax rate be cut by the end of 2017?"

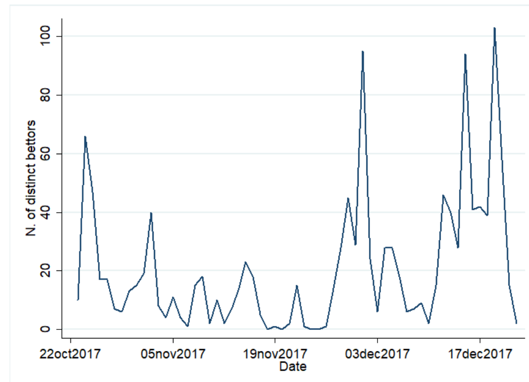
(a) Average price of a “Buy Yes” contract.



(b) Average, low, and high prices.



(c) Number of contracts exchanged.



(d) Number of individual bettors.

Figure (9) Data on the bet asking “Will the corporate tax rate be cut by March 31, 2018?”

C Date-by-date Results

	Dependent variable: abnormal returns		
	Coefficient estimate of:		
$\cdots \times \ldots$	Market Cap	HHI $\times$ s	Lerner
September 27	0.0032***	-0.0792	0.0006309***
	(0.00007)	(0.0567)	(.0000241)
November 2	0.0012***	0.2177***	0.0001389***
	(0.00007)	(0.0567)	(.0000241)
November 16	0.0013***	0.3791***	-0.0000397
	(0.00007)	(0.0567)	(.0000241)
December 2	0.0003***	3.3104***	-0.0000542**
	(0.00007)	(0.0566)	(.0000241)
December 15	0.0021***	0.9912***	0.0002194***
	(0.00007)	(0.0567)	(.0000241)
December 20	-0.0004***	0.5666***	0.0008203***
	(0.00007)	(0.0567)	(.0000241)
Time FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Foreign Profits Controls	Yes	Yes	Yes
N	296,437	1,274,778	1,166,039

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table (7) Each column corresponds to an estimation of equation 3 with each one of our three measures of productivity and market power, disaggregated by date. Standard errors, in parentheses, are clustered by day.

D Alternative Asset Pricing Models

D.1 Raw Excess Returns

In this case, there is no asset model. Simply, $R_{i,t} - R_t^f$ replaces $AR_{i,t}$ in specification 3.

	Dependent Variable: Excess Returns	
	Herfindahl	Lerner
Market share	-0.0593	
	(0.163)	
$HHI \times$ market share	0.0834	
	(0.260)	
$HHI \times$ market share $\times TCJA\ dates$	0.383	
	(0.588)	
Lerner index		0.000000781
		(0.0000233)
Lerner index $\times TCJA\ dates$		0.000283**
		(0.000133)
Proportion of foreign profits	-0.00123	-0.00143*
	(0.000808)	(0.000806)
Proportion of foreign profits $\times TCJA\ dates$	-0.00810	-0.00820
	(0.00636)	(0.00609)
Avg. for. tax rate	-0.000776	-0.000865
	(0.00166)	(0.00164)
Avg. for. tax rate $\times TCJA\ dates$	0.0208	0.0216
	(0.0145)	(0.0139)
N	1,274,778	1,166,039
Industry FE	Yes	Yes
Time FE	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table (8) Continuous diff-in-diff regressions of raw excess returns. Standard errors, in parentheses, are clustered by day.

Table (9) Continuous diff-in-diff regressions of raw excess returns. Standard errors, in parentheses, are clustered by day.

	Dependent Variable: Abnormal Returns						
	All Firms	Quartile I	Quartile II	Quartile III	Quartile IV	Top decile	Top 1%
Market Cap.	-0.0000718	-0.388	0.0112	-0.0158*	-0.0000519	0.0000124	0.000195*
	(0.000168)	(0.434)	(0.0419)	(0.00924)	(0.000109)	(0.0000747)	(0.000106)
Market Cap. $\times TCJA\ dates$	-0.00269**	-4.995	-0.292	-0.137**	-0.000339	-0.000111	0.000370
	(0.00118)	(4.900)	(0.489)	(0.0689)	(0.000289)	(0.000297)	(0.001000)
Proportion of foreign profits	-0.00115	-0.000639	-0.000923	0.00120	-0.00235**	0.00218	-0.00755
	(0.000815)	(0.00227)	(0.00134)	(0.00226)	(0.00118)	(0.00237)	(0.0167)
Proportion of foreign profits $\times TCJA\ dates$	-0.00772	0.00864	-0.0215	-0.00344	0.00560	-0.0188	-0.164
	(0.00627)	(0.0113)	(0.0160)	(0.0201)	(0.00907)	(0.0364)	(0.182)
Avg. for. tax rate	-0.00142	0.000569	0.000371	-0.00519	-0.00434	-0.00634	0.0156
	(0.00166)	(0.00708)	(0.00192)	(0.00319)	(0.00507)	(0.00614)	(0.0446)
Avg. for. tax rate $\times TCJA\ dates$	0.0205	-0.0211	0.0333***	0.0132	0.0409*	0.0285	-0.0503
	(0.0146)	(0.0503)	(0.00991)	(0.0224)	(0.0231)	(0.0366)	(0.205)
N	112,6540	281,600	281,371	281,920	282,215	112,982	11,037
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

D.2 Market Model

Now, abnormal returns are being computed using the following asset pricing model:

$$R_{it} = \alpha_i + \beta_i R_t^m + \epsilon_i \tag{5}$$

	Dependent Variable: Abnormal Returns	
	Herfindahl	Lerner
Market share	-0.0245	
	(0.167)	
$HHI\times$ market share	0.0116	
	(0.266)	
$HHI\times$ market share $\times TCJA\ dates$	0.396	
	(0.585)	
Lerner index		-0.0000141
		(0.0000233)
Lerner index $\times TCJA\ dates$		0.000294**
		(0.000130)
Proportion of foreign profits	-0.000346	-0.000459
	(0.000815)	(0.000813)
Proportion of foreign profits $\times TCJA\ dates$	-0.00919	-0.00926
	(0.00595)	(0.00573)
Avg. for. tax rate	0.000338	0.000315
	(0.00165)	(0.00164)
Avg. for. tax rate $\times TCJA\ dates$	0.0195	0.0205
	(0.0139)	(0.0133)
N	1,274,778	1,166,039
Industry FE	Yes	Yes
Time FE	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table (10) Continuous diff-in-diff regressions of abnormal returns, computed using equation 5. Standard errors, in parentheses, are clustered by day.

Table (11) Continuous diff-in-diff regressions of abnormal returns, computed using equation 5. Standard errors, in parentheses, are clustered by day.

	Dependent Variable: Abnormal Returns						
	All Firms	Quartile I	Quartile II	Quartile III	Quartile IV	Top decile	Top 1%
Market Cap.	-0.000146	-0.766*	-0.0683	-0.0183*	-0.0000685	-0.0000252	0.0000562
	(0.000170)	(0.421)	(0.0425)	(0.00933)	(0.000102)	(0.0000715)	(0.000105)
Market Cap. $\times TCJA\ dates$	-0.00274**	-5.430	-0.429	-0.136**	-0.000145	-0.0000134	0.000215
	(0.00119)	(4.887)	(0.492)	(0.0689)	(0.000319)	(0.000341)	(0.000967)
Proportion of foreign profits	-0.000276	-0.000455	-0.000169	0.00241	0.000280	0.00289	0.0176
	(0.000822)	(0.00227)	(0.00134)	(0.00226)	(0.00114)	(0.00231)	(0.0166)
Proportion of foreign profits $\times TCJA\ dates$	-0.00867	0.00805	-0.0226	-0.00647	0.00728	-0.0192	-0.146
	(0.00592)	(0.0115)	(0.0158)	(0.0189)	(0.00935)	(0.0362)	(0.184)
Avg. for. tax rate	0.000183	0.00349	0.00194	-0.00296	0.000541	-0.00273	0.0494
	(0.00165)	(0.00711)	(0.00191)	(0.00318)	(0.00508)	(0.00611)	(0.0453)
Avg. for. tax rate $\times TCJA\ dates$	0.0192	-0.0276	0.0318**	0.0155	0.0511**	0.0417	-0.0950
	(0.0140)	(0.0471)	(0.00963)	(0.0232)	(0.0247)	(0.0343)	(0.228)
N	112,6540	281,600	281,371	281,920	282,215	112,982	11,037
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

D.3 Naked CAPM

Now, abnormal returns are being computed using the following asset pricing model:

$$R_{it} - R_t^f = \beta_i(R_t^m - R_t^f) + \epsilon_i \tag{6}$$

	Dependent Variable: Abnormal Returns	
	Herfindahl	Lerner
Market share	-0.189	
	(0.167)	
$HHI\times$ market share	0.274	
	(0.266)	
$HHI\times$ market share $\times TCJA\ dates$	0.396	
	(0.585)	
Lerner index		0.000000623
		(0.0000233)
Lerner index $\times TCJA\ dates$		0.000294**
		(0.000131)
Proportion of foreign profits	-0.00145*	-0.00168**
	(0.000814)	(0.000813)
Proportion of foreign profits $\times TCJA\ dates$	-0.00923	-0.00925
	(0.00596)	(0.00573)
Avg. for. tax rate	-0.00118	-0.00128
	(0.00165)	(0.00164)
Avg. for. tax rate $\times TCJA\ dates$	0.0194	0.0204
	(0.0139)	(0.0133)
N	1,274,778	1,166,039
Industry FE	Yes	Yes
Time FE	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table (12) Continuous diff-in-diff regressions of abnormal returns, computed using equation 6. Standard errors, in parentheses, are clustered by day.

Table (13) Continuous diff-in-diff regressions of abnormal returns, computed using equation 6. Standard errors, in parentheses, are clustered by day.

	Dependent Variable: Abnormal Returns						
	All Firms	Quartile I	Quartile II	Quartile III	Quartile IV	Top decile	Top 1%
Market Cap.	-0.0000938	-0.629	-0.0277	-0.0179*	0.0000115	0.0000644	0.000180*
	(0.000170)	(0.420)	(0.0425)	(0.00933)	(0.000102)	(0.0000715)	(0.000105)
Market Cap. $\times TCJA\ dates$	-0.00275**	-5.550	-0.433	-0.137**	-0.000146	-0.0000159	0.000213
	(0.00119)	(4.888)	(0.491)	(0.0689)	(0.000319)	(0.000340)	(0.000966)
Proportion of foreign profits	-0.00134	-0.000844	-0.00120	0.00111	-0.00181	0.00306	-0.00547
	(0.000821)	(0.00227)	(0.00134)	(0.00226)	(0.00114)	(0.00231)	(0.0166)
Proportion of foreign profits $\times TCJA\ dates$	-0.00870	0.00783	-0.0226	-0.00647	0.00731	-0.0193	-0.146
	(0.00593)	(0.0115)	(0.0158)	(0.0189)	(0.00935)	(0.0362)	(0.184)
Avg. for. tax rate	-0.00190	-0.000491	-0.000150	-0.00478	-0.00327	-0.00482	0.00376
	(0.00165)	(0.00711)	(0.00191)	(0.00318)	(0.00508)	(0.00611)	(0.0453)
Avg. for. tax rate $\times TCJA\ dates$	0.0192	-0.0276	0.0319**	0.0155	0.0515**	0.0418	-0.0937
	(0.0140)	(0.0472)	(0.00963)	(0.0232)	(0.0247)	(0.0343)	(0.227)
N	112,6540	281,600	281,371	281,920	282,215	112,982	11,037
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

D.4 5-Factor Fama-French Model

Now, abnormal returns are being computed using the following asset pricing model:

$$\begin{aligned} R_{i,t} - R_t^f = \beta_i^m (R_t^m - R_t^f) + \beta_i^{HML} HML_t \\ + \beta_i^{SMB} SMB_t + \beta_i^{RMW} RMW_t + \beta_i^{CMA} CMA_t + u_{i,t}, \end{aligned} \tag{7}$$

where the two additional factors RMW (Robust Minus Weak) and CMA (Conservative Minus Aggressive) represent respectively the premium on robust relative to weak operating profitability portfolios and the premium on conservative relative to aggressive investment portfolios.

	Dependent Variable: Abnormal Returns	
	Herfindahl	Lerner
Market share	-0.203*	
	(0.115)	
$HHI\times$ market share	0.297	
	(0.206)	
$HHI\times$ market share $\times TCJA\ dates$	0.403	
	(0.356)	
Lerner index		0.00000298
		(0.0000234)
Lerner index $\times TCJA\ dates$		0.000212
		(0.000176)
Proportion of foreign profits	-0.00156*	-0.00180**
	(0.000827)	(0.000825)
Proportion of foreign profits $\times TCJA\ dates$	-0.00667	-0.00654
	(0.00567)	(0.00541)
Avg. for. tax rate	-0.00111	-0.00124
	(0.00162)	(0.00161)
Avg. for. tax rate $\times TCJA\ dates$	0.0122	0.0143
	(0.0129)	(0.0125)
N	1,274,778	1,166,039
Industry FE	Yes	Yes
Time FE	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table (14) Continuous diff-in-diff regressions of abnormal returns, computed using equation 7. Standard errors, in parentheses, are clustered by day.

Table (15) Continuous diff-in-diff regressions of abnormal returns, computed using equation 7. Standard errors, in parentheses, are clustered by day.

	Dependent Variable: Abnormal Returns						
	All Firms	Quartile I	Quartile II	Quartile III	Quartile IV	Top decile	Top 1%
Market Cap.	-0.000239**	-0.636	-0.0394	-0.0167**	-0.000112*	-0.0000504	0.0000173
	(0.0000757)	(0.411)	(0.0457)	(0.00840)	(0.0000670)	(0.0000705)	(0.000137)
Market Cap. $\times TCJA\ dates$	-0.000708	-7.397	-0.809*	-0.0441	0.00116**	0.000462	0.000352
	(0.000497)	(4.852)	(0.445)	(0.0722)	(0.000427)	(0.000533)	(0.00101)
Proportion of foreign profits	-0.00145*	-0.000797	-0.00118	0.000763	-0.00197*	0.00208	-0.00347
	(0.000833)	(0.00229)	(0.00137)	(0.00230)	(0.00118)	(0.00229)	(0.0166)
Proportion of foreign profits $\times TCJA\ dates$	-0.00647	0.00947	-0.0211	-0.0133	0.0181**	-0.0245	-0.0532
	(0.00546)	(0.0116)	(0.0155)	(0.0214)	(0.00793)	(0.0290)	(0.178)
Avg. for. tax rate	-0.00184	0.000130	-0.00000613	-0.00470	-0.00374	-0.00520	-0.00856
	(0.00163)	(0.00714)	(0.00186)	(0.00320)	(0.00512)	(0.00609)	(0.0494)
Avg. for. tax rate $\times TCJA\ dates$	0.0117	-0.0496	0.0234**	0.0193	0.0621**	0.0428	-0.328**
	(0.0129)	(0.0422)	(0.00749)	(0.0226)	(0.0298)	(0.0352)	(0.164)
N	112,6540	281,600	281,371	281,920	282,215	112,982	11,037
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

E Robustness Checks Regarding Specification 3

E.1 "Parallel Trends"

In the absence of a subsample that is not affected by the corporate tax cut (which is, of course, impossible to obtain in a sample of publicly traded corporations) one cannot run a true parallel trends robustness test for the main diff-in-diff specification in equation 3. Instead, what follows shows that the coefficient on the interaction between different measures of M_i and each individual date tends to move with changes in the betting prices. Because stock market prices should follow a random walk, and because innovations in contract price should be exogenous, these results suggest that the results obtained using our 6 dates of interest are at least not entirely spurious.

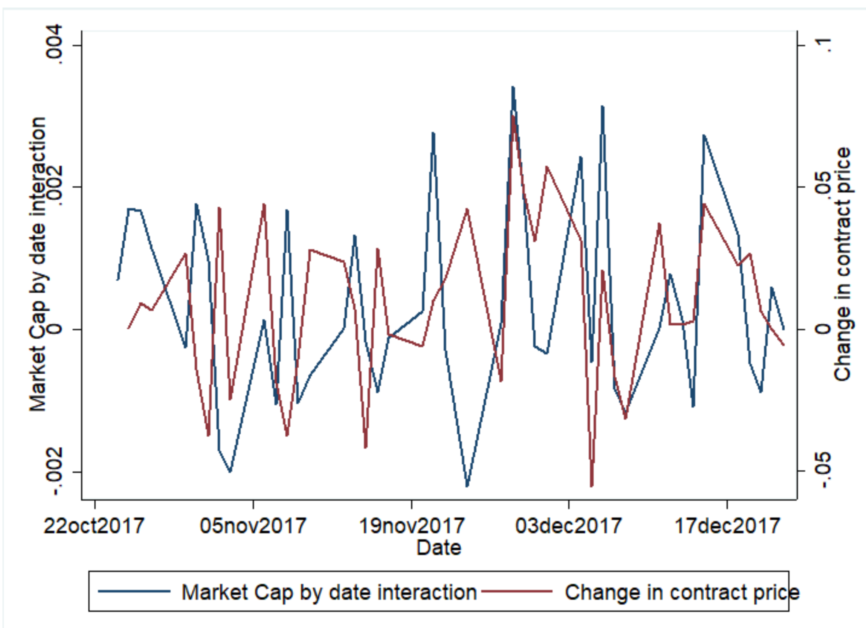


Figure (10) How the coefficient on Market Cap. and date dummies changes with ΔP. Correlation between the two series is 0.207.

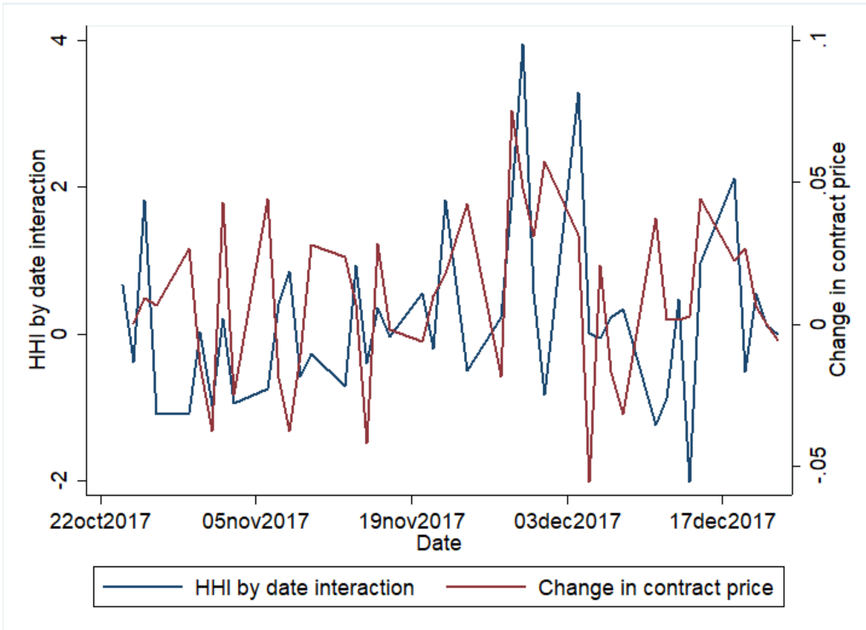


Figure (11) How the coefficient on $HHI \times s$ and date dummies changes with ΔP. Correlation between the two series is 0.2372.

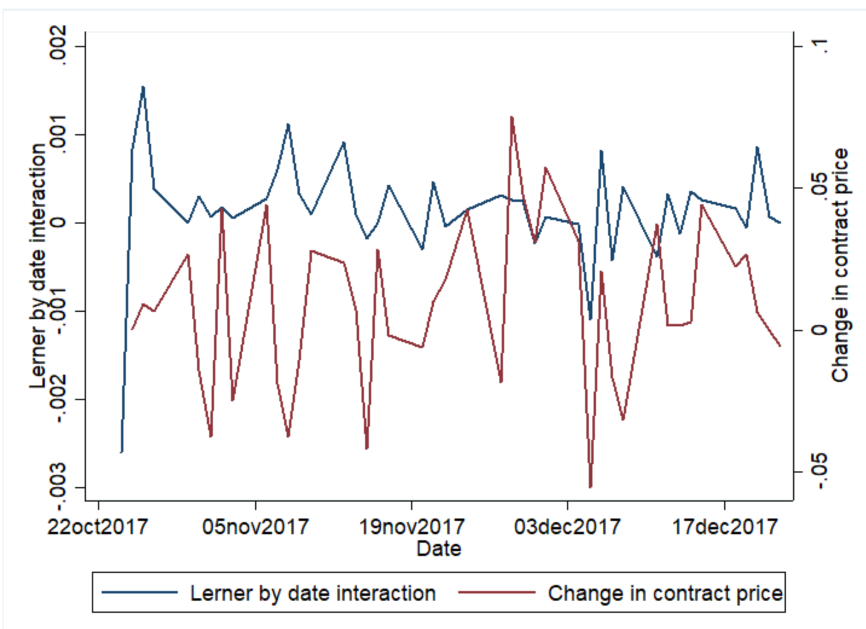


Figure (12) How the coefficient on L and date dummies changes with ΔP. Correlation between the two series is 0.0579.

E.2 No Industry Fixed Effects

Here I show results of specification 3 without industry fixed effects.

	Dependent Variable: Abnormal Returns	
	Herfindahl	Lerner
Market share	-0.187*	
	(0.113)	
$HHI\times$ market share	0.210	
	(0.129)	
$HHI\times$ market share $\times TCJA\ dates$	0.899*	
	(0.465)	
Lerner index		0.00000300
		(0.0000241)
Lerner index $\times TCJA\ dates$		0.000286**
		(0.000137)
Proportion of foreign profits	-0.00111	-0.00139*
	(0.000809)	(0.000802)
Proportion of foreign profits $\times TCJA\ dates$	-0.00604	-0.00557
	(0.00588)	(0.00575)
Avg. for. tax rate	-0.000613	-0.000835
	(0.00158)	(0.00157)
Avg. for. tax rate $\times TCJA\ dates$	0.0154	0.0173
	(0.0133)	(0.0127)
N	1,274,778	1,166,039
Industry FE	No	No
Time FE	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table (16) Continuous diff-in-diff regressions of abnormal returns, without industry fixed effects. Standard errors, in parentheses, are clustered by day.

Table (17) Continuous diff-in-diff regressions of abnormal returns, without industry fixed effects. Standard errors, in parentheses, are clustered by day.

	Dependent Variable: Abnormal Returns						
	All Firms	Quartile I	Quartile II	Quartile III	Quartile IV	Top decile	Top 1%
Market Cap.	-0.000143*	-0.545	-0.0363	-0.0229**	-0.00000487	0.00000741	0.0000354
	(0.0000732)	(0.417)	(0.0535)	(0.00829)	(0.0000672)	(0.0000709)	(0.0000909)
Market Cap. $\times TCJA\ dates$	0.000158	-7.992	-0.390	-0.0386	0.00130**	0.000752*	0.000560
	(0.000747)	(5.330)	(0.536)	(0.0593)	(0.000484)	(0.000424)	(0.000794)
Proportion of foreign profits	-0.00106	-0.000806	-0.00130	0.000626	-0.00116	0.00392	-0.00290
	(0.000811)	(0.00226)	(0.00134)	(0.00283)	(0.00113)	(0.00254)	(0.0188)
Proportion of foreign profits $\times TCJA\ dates$	-0.00556	0.0115	-0.0224	-0.0112	0.0170**	-0.0171	-0.0843
	(0.00578)	(0.0112)	(0.0155)	(0.0211)	(0.00829)	(0.0298)	(0.184)
Avg. for. tax rate	-0.00143	-0.000247	-0.0000341	-0.00410	0.00313	0.000273	-0.0482
	(0.00158)	(0.00696)	(0.00173)	(0.00320)	(0.00610)	(0.00718)	(0.0393)
Avg. for. tax rate $\times TCJA\ dates$	0.0153	-0.0490	0.0295**	0.0161	0.0674**	0.0394	-0.292
	(0.0136)	(0.0447)	(0.0107)	(0.0250)	(0.0250)	(0.0477)	(0.228)
N	1,126,540	266,018	279,477	284,891	296,437	119,008	12,452
Industry FE	No	No	No	No	No	No	No
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

F Hernfindahl-Hirschmann Index in Manufacturing

While the market shares (and resulting measurements of HHI) are computed using only Compustat data. This runs the risk of omitting potentially relevant competitors in each market which are not publicly traded and thus not on Compustat. The U.S. Census data provides concentration data by NAICS code, but unfortunately only for manufacturing sectors. If we repeat the analysis using these data, we obtain the following estimates:

	Dependent Variable: Abnormal Returns	
Market share	-0.0178	-0.00228
	(0.0179)	(0.00600)
$HHI\times$ market share	0.142	-0.000666
	(0.132)	(0.0389)
$HHI\times$ market share $\times TCJA\ dates$	0.116	0.119
	(0.202)	(0.202)
Proportion of foreign profits	-0.000481	-0.000828
	(0.00106)	(0.000994)
Proportion of foreign profits $\times TCJA\ dates$	-0.0114	-0.0114
	(0.0110)	(0.0110)
Avg. for. tax rate	-0.00222	-0.000856
	(0.00261)	(0.00257)
Avg. for. tax rate $\times TCJA\ dates$	0.0128	0.0121
	(0.0195)	(0.0196)
N	452,163	452,163
Industry FE	Yes	No
Time FE	Yes	Yes

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table (18) Continuous diff-in-diff regressions of abnormal returns. Market shares and HHI computed using Census data on the manufacturing sector. Standard errors, in parentheses, are clustered by day.

G Robustness Checks Regarding the Distribution of Excess Returns by Firm

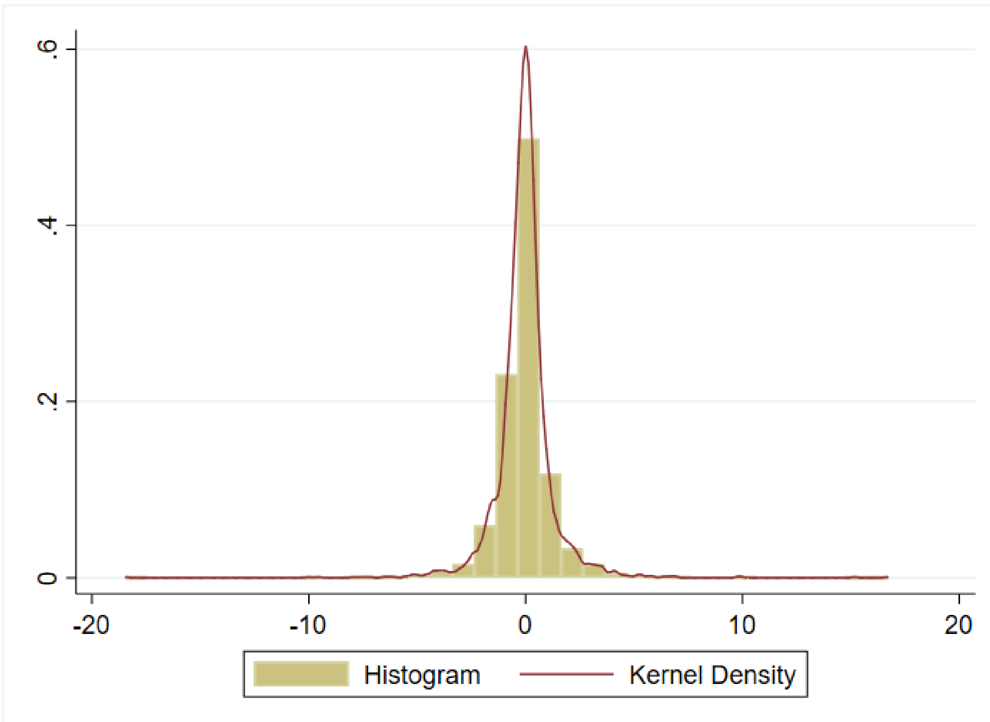


Figure (13) Distribution of excess returns due to six random dates aroung August 2017. The specific dates picked for this regression were July 31, 2017; August 8, 2017; August 16, 2017; August 23, 2017; August 25, 2017;and September 4, 2017.