Motivating Collusion*

Sangeun Ha **Fangyuan Ma** **Alminas Žaldokas**

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Abstract

We examine how executive compensation can be designed to motivate product market collusion. We look at the 2013 decision to close several regional offices of the Department of Justice, which lowered antitrust enforcement for firms located near these closed offices. We argue that this made collusion more appealing to the shareholders, and find that these firms increased the sensitivity of executive pay to local rivals' performance, consistent with rewarding the managers for colluding with them. The affected CEOs were also granted more equity compensation, which provides long-term incentives that could foster collusive arrangements.

Keywords: Product Market Collusion; Corporate Governance; Managerial Compensation

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*Sangeun Ha and Alminas Žaldokas are at the Hong Kong University of Science and Technology (HKUST). Fangyuan Ma is at the Peking University HSBC Business School. Emails: shaaa@connect.ust.hk; fangyuanma@phbs.pku.edu.cn; alminas@ust.hk. We thank Shashwat Alok, Aaron Barkley, Matt Bloomfield, Sudipto Dasgupta, Martijn Han, Amrita Nain, Vesa Pursiainen, Martin Schmalz, Giorgo Sertsios, Danny Sokol, Toni Whited, Lei Zhang, and the audiences at the AEA 2021, Barcelona GSE Summer Forum (Applied Industrial Organization) 2021, CUHK Greater Bay Conference 2021, MFA 2021, IIOC 2021, Finance, Organizations, and Markets Conference 2020, NYU Law/American Bar Association Next Generation Antitrust Scholars' Conference 2020, Finance in the Cloud IV, Asia-Pacific Corporate Finance Online Workshop, Corporate Finance Day 2020 (Liège), Paris Corporate Finance Webinar, Columbia Business School, HKUST, Fordham University, NUS, University of Technology Sydney, and University of Sydney for helpful comments. We also thank Alexander Blum and the undergraduate students in the HKUST UROP program for research assistance.

1 Introduction

Firm shareholders adopt various corporate governance mechanisms to motivate the management to pursue strategies that increase firm value. As posited by the industrial organization literature, entering into collusive arrangements with product market peers might be profitable to the firm's shareholders, depending on their discount factors, market conditions, and antitrust enforcement.[1] However, even when shareholders prefer the firm to cooperate with other firms, its management likely has different intrinsic incentives. In this case, a compensation contract can be used to align incentives and motivate collusion.

Several factors can drive a wedge between the management and the shareholders in their preferences for whether the firm should engage in product market collusion. For instance, executives in the U.S. are liable to criminal charges if the firm is convicted of explicit horizontal agreement conspiracies such as price fixing, bid rigging, or geographic market allocation.[2] Moreover, even absent antitrust enforcement, managers have career considerations and reputational concerns that further discourage collusion with other market participants. Both of these factors suggest that managers could have lower discount factors than anonymous marginal investors and are thus less intrinsically motivated to enter into collusive agreements.

In this paper, we study how CEO[3] compensation can be designed to encourage collusion, when antitrust enforcement is weakened and collusion becomes more appealing for the firm. Shareholders, and the board of directors on behalf of them, may choose to adopt certain features of compensation packages that discourage competition, so that collusive incentives

[1] Recent and ongoing U.S. antitrust investigations span different industries. For instance, the top executives of U.S. poultry firms were indicted for conspiracy to fix prices for the chicken sold to grocers and restaurants from 2012 to 2017; the former CEO of Bumble Bee Foods LLC was sentenced to three years in jail for conspiring to fix canned tuna prices; civil suits accused the four largest U.S. rail carriers of price-fixing conspiracy; Florida Cancer Specialists Research Institute paid a maximum statutory fine of $100m for agreeing not to compete with an oncology group in Collier, Lee, and Charlotte counties in Florida.

[2] Such criminal antitrust enforcement against individuals has been rising over time, see, e.g., Kades (2019). Although firms often indemnify their employees for the monetary fines, the financial reimbursement may not be as effective in the case of imprisonment, which imposes a large personal cost.

[3] We focus on the compensation of CEOs. As discussed by Harrington (2006), cartel decisions are typically taken by the top management to ensure the coordination at different layers of the organization (e.g., avoid "overzealous sales representatives" who might share information about the cartel with the firm's customers). Moreover, top executives' incentives are likely to trickle down to the incentives of middle management.

are provided to managers without giving any explicit instructions. This argument lead to the prediction that a weakening antitrust enforcement would affect the changes in the structure of managerial compensation in the direction of encouraging (or tolerating) less competition.

We focus on U.S. firms during 2008-2017 and look at a recent regulatory change that weakened enforcement of competition law for some firms in the U.S. The particular event that we study is the decision in 2013 to close down four regional offices of the Department of Justice (DoJ) Antitrust Division in Cleveland, Dallas, Atlanta, and Philadelphia. Among other responsibilities, these field offices were in charge of collecting information on potential conspiracies in the local product markets. In 2013, the decision was made to save costs and focus on larger firms in the economy by transferring the casework of these offices to the DoJ main headquarters in Washington, DC and the remaining regional offices.

We argue that this regulatory decision has contributed to a decrease in the monitoring of collusion in those local markets that were near the closed DoJ offices and further away from the remaining DoJ offices. As a result, firms that were operating in these markets experienced a sudden decrease in the probability of being detected in collusive arrangements with the local peers, making such collusive strategies more attractive to the shareholders. We study whether this regulatory decision has led to changes in some features of CEO compensation that can discourage competition or even foster explicit cartel arrangements.

Drawing from contracting theory, two types of incentive schemes stand out as likely to be relevant for managers' competitive incentives. First, CEO compensation is often linked to the performance of product market peers. When a CEO is rewarded based on outperforming these peers, the CEO's pay is negatively associated with their performance. However, when it benefits the shareholders to soften product market competition, the need to disincentivize competition tilts the optimal contract toward more positive loading on the peers' performance. As weaker antitrust enforcement makes collusion more appealing, shareholders can encourage softer competition through establishing a more positive link between CEO pay and peer performance.

We find strong evidence supporting this prediction by testing CEO pay sensitivity to the stock returns of their own firm and local peer firms. Firms located near the closed regional DoJ offices started having more positive CEO pay sensitivity to the performance of their local industry rivals. For a 100 miles' increase in firm's distance to its covering field office, the elasticity of CEO pay to local peer performance after office closure became more positive by 0.02. The change in pay sensitivity is likely driven by active adjustments of compensation schemes by the board. In particular, our result is stronger for cash than equity compensation, the former of which is more flexible and could be more quickly adjusted to the changing contracting environment.[4]

The second aspect of CEO incentives that we examine is the level of equity compensation. Awarding managers with stocks and options might not only align them with the shareholders but also lengthen their incentive horizon and stabilize collusive arrangements. Although a cartel is unstable in nature, a stock-holding manager may have low incentives to deviate from the cartel agreement, since stock prices of publicly listed firms may reflect the future losses from a punishment phase, thus limiting the gains from the deviation.

Consistent with this prediction, we find that the value of equity and option compensation increased significantly for the affected firms after 2013. The stock awards to CEOs increased by 0.53 basis points of the market capitalization for a firm with local peers when the distance to the new field office increased by 100 miles compared to the firms for which the covering field offices did not change or which did not have any local peers. We also find that the vesting horizon of new equity awards to the exposed firms' CEOs was extended to a greater degree after 2013 compared to the unexposed firms.

We further explore the heterogeneous impact on CEO compensation induced by the regulatory reform. We first show that our results are stronger among the firms that have better board governance. This suggests that the observed compensation changes are more likely

[4]Boards of directors have the discretion to implement and adjust CEO pay according to the realizations of own firm and peer firm performance, which is often referred to as *implicit* relative performance evaluation. They can also make *explicit* changes in the performance evaluation provisions listed in the incentive plans. We primarily find changes in *implicit* rather than *explicit* relative performance evaluation.

driven by shareholder value maximization rather than influenced by manager entrenchment.[5]

Moreover, we find that the effects are larger for the firms with more concentrated local operations, which arguably are more affected by the decline in local market monitoring from the antitrust authorities. Also, our results are stronger for firms in the concentrated industries, where collusion is more likely to take place since it is more feasible to coordinate among a limited number of players. In addition, we show that the results are stronger among the CEOs approaching retirement age, who are likely, absent equity incentives, to have a shorter-term focus and thus different preferences compared with shareholders. Finally, we find the effects are stronger for the firms in more flexible executive labor markets, where CEOs presumably have stronger reputation concerns.

Importantly, managerial compensation arrangements at the time of the policy reform are related to the changes in firms' operating performance that we capture by the gross profit margins. We find that the margins improved for the firms in the industries that were highly exposed to the reform and where most firms raised equity grants to their CEOs. In addition, these firms' stock returns started comoving more with the returns of their local product market peers, which is indicative of correlated operating performance. These trends are consistent with anti-competitive effects.

In this paper, we paint a grim view that shareholders might be interested in setting up the incentives to induce managers to pursue collusive strategies with their peers, and thus hurt consumer welfare. When doing so, shareholders as a group, or board members who represent them, are not giving direct instructions to collude and thus have plausible deniability that the incentive schemes do not reflect this particular product market strategy to maximize profits. In this way, they are not subject to personal antitrust liability.[6] Our findings raise a

[5]One alternative explanation of our findings is that the weakened antitrust enforcement alleviates managers' intrinsic aversion to collusion, so that they proactively pursue it and influence the board to adjust compensation structures in a way that reassures the other cartel members and fosters collusive arrangement. This subsample test suggests that such explanation is unlikely to be the main reason of our findings.

[6]Note that major shareholders might be criminally liable in the antitrust probes if they explicitly instruct CEOs to engage in the collusive schemes. A well-known case is an investigation into the alleged price-fixing between Sotheby's and Christie's where Sotheby's CEO Diana Brooks implicated Sotheby's shareholder A. Alfred Taubman. He was fined $7.5m and imprisoned for ten months. As cited by Bloomfield et al. (2020),

public policy dilemma. On the one hand, corporate governance standards require alignment between the incentives of investors and managers. On the other hand, if long-term investor behavior facilitates collusion, policies that care about consumer welfare might choose to encourage manager short-termism and thereby exacerbate the principal-agent problem if that has pro-competitive effects.

Our paper contributes to the literature on how incentive structures affect the strategic interaction of firms in the product market. Theory literature has recognized that the optimal incentive contract depends on both assumptions on the competition environment and restrictions on the contracting space.[7] We contribute by providing empirical evidence of how compensation design adapts to changing incentives in product markets. In particular, our paper establishes evidence that CEO compensation structure changes toward the direction of discouraging compensation when there is an exogenous decrease in antitrust enforcement. Our paper complements Anton et al. (2020) who show that CEOs are provided with weaker incentives when there is higher common ownership that favors less aggressive competition in the product markets.

In the studies on convicted cartels, González et al. (2019) and Bloomfield et al. (2020) find that the compensation structures of executives differ for the convicted cartel firms as compared to other firms. We instead focus on the changes in compensation structure around antitrust policy reforms that lower the costs of collusion.

Our paper is also closely related to the literature on relative performance evaluation. The principal-agent theories (e.g., Holmström (1979), Holmström (1982), and Nalebuff and Stiglitz (1983)) suggest that managers should be rewarded based on their performance rel-

the data from the European Commission suggests that in 35% of cases large shareholders know about their firms' cartel membership.

[7] Fershtman and Judd (1987) and Sklivas (1987) show that providing powerful incentives with a bonus scheme is optimal to achieve strategic advantages, while Reitman (1993) argues that stock options provide threats to rivals and thus can lead to a higher profit for shareholders. In a dynamic setting, Spagnolo (2000) shows that stock-based compensation helps to sustain collusion while deferred compensation even further increases the regions of collusive equilibria. Moreover, Spagnolo (2005) argues that compensation schemes with income-smoothing and capped bonus plans facilitate product market collusion. Abstracting from the incentive issues, Bernhardt and Chambers (2006) suggest that collusion is more likely when under uncertain demand firms choose to share profits with employees rather than pay fixed wages.

ative to that of their industry peers, which reflects the impact of common shocks to performance that are outside of managers' control.[8] While relative performance evaluation has been shown to create powerful incentives, it might also encourage over-aggressive competition. Aggarwal and Samwick (1999a) propose that when outputs are strategic complements, the optimal contract has a positive weight on the performance of both own firm and peer firms. They also empirically find that sensitivity of pay to peer performance is increasing in the degree of industry competition. Consistently, Joh (1999) finds that executive pay became positively related to peer performance in Japan when the government discouraged excessive competition. In contrast, Gong et al. (2011) find that firms are more likely to pay managers based on their out-performance of their peers in less concentrated industries.

Our paper contributes to this literature by showing that motivating collusion, a specific form of weakening competition, shapes relative performance evaluation. By relying on a shock to antitrust enforcement, we are able to identify the impact of the strategic weakening of competition on the sensitivity of CEO pay to the performance of the peer firms.

More broadly, we also relate to the literature on corporate misconduct such as money laundering, bribery, or breach of environmental standards (e.g., Agrawal et al. (1999); Zeume (2017)). Most of such misconduct likely benefits shareholders as their firm's profits, at least in the short term, are higher.[9] While some corporate governance implications of these types of corporate misconduct are similar to antitrust infringement, the features of executive compensation contracts that we study (i.e., relative performance compensation and equity compensation) particularly relate to the trade-offs in the product markets.

[8]Despite the compelling theoretical prediction, empirical evidence that managerial pay is negatively correlated with peer performance is rather mixed. See, e.g., Jensen and Murphy (1990), Gibbons and Murphy (1990), Antle and Smith (1986), Barro and Barro (1990), Janakiraman et al. (1992), Aggarwal and Samwick (1999b), and Jayaraman et al. (2020).

[9]That contrasts with insider trading, disclosure irregularities, and other managerial misconduct that executives perform at the expense of shareholders.

2 Data

We look at U.S. publicly listed firms[10] over 2008-2017. Our main data source for CEO compensation is Execucomp. We extract information such as total compensation, the value of stock and option compensation awards, and CEO ownership. We obtain performance benchmarking data from Incentive Lab. We complement the compensation data with stock returns from CRSP and financial data from Compustat. We extract board characteristics from Boardex and define the product market peers based on Hoberg and Phillips (2016). The data of convicted cartel cases are obtained from Connor (2014). State-level economic statistics are from the Census Bureau. Historical headquarter data come from SEC filings.

The information on the field offices comes from the DoJ Antitrust Division. In particular, we get the case coverage of all field offices before and after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia).

Table 1 reports descriptive statistics of our main variables that we discuss later after introducing our identification strategy.

3 Identification

Our identification strategy exploits a regulatory change that arguably made collusion in some markets a more appealing strategy for firms to follow. As we discuss further, the passage of the regulation was likely exogenous to the business environment faced by individual firms, and had direct effects on reducing antitrust convictions in the areas that were more exposed to the regulatory change.

[10]Collusion also involves privately held firms that might be subject to similar executive compensation considerations. However, as privately held firms are more likely to have concentrated ownership and lower agency conflicts, we believe the issues raised in this paper are less salient. In addition, the market values and often even operating performance of privately held firms are not observable, which would limit the applicability of the compensation mechanisms studied in this paper.

3.1 DoJ field office closures

We rely on the 2013 decision of DoJ that reduced firms' expected costs from antitrust investigation and thus changed their trade-off on whether to engage in collusive arrangements. In 2013, DoJ Antitrust Division closed down four of its seven regional offices (Atlanta, Cleveland, Dallas, and Philadelphia) that primarily dealt with criminal antitrust enforcement.[11] Some of the regional coverage was relocated to the three remaining field offices (Chicago, New York, and San Francisco) but most of it was moved to Washington, DC (Washington Criminal I and II). While this event came purely from the budget cuts, analysts considered that this made it harder for DoJ to police regional cases and instead, DoJ started focusing more on the big nation-wide cases.

The change in coverage affected 23 states and territories.[12] Figure 1 shows the number of antitrust case filings in the state courts where the original field offices were closed and the number of antitrust case filings in the unaffected states. We find that antitrust filings decreased sharply in the affected states since 2013, while there is no such trend in the unaffected states.

Moreover, we manually sort the cases by whether the alleged actions occurred locally, nationally, or internationally. We find that the drop in antitrust filings is driven by the local cases where the defendants are concentrated geographically rather than distributed across the nation or internationally. Table 3 reports the average number and proportion of local antitrust cases filed in the affected and unaffected states. We find that in the affected states the ratio of local cases over non-local cases decreased from 0.4 before 2013 to 0.12 after 2013. Instead, in the unaffected states, the ratio was at around 0.3 both before and after 2013.

[11] See Appendix A for the institutional background behind the office closures as well as media quotes with the reactions from policymakers and the antitrust community. Note that the closure of these offices should not have significantly affected merger review process that is typically conducted by the DoJ main office and the Federal Trade Commission (FTC). Empirically, we do not find a significant change in the merger activity by the affected firms, and these results are available upon request.

[12] The change affected all cases from Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, New Mexico, North Carolina, Ohio, Oklahoma, Pennsylvania, Puerto Rico, South Carolina, Tennessee, Texas, Virginia, West Virginia, and U.S. Virgin Islands. The change has also affected Eastern judicial district of Michigan and Southern New Jersey. See Table 2 for the field office breakdown.

3.2 Exposed firms

These statistics suggest that DoJ field office closures created a sudden decrease in antitrust enforcement in the local product markets. Since one of the duties of regional DoJ field offices is to source information on local market conspiracies, this regulatory change decreased the probability of detecting local market collusion among the firms for which the distance to their covering field office had increased.[13] We thus capture the exposure of a firm to this event by the change in distance ($\Delta Distance$) from the firm's headquarters to the covering DoJ field office, using the geographic coordinates based on zip codes. The average $\Delta Distance$ is 188.6 miles for all sample firms, including those that did not experience the change.

In addition, we focus on the firms with local peers, since the regional DoJ offices mainly monitor competition in the local market, while interstate collusion is less likely to be covered by the regional offices. We define local peers as the close rivals in the product market (with product similarity score within top 70% based on Hoberg and Phillips (2016) which is 0.1) and headquartered within 200 mile radius.[14] As shown in Table 1, the mean (median) firm has 3 (1) local peers and 16 (7) non-local peers. Table 1, Panel B shows the mean number of local and non-local peers in each industry.

Our *treated* group of firms is thus comprised of those firms that experienced an increase in distance[15] to the covering antitrust office and had local peer firms before the event. The *control* group of firms is then comprised of those firms that did not experience an increase in distance or did not have local peer firms. We will also use a continuous treatment variable to capture each firm's exposure to the DoJ office closures, denoted as *Exposure*, which equal to

[13] See Appendix A for the arguments mentioned in the media on why the supervision of local firms was expected to decrease. In addition, successful collusion cases often involve granting leniency to those former cartel members that volunteer information on the collusion. Local firms might be more willing to trust sharing such information in a more proximate office. In a similar context, banking literature has looked at whether the distance from the banks to the regulator, in particular, the change in distance to the regulator's closest field office, is related to the costs of monitoring and information frictions between regulators and banks. See, e.g., Wilson and Veuger (2017), Lim et al. (2017), Ganduri (2019), and Gopalan et al. (2019).

[14] Non-local peers are defined as the close rivals in product market (with product similarity score within top 70% based on Hoberg and Phillips (2016)) and headquartered outside 200 mile radius.

[15] In unreported tests we consider an increase in distance of at least 100 miles as the cut-off. The qualitative results do not change.

the $\Delta Distance$ when the firm had local peers in 2012 and zero otherwise. The median value of $\Delta Distance$ is 473 miles for the exposed firms. We use the term of *treated* and *exposed* (*control* and *unexposed*) interchangeably.

Table 4 compares exposed and unexposed firms in terms of observable characteristics. We also estimate a regression where the exposed dummy is regressed on the firm characteristics such as total executive compensation, firm return, peer firm return, size, sales growth, tenure, shares owned by CEO, net stock acquired by CEO, percentage of options granted, and the ratio of realized and intrinsic value of options. We find that none of the variables significantly explain the exposed dummy.

3.3 Pre-trends analysis

We first examine the economic conditions and competition environment of the states where the original DoJ field offices were closed and the other states. In Figure IA1, we plot the GDP growth, unemployment rate, and the growth rate of the total number of firms in the two groups of states. As we see from the figure, the trends of the two groups have been quite similar both before and after 2013. This alleviates the concern that affected and unaffected states have already been experiencing different economic conditions before 2013.

In addition to the economic conditions, in Figure IA1, we also study the trends in the competitive environment of the firms in the affected and unaffected states. In this regard, we construct several measures based on the Hoberg-Phillips similarity scores. In particular, we consider: a) the average similarity score of each firm's ten closest peers, b) the number of peers with similarity scores exceeding 0.1, and c) the number of local peers (headquartered within 200 miles) with similarity score exceeding 0.1. These measures reflect how similar firm's products are to their close peers. We find that none of the three measures present divergence between the affected and unaffected states before 2013.[16]

[16]In fact, after 2013 the firms in the affected states experienced a decrease in the number of local close peers and the average similarity of their products to the close peers. This pattern is consistent with that firms in the affected states could have begun to adopt strategies that reduce competition, i.e., they differentiated

4 Empirical results

We perform empirical analysis on whether the DoJ policy change of closing regional offices had an effect on the CEO compensation. Even with low antitrust enforcement, shareholder and managerial incentives to engage in long-term collusive arrangements could differ, among other reasons because managers have stronger career and reputation concerns as well as shorter horizons because of eventual retirement.

However, when shareholders' and managers' preferences diverge, shareholders can alter managerial incentives through certain types of compensation. First, they could tie the CEO compensation more positively to the peer firm performance (e.g., Aggarwal and Samwick (1999a)). Second, they could grant equity compensation to foster cartel arrangements (e.g., Spagnolo (2000)) and signal to peer firms their commitment to collusion (e.g., Bernhardt and Chambers (2006)).[17] We separately provide the results on the peer performance sensitivity and on equity compensation.

4.1 Ex post compensation: Peer-firm performance sensitivity

We first investigate whether the sensitivity of CEO pay to own-firm and peer-firm performance changes after the DoJ closed its regional offices in 2013. Theory literature discusses that rewarding CEOs based on their performance relative to that of peers can provide powerful incentives, since relative performance benchmarking filters out the common shocks to performance that are out of CEOs' control (e.g., Holmström (1982)). Empirical studies also provide supporting evidence that CEO pay is on average positively associated with own performance and negatively related to peer performance (e.g., Jayaraman et al. (2020)). On the other hand, some other studies point out that relative performance evaluation can encourage

themselves more from their close peers to avoid direct competition in the product market after 2013. Market division or customer allocation is one of the practices falling under common violations of Sherman Act.

[17] While these models are built for *tacit* collusion without antitrust enforcement and direct communication between the parties, whereas we assume that managers experience private cost of collusion, most of the intuition from these tacit collusion models should extend to the *explicit* collusion. We provide more discussion on these assumptions in Section 5.2.

over-aggressive strategies in the product market competition, which may reduce profitability and shareholder value (e.g., Aggarwal and Samwick (1999a)).

After the closure of the regional DoJ offices, the expected profits of collusion have increased for the shareholders.[18] If shareholders were interested in weakening product market competition, the firms should have reduced the use of relative performance evaluation, or even paid managers for better performance of the peer firms with whom they can collude. In other words, CEO compensation should have become more positively related to peer-firm performance, and especially with respect to local peers given that an important responsibility of the regional DoJ offices was to source information on the local market conspiracies and thus their closure could have increased collusion among the local firms.

One way to explore this prediction would be to examine the composition of performance peer groups that are reported in firms' proxy statements. However, firms do not always report the complete peer groups for performance benchmarking. In fact, less than half of our sample firms did so in 2013.[19] As pointed out by Jayaraman et al. (2020), even if firms do not disclose the peer groups explicitly, they may rely on implicit peer groups for performance evaluation, and peer firms with similar products are good proxies for the implicit peer groups. Therefore, we regard the firms in the same industries as the potential performance benchmark peers, and test whether CEO pay of the treated firms became more positively sensitive to the performance of peer firms located nearby, irrespective of whether they were mentioned explicitly in the compensation benchmark groups.

4.1.1 Baseline effect

We follow the empirical specification which has been widely used in studies on relative performance evaluation (e.g., Albuquerque (2009), Jayaraman et al. (2020)). We check

[18]The reform has also effectively reduced the expected punishment of individual managers. However, as they still remained criminally liable to the violation of Sherman's Act and in addition might have maintained reputation concerns, they might remain less inclined than the shareholders to participate in a cartel without additional incentives. Thus, compensation adjustments may be necessary to motivate collusion. We provide more discussion about these assumptions in Section 5.2.

[19]We provide more discussion on this in Section 4.1.4.

whether CEO compensation is sensitive to the performance of own-firm stock returns and local peer-firm stock returns. Following the literature, we focus on the stock returns as the measure of the firm performance, not least since stock returns take into account all future returns to the shareholders from the collusive schemes.

In particular, we are interested if the sensitivity to the stock price performance has changed after the closure of DoJ offices. We thus estimate the following difference-in-differences specification:

$$\begin{aligned} Ln(Compensation_{i,t}) = & \beta_1 \times \Delta Distance_i \times Post_t \times Ln(Return_{i,t}) + \\ & \beta_2 \times \Delta Distance_i \times Post_t \times Ln(Local\,Peer\,Return_{i,t}) + \\ & K_{i,t} + X_{i,t} + \tau_t + \gamma_i + \epsilon_{i,t} \end{aligned} \tag{1}$$

$Ln(Compensation_{i,t})$ refers to the natural logarithm of total compensation or certain component of CEO compensation. $Post_t$ refers to the post dummy which is equal to one for years on or after 2013. $\Delta Distance_i$ refers to the increase in geographical distance between headquarter of a firm and a governing antitrust field office after the event in 100-mile unit.[20] This variable is zero for the firms for which covering field offices does not change or the distance to new field office is shorter than before.[21]

$K_{i,t}$ refers stock return variables, i.e., $Ln(Return_{i,t})$ and $Ln(Local\,Peer\,Return_{i,t})$ and their interaction terms with $Post_t$ and $\Delta Distance_i$. Following the literature (e.g., Jayaraman et al. (2020)), we measure firm stock performance using the natural logarithm of one plus annual stock return. $Return_{i,t}$ refers to firm i's own stock market return in year t, and $Local\ Peer\ Return_{i,t}$ refers to average stock market return of local peers in year t, i.e., the firms with Hoberg-Phillips product similarity score within top 70% of firm i and headquartered within 200 miles from firm i.[22] $X_{i,t}$ refers to the control variables, including

[20] All our results are consistent if we use log transformation for the $\Delta Distance_i$ variable.

[21] Our sample has very few firms that became closer to a new field office.

[22] For firms with no local peers, $Local\ Peer\ Return_{i,t}$ is zero. We further include a dummy indicator for having any local peers in the regression.

all individual components of interaction terms, the indicator variable of having local peers ($Local\ Market_{i,t}$), its interaction terms with $Post_t$ and $\Delta Distance_i$, and the firm and CEO characteristics including firm size, sales growth, and CEO tenure. τ_t and γ_i refer to the year- and firm-fixed effects. Standard errors are clustered at the state level.

In this specification, the estimates of β_1 and β_2 reflect the treatment effects of the sensitivity of CEO pay to own-firm performance and to peer-firm performance, respectively. The closure of regional offices made it more appealing to collude with local peer firms. Since it benefits shareholders to discourage managers from outperforming the colluding peers, we expect that CEO pay became less negatively (or more positively) sensitive to peer performance. Also, since outputs in collusive equilibrium are strategic complementarities, under the optimal contract a more positive loading on peer firm performance should be associated with a less positive loading on own firm performance.[23] In other words, β_2 is expected to be positive while β_1 to be negative.

Table 5 shows the estimation results. We start with total compensation in columns (1)-(2). The coefficient of β_1 is negative (-0.02) and significant at 1% level. As the benchmark, an unexposed firm's pay-to-own-return sensitivity was 0.08 before 2013. More importantly, the coefficient of β_2 is positive (0.02) and significant at 1% level. As the benchmark, an unexposed firm's pay-to-peer-return sensitivity was close to zero (-0.01) and statistically insignificant before 2013, which means that a 1% increase in local peer's performance was associated with only 0.01% decrease in CEO total compensation. After 2013, the sensitivity for the unexposed firms became more negative by 0.06, although this change is again not different from zero from the statistical significance point of view.

To further interpret the point estimate of β_2 of 0.02 in economic terms, let us consider an exposed firm with the median level of increase in its distance to the field office, which is 473

[23]This point is demonstrated by Aggarwal and Samwick (1999a). That would also be consistent with Anton et al. (2020) who argue that when it is optimal for shareholders to discourage competition, CEOs should be provided less effort-inducing incentives, and that the wealth-to-own-firm-performance sensitivity should drop. However, unlike Anton et al. (2020) our main focus is the sensitivity of CEO incentives to *peer-firm* performance, and in particular new award grants in response to the antitrust policy change.

miles. For such a firm, the change of pay-to-peer-return sensitivity after 2013 has become more positive by 0.09, as compared to an unexposed firm, which means that a 1% increase in local peer's performance was associated with 0.09% increase in CEO total compensation.

While in column (1) of Table 5 we control for the firm and year fixed effects, column (2) additionally includes the year × SIC 2-digit industry fixed effects. In the latter specification, we are thus comparing treated and control firms in the same year and in the same industry, thus we take into account any common industry trends that could be related to the disincentives of competition. The coefficient of β_1 remains negative and statistically significant and the coefficient of β_2 remains positive and statistically significant. Additional fixed effects only slightly change the magnitude of the coefficients of interest.

Overall, this evidence supports the argument that firms adjust managerial compensation scheme to reflect shareholders' preference for softer competition. Lower expected antitrust enforcement against collusion reduced the incentives for the firms to outperform peer firms with whom they have a possibility of colluding in the product markets.

4.1.2 Discretionary compensation

We further examine whether the changes in pay-to-performance sensitivities can be attributed to the board's compensation decisions. An alternative explanation for the results in Table 5 is that the board did not adjust compensation in response to the event, while the CEOs of treated firms found collusion more attractive under their original compensation contracts. Reflecting higher profits, firms' equity value rose and stock grants became more valuable. Since stock prices co-move more in collusive equilibrium, we might mechanically observe greater sensitivity of equity compensation value to peer-performance even without boards actively adjusting compensation.

To rule out this possibility, we look at which component of compensation – cash or equity – drives the changes in pay-to-performance sensitivity. If the relationship appears mechanically, we expect to observe a greater increase in pay-to-performance sensitivity for

the equity component of CEO pay.

We further note that the value of cash compensation is subject to higher discretion from the board. Although discretionary compensation can be paid both in cash and equity (De Angelis and Grinstein, 2015), the cash component is generally more flexible to adjust as it often involves the board's judgment (Ma, 2020).[24] The board of directors can either include subjective performance metrics in the cash incentive plans, or grant non-plan-based cash bonus to managers under their discretion. If the board actively adapts contract design in response to the policy reform, we should expect a larger effect on the cash component of CEO compensation.

In Table 5, columns (3)-(4), we report the same specification as in columns (1)-(2) but here we have cash compensation as the outcome variable. In addition, in columns (5)-(6), we report these specifications where equity compensation[25] is the outcome variable. We find that the effect is indeed driven by the cash compensation, while the effect on equity compensation is not statistically significant. The result highlights that boards' discretionary practice plays an important role in adapting compensation to motivate collusion.

4.1.3 Active contract changes

We further investigate whether other features of cash incentive plans were actively adjusted in response to the DoJ office closures. In particular, we study the changes in performance metrics used to set own performance targets (i.e., not targets used to benchmark to the explicit peer groups) for cash incentive plans. We focus on three types of targets: "profit margin", "strategic goals", and "sales". We expect that if company goals shifted away from aggressive competition, profit margin should become more important in assessing CEO performance, while expanding output should become less encouraged. Few firms directly

[24]For instance, incentives plans often include qualitative performance measures such as "strategic goals" and the board has the discretion to determine whether the outcomes of such goals are met. In our sample, we see that 89.8% of the "strategic goals" appear as a performance measure in the cash incentive plans rather than in the equity plans. Appendix B lists a few examples of such "strategic goals" from DEF14A filings.

[25]Equity compensation is measured as the fair value of newly granted stock or option compensation of the year. The regression reflects the sensitivity of new equity granting value to the realized stock returns.

provide targets for output but we might expect some reduction in the targets based on sales that take into account both prices and output. We might also see an increase in less precisely measurable and thus more discretionary strategic achievements when determining pay amounts.

As shown in Table IA1, the performance measures of "profit margin" and "strategic goals" became more frequently adopted in determining the cash compensation for the treated firms after 2012, while "sales" was being used less frequently. Managers who experienced such changes in their performance evaluation functions were thus likely to focus more on retaining high profit margins or achieving strategic goals instead of expanding the firm's production. This evidence complements the results on pay-to-performance sensitivity by suggesting that boards made active adjustments to cash compensation and these adjustments were also consistent with higher collusive incentives.

4.1.4 Explicit peer groups

We next examine whether the changes in pay-to-performance sensitivity were driven by the removal of explicit relative performance benchmarks. We test whether treated firms changed their tendency of adopting explicit relative performance provision. As shown in Table IA2, we do not find such evidence of significant changes. One explanation for this could be that the majority of our sample firms with regional headquarters and local peers did not explicitly report relative performance peer groups in 2013 to start with.

In fact, we find that pay-to-performance sensitivity results in Table 5 are much stronger among the group of firms that did not report relative performance provisions in 2013. These results reported in Table IA3 suggest that it is the same set of firms that did not report the explicit performance benchmarks in 2013 and that made the sensitivity of CEO pay to local peers' performance more positive. This evidence implies that in terms of discouraging competition, implicit pay-to-performance sensitivity, which is largely under the board discretion, enhances the lack of explicit relative performance provision.

4.1.5 Robustness

Our baseline analysis reported in Table 5 links CEO compensation to the average performance of peer firms, controlling for the industry trends. We further perform the analysis at the firm-pair level and aim to control for the richer set of fixed effects and estimate the effects separately for the local and non-local peers.

In particular, at the firm-pair level, we are able to control for the pair-fixed effects, thus taking into account any non-time-varying relationship between the focal and the peer firms. With this set of fixed effects we are thus also controlling for non-time-varying geographic conditions such as local product and labor market effects. For instance, one might imagine that there could be differences in the relationships to peer performance sensitivity in rural areas and city locations.

In addition, we can control for the peer firm × year fixed effects and thus remove any particular time trends at the peer firm level. We adopt the following specification:

$$\begin{aligned} Ln(Compensation_{i,t}) = &\beta_1 \times \Delta Distance_i \times Post_t \times Ln(Peer\ Return_{i,j,t}) \times Local\ Dummy_{i,j,t} + \\ &\beta_2 \times \Delta Distance_i \times Post_t \times Ln(Peer\ Return_{i,j,t}) + \\ &X_{i,j,t} + \tau_t + \gamma_i + \eta_j + \epsilon_{i,t} \end{aligned} \tag{2}$$

We regress the natural logarithm of CEO compensation of firm i on the natural logarithm of firm i's stock returns and that of i's peer firm j, i.e., where firm j is defined as having the Hoberg-Phillips product similarity score within top 70%. $Local\ Dummy_{i,j,t}$ indicates that peer firm j is headquartered within 200 miles of focal firm i.[26] β_2 captures the changes in sensitivity of pay to peer performance induced by the event for both local and non-local peer firms. β_1 is of our most interest and reflects whether pay to peer performance became more sensitive to local peers as compared to peers in general. $X_{i,j,t}$ is the set of control variables

[26]Note that here $Local\ Dummy_{i,j,t}$ is defined at a firm-pair level based on whether the firms are local to each other, while $Local\ Market_{i,t}$ in the previous sections referred to whether the firm has any local peers.

including an extensive set of interaction terms, and firm and manager characteristics.

We report the specifications in Table 6. In column (1), we report the specification with year × SIC 2-digit industry (τ_t), focal firm (γ_i), and peer firm (η_j) fixed effects. In column (2), we report the specification with year × SIC 2-digit industry, focal firm, peer firm, and year × SIC 2-digit industry of peer firm ($\eta_{j,t}$) fixed effects. In column (3), we instead have pair ($\lambda_{i,j}$) fixed effects.

Across all specifications, we find β_2 to be negative and β_1 to be positive and of larger magnitude than β_2. This suggests that while CEO pay became even more negatively sensitive to the performance of non-local peers, the opposite holds for local peers. In other words, the increasing pay-to-peer-performance-sensitivity is concentrated with respect to the local peer firms where the incentives of collusion following DoJ changes became stronger.

In Table IA4, we estimate the specification (2) but we split the CEO compensation into the cash compensation and equity compensation. As before, we see that the effect is driven by the cash compensation which is more likely to be an outcome of adjusting compensation schemes. This further confirms that the change in peer performance sensitivity is not mechanical and is rather driven by boards making discretionary amendments to compensation.

Moreover, we perform several additional robustness checks for Table 5 by defining the peer groups differently. First, we separately look at the cases where we define peers as being classified in the same SIC 2-digit industry rather than according to Hoberg-Phillips classification. As peer locality might vary across industries, we also apply alternative definitions for the local peers, such as the firms headquartered in the same state, within 100 miles, and within 400 miles from the focal firms. We report these robustness checks in Table IA5.

Finally, when defining our local peers, we remove those peers that have an overlap with focal firms in terms of top five blockholders, where blockholders are defined as having more than 5% of stakes in firm's equity. These results, available at request, are consistent with Table 5, suggesting that we identify a different channel from common ownership which has also been shown to shape managerial incentives (Anton et al., 2020).

4.2 Ex ante compensation: Equity grants and vesting terms

We next examine equity compensation and vesting terms. As argued before, if the managers do not have the same preferences for collusion as the shareholders after the decrease in antitrust enforcement, their incentives can be aligned through stock and option awards. Moreover, since stock and option compensations are usually associated with restrictive periods that tie managerial payoff to firm's long-term stock returns, they effectively reduce managers' discount rate in their strategic interactions with competitors. Thus, equity compensation cuts managers' short-term incentives of deviating from collusive arrangement, making collusion more stable and sustainable (Spagnolo, 2000). Also, equity compensation, as a profit sharing scheme, can signal firm's commitment to collusion to the peer firms (Bernhardt and Chambers, 2006). In sum, we expect that it is in shareholders' best interest to grant more ex-ante equity compensation to CEOs in response to the reduction of local monitoring from DoJ and make them vest in a longer time period.

4.2.1 Equity compensation

We explore the changes in value of new equity awards to CEOs scaled by market capitalization.[27] We estimate regressions with the following specification:

$$Equity\ Compensation_{i,t} = \beta \times Exposure_i \times Post_t + X_{i,t} + \tau_t + \gamma_i + \epsilon_{i,t} \tag{3}$$

In this specification, $Exposure_i$ is a continuous variable that captures each firm's exposure to DoJ antitrust field office closures of firms that had local peers. Specifically, $Exposure_i = \Delta Distance_i$ if firm i had local peers in 2012 and $Exposure_i = 0$ if it had no local peers or experienced a non-positive change in distance to the covering DoJ office. $\Delta Distance_i$ and

[27] We scale by market capitalization to control for the potential increase in firm valuation following DoJ office closures. Since we intend to examine the changes in equity stakes driven by firms' compensation practice, we focus on the new grants instead of total equity holdings that also include the stakes obtained from previous years.

local peers have the same definitions as in the previous section. We further control for firm and manager characteristics and the firm and year fixed effects. If firms grant more equity compensation to encourage collusion, we expect the treatment effect β to be positive.

In Panel A of Table 7, we report the regression results of equity compensation. In column (1), we regress the value of new stock grants to CEOs scaled by market capitalization (multiplied by 10,000 and reported in basis points). We find that β is positive and statistically significant. In economic terms, the CEO's stock awards increased by an additional 0.53 basis points of the market capitalization, when its distance to the field office increased by 100 miles due to the office relocation. That suggests that the increase in CEO stock awards for an exposed firm with the median level of increase in its distance to the field office, which was 473 miles, amounted to 2.5 basis points of the firm's market capitalization. This magnitude is economically large, given that in 2012 the average stock grant ratio for the exposed firms in our sample was 9.1 basis points according to Table 4.

In column (2), we control for firm fixed effects and SIC 2-digit industry $\times$ year fixed effects that capture the potential time-varying industry-level shocks. In column (3) and (4), the dependent variable is the total value of stock and option grants (as basis points of market capitalization). We find that β is positive and significant across all specifications. The evidence suggests that equity compensation value increased to a significantly larger extent for the firms that had a greater exposure to regional DoJ office closures.

Notice that this test focuses on the level of equity grants rather than the sensitivity of equity compensation to stock returns that we study in the previous section. Taken together, both sets of results suggest that the firms affected by the reform granted more long-term equity plans to strengthen their managerial alignment, and at the same time, use discretionary cash bonuses to reward managers' special (and possibly one-shot) effort in adjusting the firm's strategic policies in the product market.

4.2.2 Vesting terms

Additionally, we study the vesting horizon of equity incentive plans. We first test whether the vesting period of new equity grants increased for the exposed firms after 2013. As shown in the Panel B of Table 7, we find that firms with greater exposure to the DoJ office closure were more likely to grant equity incentive plans that have vesting periods of longer than five years.[28] This is consistent with them extending managerial incentive horizon to foster collusive arrangements. In economic terms, the probability of having the vesting horizon longer than five years has increased by 0.3 percentage point, when the firm's distance to the field office increased by 100 miles due to the office closures. For an exposed firm with the median level of increase in its distance to the field office of 473 miles, the chance of granting such long-term stock plans increased by 1.4 percentage point. The magnitude is economically large, since in 2012 the probability for stock grants' vesting horizon to exceed five years was only 2.1 percentage among the exposed firms according to Table 4.

Furthermore, product market coordination might be best achieved with coordinated compensation schemes among the cartel members. In Table IA6, we find that after 2013 the firms with greater exposure to the regulatory change became more likely to grant equity plans with the vesting deadlines similar to those of their local peers (i.e., falling within a 6-month window). This is consistent with the argument that exposed local competitors adjusted their CEOs' compensation to achieve more aligned incentive horizons.

4.3 Heterogeneous effects

We next explore the heterogeneous impact of the DoJ regional office closures on compensation practices according to several firm characteristics and market conditions: geographical concentration of firm operations, market concentration of industry, board diligence, CEO age, and executive labor market mobility. We present the summary of the sample splits

[28] A median cartel lasts for five years (Connor, 2014).

for our main coefficients of interest in Table 8,[29] and report the full tables in Table IA7, Table IA8, Table IA9, and Table IA10. Panel A of Table 8 corresponds to Table 5, column (2), and Panel B corresponds to Table 7, column (2).

First, we investigate the board characteristics to understand the underlying channels for our baseline results. Our hypothesis is that after the antitrust policy reform, the board of directors adjusted CEO compensation on behalf of shareholders to promote collusive strategies in the product market. Alternatively, the CEOs might proactively choose to collude and influence the board to adjust their compensation contracts (González et al., 2019). The former argument would predict a stronger results among the firms with better corporate governance, while the latter suggests the opposite. We proxy board diligence by how busy the directors are based on the total number of the board positions in the other firms.[30] As argued by Fich and Shivdasani (2006), the firms with busy boards are associated with weak governance. We use Boardex dataset and split the sample based on each board's total directorships in other firms in 2012, and denote the firm as having a "busy board" ("less-busy board") if this number is higher (lower) than the median value of each firm-size tertile. We see that compensation changes are much more responsive among the firms whose board consists of less busy directors, which suggests that the observed compensation changes are more likely to be motivated by shareholder value maximization rather than influenced by manager entrenchment.

Second, we expect the effect to be stronger for firms that have their operations more concentrated geographically, i.e., firms that operate primarily in the local markets. For such firms, the closures of the field offices should be more relevant as compared to the firms with operations that are spread across the U.S. In particular, since the antitrust field offices are monitoring with the help of local knowledge, their closure should be more relevant for the local-level collusion. Therefore, the firms with significant local operations should be more

[29] We also report the tests for the differences in coefficients, which are broadly statistically significant at conventional levels.

[30] The results are qualitatively similar for other measures of board governance, such as the proportion of non-co-opted directors who are appointed before CEO assumed their position.

responsive to the change in the antitrust field offices.

We use two sources of data to estimate proxies for local operations. The first source is the Lexis Nexis Corporate Affiliations dataset on firm subsidiary locations, from which we estimate the geographic distribution of the firm's sales among the states where the subsidiaries and headquarters are located. In particular, for each firm we calculate the overall distribution of the firms' operations and estimate the sales concentration index (HHI) within firm. In this case, the firms are assigned as "concentrated" ("dispersed") if such an HHI index falls into the top (bottom) 30 percentile across all firms' HHI indices.

Given that subsidiaries might not fully represent firm operations, our second source is the number of states mentioned in 10Ks (Garcia and Norli, 2012).[31] Again, for each firm, we estimate the concentration index (HHI) of state mentions and assign firms as "concentrated" ("dispersed") if such HHI index falls into top (bottom) 30 percentile across all firms' HHI indices. Across both data sources and for both the peer-performance sensitivity and the equity compensation, the effects are larger for the firms with more concentrated operations.[32]

Third, we investigate the industry concentration. Since the coordination among a limited number of cartel members might be easier, firms in the concentrated industries are more likely to form collusive arrangements.[33] We expect that these firms are more likely to change CEO compensation scheme in response to the antitrust enforcement reform. To study this, we measure industry concentration by the revenue percentage of the eight largest firms in each NAICS industry, as reported by U.S. Census Bureau in 2012. Our sample is divided based on whether a firm is in an industry with the 8-firms' revenue percentage in the top or bottom quartile. We find that in the case of peer-performance sensitivity tests, our results are stronger for the firms in the more concentrated industries. That said, in the case of equity compensation, we see the presence of the significant effect across both subsamples.

[31] We take the last year of data in Garcia and Norli (2012), which for different firms is either 2007 or 2008.

[32] Our results are robust to measuring concentration by whether a firm has a large fraction of operations, either in terms of subsidiaries or 10K mentions, in a single state.

[33] Firms in concentrated industries with fewer symmetric players might find it easier to collude: Motta (2004) argues that this is the most important cross-sectional factor empirically predicting collusion, and Huck et al. (2004) provide supporting experimental evidence.

Fourth, we examine whether the changes in contract structure are more profound among the CEOs approaching retirement age. The retiring CEOs are likely to be more short-term oriented and less willing to participate in collusion at personal legal risks.[34] To provide incentives for collusion, the board of directors needs to adjust their compensation contracts. We split the sample by whether in 2012 the firm's CEO had more or less than ten years to the retirement age, which we consider to be at the age of 70. We document that our earlier findings on incremental peer performance sensitivity and equity compensation grants are concentrated in the subsample of CEOs closer to retirement.

Fifth, we study whether the adjustments in the compensation scheme are stronger for the firms that face more flexible executive labor markets. We posit that more flexible executive labor markets create higher reputational concerns for the CEOs since they might be poached by other corporations. As such reputation concerns could generate a larger wedge between managerial and shareholders' intrinsic incentives, we expect that compensation designs of CEOs in more flexible labor markets are more sensitive to the shareholders' expected payoff of motivating collusion. As a source of variation in the labor market flexibility, we look at whether the firms are located in the states with Inevitable Disclosure Doctrine (IDD). IDD prevents the firm's workers who have knowledge of its trade secrets from working for a rival firm (Klasa et al., 2018). As IDD limits the outside job opportunities of CEOs, we expect CEOs in the firms headquartered in the IDD states to have fewer reputational concerns in the external labor market, which should reduce the intention of the shareholders to adjust compensation scheme to motivate collusive behavior. To test this, we split the sample based on whether the courts of the state of firms' headquarter location recognized IDD or not in 2012. We find that the antitrust reform had a larger impact on CEO compensation schemes for the firms that are located in the states that did not recognize IDD in 2012.[35]

[34]The maximum imprisonment sentence has been raised from three to up to ten years by Antitrust Criminal Penalty Enhancement and Reform Act (ACPERA), which was adopted in 2004.

[35]Similarly, in the tests available on request we find that the effect is larger for the externally hired CEOs who are more likely to require extrinsic incentives to engage in product market collusion.

5 Discussion

In this section, we provide a discussion on the implications of our findings and additional robustness tests. First, we show evidence that the changes in the managerial compensation in response to the antitrust legal changes are associated with the increase in gross profit margins, suggesting that the firms which adapted managerial compensation experienced better profitability. Second, we provide a brief discussion of our underlying identifying assumptions. Third, we show that other economic trends unlikely confound our estimates. Finally, we provide additional evidence of the association between CEO compensation and cartel convictions.

5.1 Incentive alignment and firm outcomes

Successful coordination in product markets should be associated with larger markups and higher comovement of firms' product prices.

We now investigate whether firms' profitability changed in response to the DoJ office closures. We are particularly interested in the outcomes of industry equilibrium, and expect the profitability to increase in industries that were highly exposed to the regulatory reform. To test this, we measure each industry's exposure to the policy reform by taking the average of firm-level exposure as constructed in the previous sections. We compare the profitability of firms in the high exposure SIC 3-digit industries (i.e., the top tertile) with the low exposure industries (i.e., the the bottom tertile). In particular, we regress the gross margins on a set of interactions of year dummies and the dummy indicator of the highly exposed industries, controlling for firm and industry-year fixed effect at the SIC 2-digit level. The coefficients of the interaction terms are plotted in Figure 2 and regression result are reported in Table IA11. We find that after 2013, highly exposed industries started having significantly higher gross margins compared to those in the low-exposure industries. The evidence suggests that the reform might have had an anti-competitive effect.

Next, we examine whether the improvement in profitability is likely to be an outcome of local market interactions. In Table IA12, we report the number of local peers that experienced an increase (or decrease) in profitability during the period of 2013 to 2017 relative to the period of 2007 to 2012. We find that among the exposed firms that saw an increase in gross margins since 2013, there were on average twelve local peers whose margin also increased, but on average only one local peer that had a margin decrease. On the other hand, for the exposed firms that experienced a decrease in gross margin, there were on average four of their local peers whose margin also decreased, but only one local peer that had increased margin. The evidence supports the interpretation that local firms, when exposed to the DoJ office closures, have experienced changes in the gross margins that were congruous within the industry.

To understand whether CEO compensation contributed to the increased profitability, we now examine changes in gross profit margins in a triple difference-in-difference setting. We expect that the increase in profitability should be stronger in the industries in which many firms raised equity grants to their CEOs. We measure the average increase in equity compensation granted to the CEOs after 2013 in each SIC 3-digit industry, and estimate a regression with the following specification:

$$\begin{aligned} Profit\ Margin_{i,j,t} =& \beta_1 \times Post_t \times High\ Exposure_j \times High\ \Delta Equity\ Comp_j \\ &+ \beta_2 \times Post_t \times High\ Exposure_j + X_{i,t} + \tau_t + \gamma_i + \epsilon_{i,t} \end{aligned} \tag{4}$$

where for each firm i of industry j and year t, $Profit\ Margin_{i,j,t}$, corresponds to the gross profit margin, i.e., the gross profit over revenue. $Post_t$ is the dummy indicator for the years after 2013. $High\ Exposure_j$ is a dummy indicator equal to one for the SIC 3-digit industries that have the average exposure to the DoJ office closures in the top tertile among all the industries in 2013. $High\ \Delta Equity\ Comp_j$ is a dummy variable that equals to one if industry j's average change in stock (and option) grants to CEOs after 2013 is in the top tertile among all the industries. We control for firm characteristics, firm fixed effects, and the year-industry

fixed effects at the SIC 2-digit level. The estimate of β_1 captures the triple difference-in-difference effect comparing the industries with high exposure to DoJ office closures and high increase in equity compensation to the other industries.

As shown in columns (1)-(2) of Table 9 (Panel A), β_1 is positive and statistically significant, which suggests an improved profitability in response to DoJ office closure for the highly exposed industries where most firms raised equity compensation grants to their CEOs. On the other hand, β_2 is insignificant and close to zero, suggesting that gross margins did not increase if the industry did not see an increase in equity compensation grants.

Moreover, coordinated actions are likely to result in product prices changing in tandem, predicting greater comovement among the peer firms. We next study whether affected firms' performance started comoving more with the performance of their peers. As we do not have access to the product price data across different firms and industries, and so we do not have a way to capture high-frequency comovement of firm operating performance, we consider stock return comovement as its proxy. We estimate annual correlation of the firm's weekly stock price returns with each of its local peers, and take an average across the local peers. We again estimate the same specification as equation (4) but we use stock return comovement as the outcome variable.[36] We report results in Table 9, Panel A, columns (3)-(4), where we show that after the regulatory reform, such stock return comovement increased to a larger extent for the firms in the highly exposed industries that saw a great increase in equity compensation. This is consistent with the lower cost of collusion leading to more coordinated performance with the local product market peers.

In addition to industry-level exposure and changes in compensation that we use in Equation (4), we also perform tests where we measure exposure and changes in compensation at the firm level. In Panel B of Table 9, we report that we find similar results using firm-level exposure and increase in equity compensation.

Finally, since ex-ante we do not know which firms employ implicit relative valuation in

[36] As stock return comovement is only defined for firms that have local peers, the sample size is smaller.

their executive remuneration, we are not able to perform the corresponding tests that would map to our Table 5. However, in Table IA13, Panel A, columns (1)-(2), we link gross profit margin differences after 2013 to explicit relative performance evaluation provisions before 2013. Indeed, we find that the effect is concentrated among the firms that did not adopt explicit relative evaluation in 2012, i.e., they did not explicitly remunerate executives based on whether they outperform their peers. Moreover, in columns (3)-(6) we show that the results in Table 9 are also stronger in the subsample of firms that did not adopt explicit relative evaluation. In Table IA13, Panel B, we show corresponding results for the return comovement. These findings are consistent with the interpretation that firms without relative performance evaluation had the best improvement in their operating performance outcomes.

5.2 Identifying assumptions and treated observations

Two underlying assumptions in our identification strategy are that (a) there exists a wedge in the shareholders' and managerial intrinsic incentives to engage in product market collusion, and that (b) even if lower antitrust enforcement significantly increases the collusive incentives for the shareholders, such wedge with respect to managers' incentives still remains positive at least for some firms. Given the personal liability, reputation concerns, and career considerations, managers are likely to have lower *intrinsic* incentives to engage in product market collusion, as compared to the atomistic shareholders or even their corporate boards. Moreover, even if closures of DoJ regional offices could have shifted shareholder preference to engage in collusion over competition, at least some managers are likely to have remained cautious due to personal risks if no additional incentives were provided.[37]

More broadly, one could imagine an industry and legal environment that makes all four scenarios of discrete preferences for competition versus collusion possible: (A) both shareholders and managers prefer competition; (B) shareholders prefer collusion while managers

[37] We do not need to assume the wedge itself remained unchanged or got larger after the antitrust reform. Our argument holds even if the wedge shrank, as long as it remained positive. In other words, as long as the managers bore more personal risks than shareholders, additional incentives would be required to shift managerial preference from competition to collusion.

prefer competition; (C) managers prefer collusion while shareholders prefer competition; and (D) both managers and shareholders prefer collusion. We consider that (C) is the least likely scenario both before and after the antitrust reform since personal risks make collusion more costly for managers than shareholders.

Our identification thus captures those firms that were in the parameter region (A) before the antitrust change and that moved to the parameter region (B) because of antitrust enforcement changes (but before any changes to compensation contracts). This subset of firms ends up comprising our treated observations that respond to the treatment. As shareholders would be better off in region (D) compared with region (B),[38] it is optimal for them to change executive compensation contracts and provide *extrinsic* motivation for collusion.

However, some treated firms might move from parameter region (A) directly to region (D) even without the need to change executive compensation contracts. For instance, this could happen if the probability of collusion detection has dropped to close to zero after the reform. In other words, when the wedge between shareholders' and managers' preference becomes immaterial, there is no need to provide additional managerial incentives for collusion. These would be our exposed firms that did not respond to the treatment in terms of changing their compensation contracts but nevertheless had higher profit margins. Since our Table 9 shows that profit margin increase was primarily concentrated among firms that changed compensation, this subsample of firms should be a smaller fraction of our overall sample.

Another possibility is that some firms might already be in the parameter region (D) before the antitrust enforcement change, i.e., the shareholders of these firms prefer collusion even with higher antitrust enforcement and they had their managers aligned through extrinsic incentives. For these firms, weaker antitrust enforcement has lowered managerial personal costs and increased intrinsic incentives to engage in collusion, and so extrinsic incentives coming from adapted compensation contracts may no longer be necessary. In such a context, our findings might be interpreted as that we find more exposed firms in the parameter region

[38]Since managers are the decision makers, they would undertake competitive strategy in region (B) but collusive strategy in region (D).

(A) than in the region (D) before the antitrust enforcement changes, i.e., that pre-2013 local antitrust regional offices were in fact effective in constraining the collusion.

5.3 Confounding economic trends

One concern with our difference-in-differences setting is that the results may be driven by diverging trends that started in the period preceding 2013 regulatory change. Although in Figure IA1 we do not find evidence that the economic performance started diverging between states before 2013, we conduct further analysis to alleviate the concern. In particular, we conduct placebo tests by defining the post-shock period as the years after 2008, and adjusting sample period to 2003-2012, accordingly. We then perform the same estimations as in Table 5 and Table 7. In Table IA14 and Table IA15, respectively, we report these placebo test results. We do not find that the results are statistically significant if we consider a placebo year instead of the actual year when the antitrust field office reform was implemented.

Another concern might be that some other economic or policy changes occurred in 2013 and if our treatment variable is correlated with the exposure to such alternative shocks in 2013, we might be capturing that event instead of the DoJ field office closures. For instance, in Table 4 we see that our treated firms are on average larger, and one could be concerned that larger firms are disproportionately affected by some other event in 2013. For all our specifications we perform robustness tests where in addition to our treatment variables, we add interaction terms with all our control variables. Adding such interacted controls does not affect our coefficients of interest. These results are available at request.

5.4 Convicted cartels

In this last subsection, we provide additional evidence on the association between CEO compensation and collusive activities using a sample of convicted cartel cases. We obtain the information on U.S. cartel members and the starting time of their collusion from Connor (2014) and manually match them with stock return and CEO compensation data. We pair

up the member firms in each cartel and construct a panel of cartel pair-year observations. As shown in Panel A of Table 10, we find that although CEO pay is negatively associated with cartel peers' performance before collusion, the sensitivity has become more positive since the starting year of the cartels. The result is consistent after we control for the peer-firm or pair fixed effects. We also aggregate the stock returns of all the cartel peers for every firm in each year and find a consistent result.

The negative sensitivity of CEO pay to peer performance before collusion could reflect the existence of relative performance evaluation, i.e., awarding managers for outperforming peer firms. Such negative sensitivity disappears after collusion starts, suggesting the removal of cartel peers from the compensation benchmark groups. We further investigate whether this is the case using the compensation peer groups reported in firms' proxy statements that we obtain from Incentive Lab data.

Panel B of Table 10 shows the overlap between the peers that were convicted in the same collusion case and the peers mentioned in two compensation benchmark schemes: general compensation and relative performance evaluation. General compensation benchmark refers to the peer group companies that are picked to benchmark the overall compensation level for CEO and the other executives.[39] On the other hand, the relative performance evaluation benchmark refers to the peer firms whom the firm needs to outperform for the executives to be eligible for the relative performance awards. If the firm intends to collude in the product markets with the peer firms, such peer firms should not be included in the relative performance group, so that the executives do not have incentives to outperform them.

We manually name-match 416 firm-cartel-year observations from Connor (2014) to Incentive Lab database. With our matching, we also capture private firms and non-U.S. firms that might be included in the benchmark peer sets. Table 10 shows that in 20.67% cases at least one cartel peer is included in the general compensation peer benchmark, but only 10.1%

[39] Faulkender and Yang (2010) find that this compensation benchmark group appears to be comprised of highly paid peers that can be used to justify the general level of the CEO compensation. Bizjak et al. (2008) show that the general compensation group provides a benchmark for the overall pay level, which plays an important role in retaining valuable human capital.

cartel cases have at least one peer in the relative performance benchmark. This suggests that cartel peers overlap more with the benchmark firms in general compensation scheme than in relative performance evaluation scheme. If we consider the fraction of the cartel peers appearing in the benchmark sets, the respective averages are 7.8% for general compensation benchmark and 3.7% for relative performance benchmark. These differences between the two benchmark groups are statistically significant.

This finding is also consistent when instead of matching the firms in the actual period when cartel was active, we match in the entire period of sample. In this way we are able to match 497 cases, suggesting that in 81 cases (=497-416), the relative performance evaluation benchmarks are not available during the years when cartel is active but they are available in the other years. This is consistent with firms having less explicit performance evaluation with respect to the cartel peers during the active cartel years. In this entire sample, we see that in over half of the cases at least one cartel peer is included in the compensation peer benchmark and 20.25% of peers are mentioned at least in some year. In terms of relative performance benchmark the numbers are lower and a quarter of cartel members mention at least one of their peers and just 8.09% of peers are mentioned at least once.

6 Conclusion

In this paper we study the relationship between managerial incentives schemes and collusion in the product markets. We explore the decision by the DoJ to close down its four regional offices in 2013, which affected antitrust enforcement of regional collusion cases and thus made collusion a more attractive strategic choice to the affected firms' shareholders.

We study whether executive compensation contracts changed accordingly. First, we look at the relative performance evaluation, which is typically used to provide incentives for executives to outperform industry rivals. We find that affected firms reduced such incentives by tying CEO pay, especially the cash compensation, more positively to peer firm performance

after this regulatory change. Second, we argue that decision makers with shorter horizons might deviate from collusive arrangements, making them unstable. We find that after the closure of regional offices, the affected firms provided more equity, especially deferred equity, awards to the CEOs, which effectively extended the horizon of managerial contracts. Overall, the compensation practice after regional office closures is consistent with such a contract that grants managers a large equity stake upfront and in addition rewards them with a bonus if the board sees the actions taken in the product market favor collusion. The collusion-motivating contracts thus combine a component to make CEO's actions more long-termist (i.e., equity awards) as well as a component to link compensation to not outperforming peers (i.e., a discretionary cash bonus having a more positive sensitivity to peer performance).

Importantly, we see that these compensation changes were associated with changes in firm outcomes. Firms in industries with higher equity awards experienced better product market outcomes in terms of profitability, and also higher stock return comovement with the local product market peers.

Our results raise cautionary corporate governance implications. In the absence of antitrust enforcement, aligning investor and manager incentives might reduce consumer welfare. In addition, our results contribute to the debate on the optimal enforcement of competition law (Kaplow, 2011). The practice of sanctioning individuals in addition to the corporations exacerbates the principal-agent problem, increases the wedge between the shareholder interests and managerial incentives, and thus makes it more costly to close this wedge with extrinsic incentives. Finally, given that we document an increase in the gross profit margins of the firms exposed to the DoJ office closures, our results suggest the importance of having "boots on the ground" to provide local antitrust enforcement and are in line with the call in Bork (1978) to introduce more field offices.

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Appendices

A Institutional background

In this section, we briefly summarize the institutional background of the closure of four antitrust field offices based on the media reports and commentary from antitrust community.

The decision to close the field offices can be traced back to the efforts by President Barack Obama to make the Federal Government more efficient and effective. On June 10, 2010, President Obama signed a memorandum to dispose of unneeded federal real estate. The memorandum required government agents to cut no less than $3 billion worth of building costs by the end of the 2012 fiscal year. It also pointed out that the federal government was managing real estate more than it needs and thus wasting taxpayer dollars, energy, and water resources.[40]

In July 2010, under the leadership of the former Attorney General Eric H. Holder Jr, the DoJ launched Advisory Council for Savings and Efficiencies (SAVE Council). As part of the cost reduction plan, on October 5, 2011, DoJ announced that it will consolidate Antitrust Division field office space in Atlanta, Cleveland, Dallas, and Philadelphia into the Chicago, New York, and San Francisco field offices as well as the division's Washington, D.C.-based section. Annual savings of nearly $8 million were expected.[41] The plan was executed in January 28, 2013.

DoJ planned to reassign 94 lawyers to the remaining offices. It has put an argument that consolidating resources will also allow it to focus on large investigations. Assistant Attorney General Ronald Weich said that DoJ "wants larger concentrations of lawyers in fewer locations so it can investigate more sophisticated bid-rigging and price-fixing crimes."[42]

However, the decision was controversial as the government was criticized that it might not be able to keep its human capital with deep legal experience. According to Washington Post, "career antitrust lawyers affected by the plans said they were caught off guard, and they think the plans will result in de facto layoffs as colleagues decide to quit because they are unable or unwilling to move to another city."[43] Indeed, by early 2013, 14 out of 15 antitrust lawyers from Philadelphia office were out of the division, 10 of which have left the government.[44]

The decision has also met resistance among local politicians and antitrust lawyers. Cleveland mayor Frank Jackson argued that "Closing Cleveland's field office will ... impair the Department of Justice's ability to pursue effective criminal enforcement of antitrust laws."[45] One affected DoJ employee was quoted saying that "by closing both of the Southern offices, that population in the South has been abandoned, and much of the criminal enforcement program eroded."[46]

[40] obamawhitehouse.archives.gov
[41] www.justice.gov/opa/pr
[42] www.cleveland.com
[43] www.washingtonpost.com
[44] www.competitionpolicyinternational.com
[45] www.cleveland.com
[46] www.govexec.com

Similarly, in 2016, in his call to reopen field offices, Robert E. Connolly, an antitrust lawyer, has stated that "the strength of the field offices had always been their ability to network with investigative agencies from the FBI, the gamut of federal IG's offices, state and local prosecutors and public procurement officials. These local contacts were crucial to educating agents and purchasers about antitrust violations, and giving them the information needed (and motivation) to spot and report possible collusion."[47]

Even the lawyers from a private bar opposed the decision. An Atlanta-based attorney suggested that "antitrust lawyers based in the New York office are not going to go down to Alabama, and San Francisco isn't going to go down to Texas to work on a case, and someone from New York can't go down to a grand jury in Dallas and prevail. They just don't know the people and know how to do the cases."[48] Antitrust Attorney Joseph A. Tate said that many of his business clients were willing to speak openly with a well-known and trusted prosecutor, such as those in Philadelphia, than some "anonymous" person in Washington who "has not established a reputation for credibility."[49]

Further, the originally intended goal of achieving the cost effectiveness was also questioned. For example, Senator Bob Casey sent letter to Attorney General Eric H. Holder Jr urging to reconsider the decision. According to his letter, the DoJ was closing its offices "for an estimated savings of $8 million. However, the Philadelphia office alone has collected hundreds of millions of dollars through antitrust enforcement. In addition, the proposed relocation ... carries additional costs and, ... means higher locality pay."[50] Similarly, Rep. Hank Johnson Jr mentioned that the plan "puts nearly 100 jobs at risk in Atlanta and saves only $500,000 in fiscal year 2013", while Rep. Dennis Kucinich said that the Cleveland office generated criminal fines of $140.1 million, "[y]et the Cleveland Field Office's annual operating budget is just $3.2 million." Kucinich concluded that "it makes absolutely no sense to eviscerate this office's criminal enforcement efforts by disbanding the office for the mere perception of saving money on rent."[51]

Finally, this decision has been discussed to have had long-term consequences. In 2019, MLex, a media organization specializing on regulatory risk, discussed possible reasons for the limited number of recent prosecutions in criminal collusion cases by DoJ: "Some long-time criminal antitrust defense attorneys also suggested the string of closures could be a result of the relative inexperience of many of the antitrust division's criminal staff. In 2013, the antitrust division closed four of its so-called field offices ... Staff in those offices were offered positions in the remaining criminal units ... But over the past five years, the number of senior criminal antitrust prosecutors has continued to dwindle through retirements or individuals moving to private practice. ... As more senior criminal prosecutors have left, the division has hired a raft of new attorneys for the criminal program who don't have the same experience building and investigating cartel cases."[52]

[47] antitrustconnect.com
[48] www.washingtonpost.com
[49] www.mlexwatch.com
[50] www.casey.senate.gov
[51] www.saportareport.com
[52] www.mlexmarketinsight.com

B Examples of "strategic goals"

Firms often specify "strategic goals" as part of the subjective performance metrics. We collect a few examples of such "strategic goals" from firms' DEF14A filings:

- *strategic initiative goals are primarily related to key planned strategic actions, such as portfolio expansion, key R&D milestones, gross margin expansion, and entry into new markets.*
- *strategic planning to position us for long-term growth.*
- *enter into long-term contractual arrangements to secure revenue optimizing our balance sheet and capital allocation and managing risk.*
- *18 strategic goals in the following categories: (i) service excellence; (ii) safety and risk management; (iii) value pricing; (iv) profitable growth; (v) resource utilization; (vi) new energy environment; and (vii) employee engagement. // enterprise, legal, compliance and fraud risk assessments. // operating income, operating ratio, return on assets, safety, customer service, operating efficiency and other strategic goals.*
- *(xvi) the formation of joint ventures, research and development collaborations, marketing or customer service collaborations, or the completion of other corporate transactions intended to enhance the Company's revenue or profitability or expand its customer base.*
- *inventory management, growth in the channel market, gross margin and business velocity.*
- *focus executives on achieving results that contribute to continued long-term growth in stockholder value.*
- *capture pricing opportunities and improve financial position and prospects; improve succession planning and employee development; improve financial strength rating; enhance technology platforms.*
- *the Individual Strategic Goals identified for each executive officer included a mix of financial and operational, quantitative and qualitative factors. For fiscal 2015 these included but were not limited to: execution of the strategic plan; cost management, expense and pricing related goals; product development goals.*
- *the strategic objectives included but were not limited to emerging market growth, organic growth, and improving gross margins.*
- *produce long-term growth in revenue and earnings: A top priority is sustained profitable growth.*
- *the specific numbers used with regard to these goals (other than NOPAT less a capital charge) involve confidential trade secrets or confidential commercial or financial information, the disclosure of which would result in competitive harm.*
- *our compensation program is designed to align the interest of our executive officers with those of our stockholders through execution in three areas of strategic focus: growth and scale, operational excellence, and high performing organization.*

Table 1: Summary statistics

Panel A: Summary statistics

	N	Mean	S.D.	Q1	Median	Q3
ΔDistance	11,126	1.886	3.525	0.000	0.000	1.590
Ln(Return)	11,187	0.064	0.434	-0.109	0.111	0.300
Ln(Local peer return)	11,187	0.046	0.268	0.000	0.000	0.152
Ln(Total compensation)	11,187	8.218	1.042	7.578	8.315	8.931
Ln(Cash compensation)	11,187	7.327	1.089	6.854	7.403	7.933
Ln(Equity compensation)	11,187	6.559	2.961	6.328	7.587	8.412
Stock grants	11,186	9.77	19.60	0.00	3.62	10.5
Stock and option grants	11,186	14.00	24.7	2.05	6.56	15.7
Gross profit margin	12,662	0.427	0.235	0.245	0.381	0.595
Tobin's Q	11,990	1.805	1.189	1.068	1.403	2.057
Return comovement	7,246	0.439	0.203	0.293	0.447	0.594
Size	11,186	7.991	1.786	6.701	7.898	9.102
Sales growth	11,183	0.075	0.253	-0.028	0.05	0.138
Ln(Tenure)	11,187	1.797	0.896	1.099	1.946	2.485
Number of local peers	11,187	2.884	4.621	0	1	4
Number of non-local peers	11,187	16.03	21.190	2	7	21

Panel B: Industry average number of local and non-local peers

SIC (first digit)	Local peers	Non-local peers	% Local peers
0. Agriculture, Forestry and Fishing	0.205	0.051	0.875
1. Mining and Construction	3.613	12.746	0.233
2. Manufacturing	1.603	5.444	0.194
3. Manufacturing	1.729	5.475	0.239
4. Transportation, Communications, etc.	1.683	13.709	0.130
5. Wholesale and Retail	0.891	7.953	0.124
6. Finance, Insurance and Real Estate	4.213	27.791	0.167
7. Services	1.372	5.810	0.206
8. Services	1.560	10.334	0.180
9. Public Administration	1.200	6.220	0.159

Notes: ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 100 miles. Return refers to the annual stock market return of own firm, which is measured as combination of 12 monthly returns minus one. Local peer return refers to the average of annual stock return of local peer firms that are headquartered in 200 mile radius and have product similarity score within top 70% based on Hoberg and Phillips (2016). It is filled as zero if the firm had no local peers. Total compensation is the total of salary, bonus, non-equity incentive plan compensation, grant-date fair value of option awards, grant-date fair value of stock awards, deferred compensation earnings reported as compensation, and other compensation from Execucomp. Cash compensation is comprised of salary, bonus and non-equity incentive compensation. Equity compensation is comprised of grant-date fair value of option awards, grant-date fair value of stock awards. Stock (and option) grants refers to the fair value of stock (and option) grants scaled by the firm's market capitalization and multiplied by 10,000. The unit of compensation variables is thousand U.S. dollars. Gross profit margin refers to the gross profit divided by sales. Size is natural logarithm of one plus total assets (in million U.S. dollars). Sales growth is the annual percentage change in sales. Tenure is the number of years since the executive assumed their CEO position. Number of local (non-local) peers refer to the number of firms that are headquartered within (further than) 200 miles from the focal firm and have product similarity score within top 70% according to Hoberg and Phillips (2016). Percentage of local peers refers to the ratio of number of local peers and total number of peers. In all cases, "Ln" refers to natural logarithm of one plus the variable in parentheses. All the variables are winsorized at the 0.5% and 99.5% levels. Data spans from 2008 to 2017.

Table 2: States covered by antitrust division field offices

Field office	States covered by the field offices
Atlanta	Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico, U.S. Virgin Islands
Chicago	Colorado, Illinois, Indiana, Iowa, Kansas, West District of Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin
Cleveland	Kentucky, Eastern District of Michigan, Ohio, West Virginia
Dallas	Texas, Oklahoma, Louisiana, New Mexico, Arkansas
New York	Connecticut, Maine, Massachusetts, New Hampshire, Northern New Jersey, New York, Rhode Island, Vermont
Philadelphia	Delaware, Maryland, Southern New Jersey, Pennsylvania, Virginia
San Francisco	Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming

Notes: This table shows the state coverage of field offices in the U.S. Department of Justice Antitrust Division before the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 2013. This closure affected 23 states and territories. The data comes from Antitrust Division's April 2001 Report to the Chairman, Subcommittee on Administrative Oversight and the Courts, Committee on the Judiciary United States Senate, available at https://www.gao.gov/assets/240/231337.pdf.

Table 3: Trends in local antitrust cases

	Average local cases		Proportion of local cases over non-local cases	
	2008-2012	2013-2017	2008-2012	2013-2017
Affected states	1.522	0.565	0.402	0.125
Unaffected states	1.419	0.839	0.299	0.295

Notes: This table shows the local antitrust case filings and its proportion over the average of non-local cases during five years before and after the closure of four field offices in 2013. Affected states refer to 23 states and territories that were covered by closed four field offices: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Michigan (Eastern judicial district), Mississippi, New Jersey (Southern part), New Mexico, North Carolina, Ohio, Oklahoma, Pennsylvania, Puerto Rico, South Carolina, Tennessee, Texas, Virginia, West Virginia, and U.S. Virgin Islands. Unaffected states refer to the remaining 31 states and territories. Local cases refer to antitrust case filings of which convicted antitrust activities are limited to a certain U.S. region, i.e. they are neither national, nor international.

Table 4: Validity checks

	Unexposed	Exposed	Difference	(t-stat)
Ln(Total compensation)	8.252	8.196	0.057	(0.792)
Ln(Return)	0.140	0.141	-0.001	(-0.042)
Ln(Local peer return)	0.157	0.061	0.096***	(-7.933)
Stock grants	9.919	9.060	0.858	(0.710)
Stock and option grants	13.816	12.743	1.073	(0.714)
D[stock vesting horizon>5years]	0.025	0.021	0.004	(0.450)
D[stock and option vesting horizon>5years]	0.025	0.038	-0.013	(-0.801)
Size	8.342	7.978	0.364***	(3.027)
Sales growth	0.093	0.076	0.017	(1.191)
Ln(Tenure)	1.824	1.828	-0.004	(-0.072)
Gross profit margin	0.420	0.434	-0.015	(-0.902)
N	1,025	271		

Notes: This table shows the mean values of firm characteristics for the two groups of firms in 2012, before the field office closures. Exposed group refers to the firms whose distance from the headquarter to the governing antitrust field office increased in 2013 and who had local peer firms in 2012. Unexposed group refers to the firms whose distance to the governing antitrust office did not increase in 2013 or who had no local peer firms in 2012. Ln(Total compensation) refers to natural logarithm of one plus the total compensation from Execucomp (tdc1). Ln(Return) (Ln(Local peer return)) refers to natural logarithm of one plus annual stock market return of focal firm (local peer firms). We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Stock (and option) grants refers to the fair value of stock (and option) grants (in thousand U.S. dollars) scaled by the firm's market capitalization and multiplied by 10,000. Size is natural logarithm of one plus total assets (in million U.S. dollars). D[stock (and option) vesting horizon>5 years] refers to the average likelihood for the new stock (and option) grants to have more than 5 years' vesting horizon. Sales growth is the annual percentage change in sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. Gross profit margin refers to the ratio of gross profit and revenue. All the variables are winsorized at the 0.5% and 99.5% levels.

Table 5: Peer performance sensitivity

	Ln(Total compensation)		Ln(Cash compensation)		Ln(Equity compensation)	
ΔDistance x Post x Ln(Return)	-0.021***	-0.020***	-0.016***	-0.015***	-0.049*	-0.032
	(-5.577)	(-3.877)	(-3.334)	(-3.073)	(-1.718)	(-1.053)
ΔDistance x Post x Ln(Local peer return)	0.016*	0.021**	0.017**	0.018**	0.009	0.015
	(1.782)	(2.255)	(2.076)	(2.374)	(0.255)	(0.341)
ΔDistance x Post	0.006**	0.005*	0.005	0.006	0.019*	0.013
	(2.167)	(1.715)	(0.960)	(0.735)	(1.762)	(1.005)
Ln(Return)	0.089***	0.081***	0.170***	0.153***	-0.024	0.016
	(4.186)	(4.242)	(7.553)	(6.980)	(-0.219)	(0.155)
Ln(Local peer return)	-0.011	-0.011	0.039	0.036	-0.133	-0.152
	(-0.366)	(-0.329)	(1.028)	(1.115)	(-1.411)	(-1.343)
Local market	-0.032	-0.026	0.019	0.042	-0.137	-0.126
	(-1.089)	(-0.895)	(0.456)	(0.970)	(-1.511)	(-1.343)
ΔDistance x Ln(Return)	0.001	0.000	0.001	0.000	-0.000	-0.003
	(0.216)	(0.046)	(0.297)	(0.063)	(0.001)	(-0.096)
Post x Ln(Return)	0.185***	0.178***	0.252***	0.254***	0.343***	0.246**
	(7.198)	(7.025)	(6.726)	(7.247)	(3.517)	(2.183)
ΔDistance x Ln(Local peer return)	-0.003	-0.002	-0.017***	-0.017***	0.024	0.038
	(-0.529)	(-0.453)	(-2.689)	(-2.957)	(0.945)	(1.651)
Post x Ln(Local peer return)	-0.026	-0.060	-0.004	0.007	0.020	-0.163
	(-0.504)	(-1.155)	(-0.076)	(0.149)	(0.109)	(-0.925)
ΔDistance x Local market	0.008*	0.012***	0.004	0.009	-0.012	-0.002
	(1.726)	(2.835)	(0.587)	(1.667)	(-0.806)	(-0.148)
Post x Local market	0.035	0.024	0.076	0.046	0.034	-0.001
	(1.077)	(0.772)	(1.585)	(0.980)	(0.338)	(-0.016)
ΔDistance x Post x Local market	-0.008*	-0.008*	-0.008	-0.013*	-0.033**	-0.034*
	(-1.963)	(-1.792)	(-1.283)	(-1.966)	(-2.324)	(-1.967)
Size_{t-1}	0.253***	0.257***	0.098***	0.100***	0.595***	0.613***
	(11.338)	(11.125)	(3.426)	(3.179)	(7.400)	(6.788)
$\text{Sales growth}_{t-1}$	0.106***	0.088***	0.127***	0.100***	0.137	0.164
	(3.591)	(3.364)	(4.249)	(3.579)	(1.185)	(1.443)
Ln(Tenure)	0.040***	0.037***	0.073***	0.070***	-0.142***	-0.151***
	(3.741)	(3.278)	(6.205)	(4.846)	(-3.188)	(-3.063)
Constant	6.118***	6.090***	6.339***	6.322***	2.167***	2.046***
	(33.179)	(32.231)	(26.267)	(23.696)	(3.381)	(2.823)
Year FE	YES	NO	YES	NO	YES	NO
Firm FE	YES	YES	YES	YES	YES	YES
SIC2 x Year FE	NO	YES	NO	YES	NO	YES
Adjusted R^2	0.797	0.810	0.748	0.766	0.585	0.608
N	11,079	11,038	11,079	11,038	11,079	11,038

Notes: The dependent variables are natural logarithm of one plus total compensation, cash compensation, and equity compensation. Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 100 miles. Ln(Return) (Ln(Local peer return)) refers to natural logarithm of one plus annual stock market return of focal firm (local peer firms). Local market is an indicator for the presence of local peer firms. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Size is natural logarithm of one plus total assets (in million U.S. dollars). Sales growth is the annual percentage change in sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table 6: Pairwise specification

	Ln(Total compensation)		
ΔDistance x Post x Ln(Peer return) x Local dummy	0.024***	0.023***	0.027***
	(3.632)	(3.664)	(3.537)
ΔDistance x Post x Ln(Peer return)	-0.006	-0.005	-0.008*
	(-1.660)	(-1.538)	(-1.846)
Ln(Return)	0.104***	0.103***	0.094***
	(4.721)	(4.606)	(3.982)
Ln(Peer return)	-0.002	-0.006	-0.006
	(-0.530)	(-1.561)	(-1.324)
ΔDistance x Post	-0.003	-0.004	-0.004
	(-0.741)	(-0.799)	(-0.951)
Local dummy	-0.047	-0.049	-0.045
	(-1.059)	(-1.089)	(-1.079)
ΔDistance x Ln(Peer return)	-0.001	-0.001	-0.000
	(-0.663)	(-0.771)	(-0.293)
Post x Ln(Peer return)	0.011	0.017	0.017
	(0.999)	(1.636)	(1.396)
ΔDistance x Local dummy	0.005	0.005	0.005
	(1.107)	(1.177)	(1.211)
Post x Local dummy	0.011	0.010	-0.006
	(0.160)	(0.139)	(-0.087)
Ln(Peer return) x Local dummy	0.091**	0.092**	0.103**
	(2.079)	(2.155)	(2.070)
ΔDistance x Post x Local dummy	-0.001	-0.001	0.001
	(-0.144)	(-0.143)	(0.105)
ΔDistance x Ln(Peer return) x Local dummy	-0.009*	-0.009*	-0.012**
	(-1.847)	(-1.916)	(-2.134)
Post x Ln(Peer return) x Local dummy	-0.145***	-0.146***	-0.154**
	(-3.002)	(-3.026)	(-2.625)
Size_{t-1}	0.274***	0.274***	0.275***
	(7.693)	(7.573)	(7.260)
$\text{Sales growth}_{t-1}$	0.051	0.053	0.042
	(1.595)	(1.632)	(1.370)
Ln(Tenure)	0.034**	0.034**	0.034**
	(2.271)	(2.302)	(2.282)
Constant	5.712***	5.716***	5.692***
	(18.095)	(17.865)	(16.944)
Firm FE	YES	YES	YES
SIC2 x Year FE	YES	YES	YES
Peer FE	YES	YES	YES
Peer SIC2 x Year FE	NO	YES	YES
Pair FE	NO	NO	YES
Adjusted R^2	0.828	0.829	0.813
N	327,824	327,792	307,697

Notes: The dependent variable is natural logarithm of one plus total compensation. Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) divided by a 100. Ln(Return) (Ln(Peer return)) refers to natural logarithm of one plus annual stock market return of focal firm (Peer firms). Local dummy is an indicator for the presence of local peer firms under the definition above. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Size is natural logarithm of one plus total assets. Sales growth is the ratio of current year sales minus previous year sales and previous year sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. (Peer) SIC 2-digit x Year FE is joint fixed effect between year and industry with the SIC 2-digit code of (peer) firm. Pair FE is fixed effect for the pair of focal firm and a particular peer firm. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table 7: Equity compensation and vesting horizon

Panel A: Equity compensation

	Stock grants		Option and stock grants	
Exposure x Post	0.531***	0.352**	0.641***	0.311***
	(4.471)	(2.600)	(6.836)	(2.858)
$Size_{t-1}$	-0.458	-0.294	0.938	1.047
	(-0.453)	(-0.280)	(0.762)	(0.835)
Sales $growth_{t-1}$	-1.958*	-1.850*	-1.387	-1.047
	(-1.948)	(-1.785)	(-1.309)	(-0.971)
Ln(Tenure)	-0.960**	-0.934**	-1.585***	-1.526***
	(-2.203)	(-2.137)	(-3.049)	(-2.937)
Constant	15.016*	13.746	9.000	8.183
	(1.867)	(1.657)	(0.907)	(0.817)
Year FE	YES	NO	YES	NO
Firm FE	YES	YES	YES	YES
SIC2 x Year FE	NO	YES	NO	YES
Adjusted R^2	0.282	0.297	0.292	0.309
N	12,789	12,753	12,789	12,753

Panel B: Time horizon of equity compensation

	Over 5-year vesting period			
	Stock grants		Option and stock grants	
Exposure x Post	0.003**	0.003**	0.003**	0.003***
	(2.391)	(2.141)	(2.671)	(2.890)
$Size_{t-1}$	-0.008	-0.013	-0.007	-0.010
	(-0.741)	(-1.026)	(-0.711)	(-1.021)
Sales $growth_{t-1}$	-0.012	-0.004	-0.007	-0.010
	(-1.082)	(-0.345)	(-1.055)	(-0.810)
Ln(Tenure)	-0.013***	-0.011***	-0.012***	-0.011**
	(-3.226)	(-3.179)	(-2.848)	(-2.692)
Constant	0.123	0.160	0.109	0.136
	(1.183)	(1.415)	(1.310)	(1.570)
Year FE	YES	NO	YES	NO
Firm FE	YES	YES	YES	YES
SIC2 x Year FE	NO	YES	NO	YES
Adjusted R^2	0.419	0.470	0.378	0.428
N	5,603	5,534	6,509	6,447

Notes: In Panel A, stock (and option) compensation refers to the ratio of stock (and option) grants divided by market capitalization multiplied by 10,000. In Panel B, dependent variable is a dummy variable that equals one if the stock (and option) grant to the CEO has the vesting period more than 5 years, and zero otherwise. Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Size is natural logarithm of one plus total assets. Sales growth is the ratio of current year sales minus previous year sales and previous year sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table 8: Heterogeneity

Panel A: Peer performance sensitivity			Panel B: Equity compensation		
ΔDistance x Post x Ln(Local peer return)			Exposure x Post		
1. Board busyness					
Busy board	Less-busy board	Diff.	Busy board	Less-busy board	Diff.
0.005	0.035***	-0.030*	0.019	0.575***	-0.565**
(0.35)	(3.71)	(-1.950)	(0.099)	(3.244)	(-2.433)
2. Concentration of sales across the states					
Dispersed	Concentrated	Diff.	Dispersed	Concentrated	Diff.
0.029	0.045*	-0.016	0.331	0.723**	-0.391
(1.360)	(1.909)	(-0.564)	(1.235)	(2.606)	(-1.337)
3. Concentration of states mentioned in 10K					
Dispersed	Concentrated	Diff.	Dispersed	Concentrated	Diff.
0.003	0.057***	-0.054**	-0.232	0.401	-0.633
(0.153)	(3.288)	(-2.064)	(-0.894)	(1.477)	(-1.391)
4. Revenue of largest 8 firms in NAICS					
Low	High	Diff.	Low	High	Diff.
-0.003	0.035**	-0.037	0.391*	0.425**	-0.041
(-0.139)	(2.388)	(-1.463)	(1.756)	(2.075)	(-0.17)
5. CEO age					
< 60 years	≥ 60 years	Diff.	< 60 years	≥ 60 years	Diff.
0.008	0.059***	-0.056***	0.281	0.544***	-0.279
(0.807)	(4.044)	(-3.277)	(1.563)	(3.057)	(-1.453)
6. Inevitable Disclosure Doctrine					
IDD	Non-IDD	Diff.	IDD	Non-IDD	Diff.
-0.018	0.033***	-0.051***	-0.209	0.510***	-0.719**
(-0.984)	(8.078)	(-2.742)	(-0.680)	(4.923)	(-2.245)

Notes: This table presents six different heterogeneity tests. First, we split the sample based on the total number of directorships held by firm's directors in other firms in 2012, and denote the firm as having a "Busy board" ("Less-busy board") if this number is higher (lower) than the median value of each firm-size tertile. Second, we split the sample based on the sales among the states where the subsidiaries are located. Firms are assigned as "Concentrated" ("Dispersed") if the geographic concentration of firms' sales falls in top (bottom) 30 percentile across all firms. Third, we divide the sample based on the concentration of the states mentioned in annual reports in 2007 or 2008. Firms falling in top (bottom) 30 percentile of concentration are assigned as "Concentrated" ("Dispersed"). Fourth, we split the sample based on the percentage of the largest 8 firms over total revenue of each NAICS 4-digit in 2012. "High (Low)" group of firms are in NAICS whose percentage of revenue by 8 largest firms is top (bottom) quartile. Fifth, we divide the sample into firms with CEOs who are younger than 60 years old in 2012 and firms with CEOs who are 60 years old or older in 2012. Sixth, we divide sample into the firms located in states with or without Inevitable Disclosure Doctrine (IDD) recognized by courts in 2012. The dependent variables are the natural logarithm of one plus total compensation (Panel A) and the ratio of stock grants divided by market capitalization multiplied by 10,000 (Panel B). Panel A shows the coefficients on ΔDistance x Post x Ln(Local Peer Return) and Panel B shows the coefficients on Exposure x Post. In each panel, we also report the test statistics for the difference between the coefficients in two subsamples in column "Diff.". All other variables and defined in the same way as the previous tables. Firm fixed effects and joint fixed effect of SIC 2-digit and year are controlled for. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table 9: Incentive alignment and firm outcomes

Panel A: Industry-level exposure

	Gross margin		Return comovement	
Post x High exposure x High ΔStock grants	0.032**		0.044*	
	(2.622)		(1.983)	
Post x High exposure x High ΔStock and option grants		0.031***		0.051*
		(3.106)		(1.788)
Post x High exposure	-0.007	-0.005	-0.023**	-0.018**
	(-0.649)	(-0.554)	(-2.526)	(-2.258)
Post x High ΔStock grants	-0.020***		-0.028**	
	(-2.689)		(-2.061)	
Post x High ΔStock and option grants		-0.018***		-0.015
		(-2.818)		(-021)
Size_{t-1}	-0.011*	-0.010*	0.017***	0.016***
	(-1.898)	(-1.911)	(3.273)	(3.263)
$\text{Sales growth}_{t-1}$	0.014***	0.014***	0.014*	0.014*
	(2.842)	(2.838)	(1.992)	(1.947)
Constant	0.513***	0.510***	0.312***	0.313***
	(11.348)	(11.660)	(7.469)	(7.626)
Firm FE	YES	YES	YES	YES
SIC2 x Year FE	YES	YES	YES	YES
Adjusted R^2	0.925	0.925	0.682	0.687
N	13,644	13,644	7,154	7,154

Panel B: Firm-level exposure

	Gross profit margin		Return comovement	
Post x Exposure x ΔStock grants	0.684***		0.986**	
	(2.827)		(2.505)	
Post x Exposure x ΔStock and option grants		0.037*		0.977**
		(3.204)		(2.687)
Post x Exposure	-0.002**	-0.002*	-0.003*	-0.002
	(-2.071)	(-1.987)	(-1.784)	(-1.668)
Post x ΔStock grants	-8.175***		-2.514	
	(-5.017)		(-0.733)	
Post x ΔStock and option grants		-6.866***		-2.896
		(-4.619)		(-1.027)
Size_{t-1}	-0.013*	-0.012*	0.015***	0.016***
	(-1.979)	(-1.945)	(2.971)	(3.022)
$\text{Sales growth}_{t-1}$	0.016**	0.017**	0.014*	0.014*
	(2.518)	(2.588)	(2.004)	(2.014)
Constant	0.530***	0.526***	0.317***	0.315***
	(10.204)	(10.323)	(7.418)	(7.443)
Firm FE	YES	YES	YES	YES
SIC2 x Year FE	YES	YES	YES	YES
Adjusted R^2	0.929	0.929	0.688	0.688
N	12,603	12,603	7,139	7,139

Notes: Gross profit margin refers to the gross profit divided by sales. Return comovement refers to the average annual correlation of weekly stock market returns between firm and its local peers. Post is a dummy variable which is equal one if the year is on or after 2013 or zero otherwise. High exposure is a dummy indicator of the SIC 3-digit industry with the average "Exposure" being in the top tertile in 2013. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. High change in stock (and option) grants is a dummy indicator of the SIC 3-digit industry with the average change in stock (and option) grants to CEOs after 2013 being in the top tertile. Stock (and option) grants are measured as the ratio of stock (and option) compensation divided by market capitalization. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Size is natural logarithm of one plus total assets. Sales growth is the ratio of current year sales minus previous year sales and previous year sales. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table 10: Convicted cartel peers and compensation schemes

Panel A: Sensitivity of CEO pay to cartel peer performance

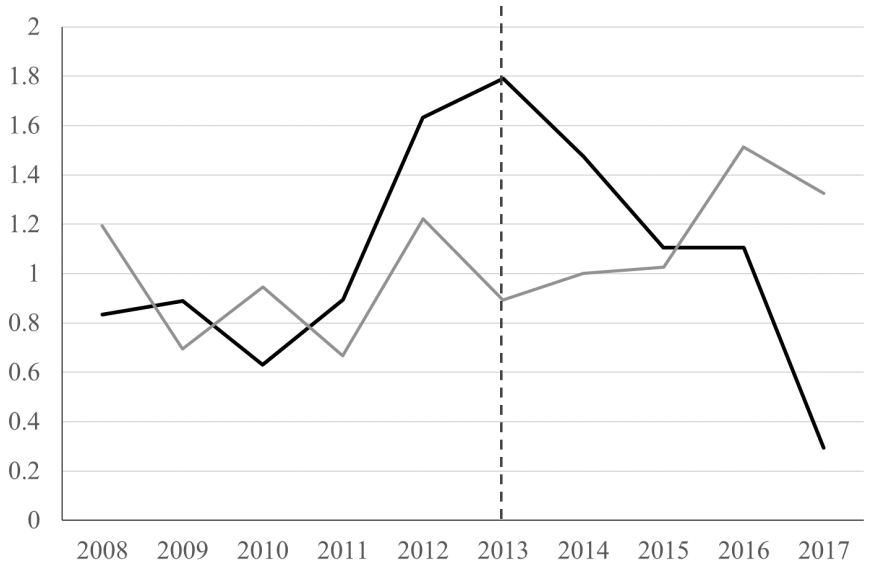
	Ln(Total compensation)			
Post x Ln(Own return)	-0.856***	-0.851***	-0.209	-0.032
	(-9.782)	(-9.651)	(-0.814)	(-0.146)
Post x Ln(Cartel peer return)	1.524***	1.472***		
	(6.803)	(6.534)		
Post x Ln(Average cartel peer return)			1.003***	0.807***
			(2.854)	(2.724)
Post	0.366***	0.336***	-0.350***	-0.298***
	(5.858)	(5.250)	(-3.033)	(-2.737)
Ln(Own return)	1.124***	1.108***	0.324	0.029
	(14.268)	(13.948)	(1.480)	(0.155)
Ln(Cartel peer return)	-1.757***	-1.731***		
	(-7.627)	(-7.458)		
Ln(Average cartel peer return)			-0.962***	-0.833***
			(-3.411)	(-3.457)
Size	-0.043**	-0.034	0.254***	-0.064
	(-2.043)	(-1.559)	(16.090)	(-1.197)
Constant	9.203***	9.124***	6.442***	9.676***
	(36.781)	(35.180)	(34.279)	(17.379)
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	NO	YES
Peer x Year FE	YES	YES	NO	NO
Pair FE	NO	YES	NO	NO
Adjusted R^2	0.504	0.500	0.238	0.479
Observations	10,250	10,250	1,222	1,222

Panel B: Overlap of cartel peers with compensation peers

	At least one peer	Fraction peers		N
	Overlap at the time of cartel			
General compensation benchmark	86	20.67%	7.81%	416
Relative performance evaluation benchmark	42	10.09%	3.67%	416
Difference		10.58%***	4.13%***	
		(5.803)	(4.838)	
	Overlap over the entire sample period			
General compensation benchmark	252	50.70%	20.25%	497
Relative performance evaluation benchmark	117	23.54%	8.09%	497
Difference		27.16%***	12.26%***	
		(12.095)	(10.317)	

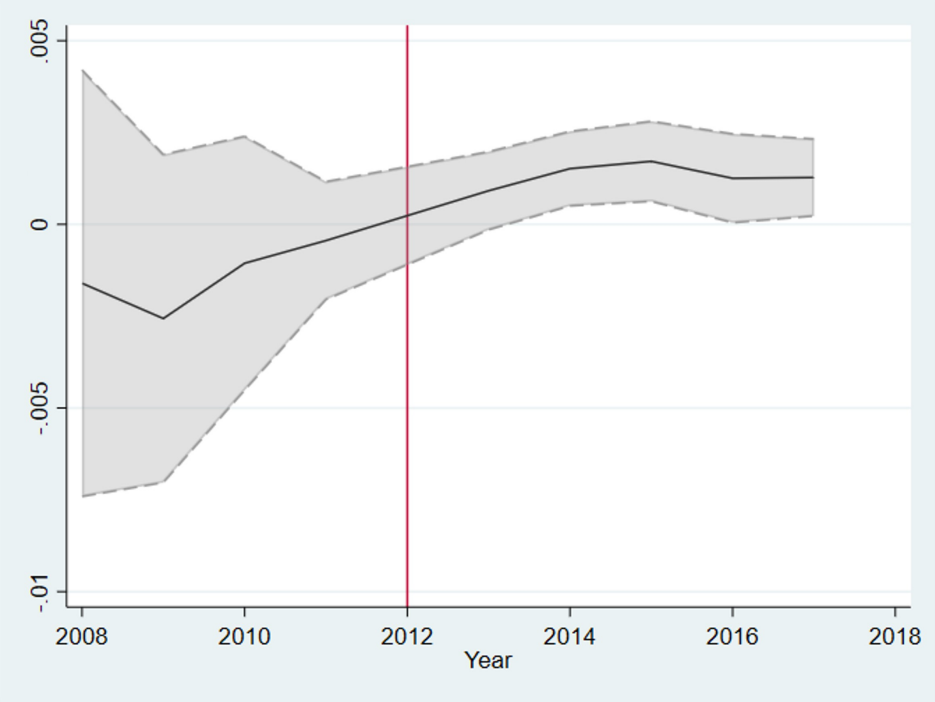
Notes: Panel A shows the sensitivity of CEO compensation to the performance of own firm and peer firms in the convicted cartels in Connor (2014). The left two columns show pairwise regression results, where the sample contains matched pairs of cartel members in each year. Post is a dummy indicator that equals one since the start year of each cartel. The right two columns show regression results in a panel constructed at a firm-year level, where we aggregate the stock returns of a firm's cartel peers in each year. Post dummy equals one since the starting year of the first collusion for a given firm. Our sample spans from 1996 to 2017. Ln(Total compensation) refers to natural logarithm of one plus the total compensation from Execucomp (tdc1). Ln(Own return) refers to natural logarithm of one plus the annual stock market return of own firm. Ln(Cartel peer return) refers to natural logarithm of one plus the annual stock market return of cartel peer. Ln(Average cartel peer return) refers to natural logarithm of one plus the average of annual stock market return of all cartel peers for a given firm. Size is natural logarithm of one plus total assets. All variables are winsorized in 0.5%. t-statistics are reported in the parentheses. Panel B shows the overlapping number of cartel peers and peer firms in compensation benchmark groups (for general compensation practice and for relative performance evaluation).

Figure 1: Number of antitrust case filings



Notes: This figure shows the number of antitrust case filings separately for the state courts where the field offices were closed over the period from 2008 to 2017 (dark grey line) and the state courts where the field offices were not closed over the same time period (light grey line). In 2013, DoJ closed down four of its seven regional offices (Atlanta, Cleveland, Dallas, and Philadelphia) that dealt with the antitrust enforcement. The change in coverage affected 23 states and territories: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Michigan (Eastern judicial district), Mississippi, New Jersey (Southern part), New Mexico, North Carolina, Ohio, Oklahoma, Pennsylvania, Puerto Rico, South Carolina, Tennessee, Texas, Virginia, West Virginia, and U.S. Virgin Islands.

Figure 2: Gross profit margins



Notes: We regress gross profit margin on year dummies interacted with dummy indicator equal to one if SIC 3-digit is in the top tertile of the exposure in 2013 and zero if it is in the bottom tertile. This figure plots the coefficients of the interaction terms. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. The regression also includes the lagged value of firm size and sales growth as control variables and the joint fixed effects of year and SIC 2-digit, and firm fixed effects. The shaded area shows the 90-percentile confidence interval. The full set of estimates are reported in Table IA11.

Internet Appendix

Table IA1: Performance metrics in cash incentive plans

	Profit margin		Sales		Strategic goals	
Exposure x Post	0.0028	0.0052**	-0.0049**	-0.0033	0.0058**	0.0046*
	(1.53)	(2.11)	(-2.07)	(-0.96)	(2.49)	(1.65)
$Size_{t-1}$	-0.0071	-0.011	-0.020	-0.017	-0.011	-0.0085
	(-0.84)	(-1.21)	(-1.12)	(-0.90)	(-1.36)	(-0.90)
Sales $growth_{t-1}$	0.0020	0.00050	0.0012	-0.0056	-0.010	-0.013
	(0.24)	(0.05)	(0.06)	(-0.26)	(-1.01)	(-1.09)
Ln(Tenure)	-0.0047	-0.0048	0.0017	0.00023	0.0060	0.0069
	(-1.32)	(-1.35)	(0.27)	(0.03)	(1.45)	(1.53)
Constant	0.12	0.15*	0.47***	0.45***	0.13*	0.11
	(1.58)	(1.85)	(3.02)	(2.73)	(1.84)	(1.32)
Year FE	YES	NO	YES	NO	YES	NO
Firm FE	YES	YES	YES	YES	YES	YES
SIC2 x Year FE	NO	YES	NO	YES	NO	YES
Adjusted R^2	0.515	0.510	0.667	0.669	0.344	0.338
N	8,615	8,547	8,615	8,547	8,615	8,547

Notes: This table shows how the choice of performance metrics in CEO cash incentive plans changed in response to the DoJ relocation event. The dependent variables are the dummy indicators for using a certain performance metric in the cash plans: (a) "profit margin", (b) "sales", and (c) "strategic goals". Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Size is natural logarithm of one plus total assets. Sales growth is the ratio of current year sales minus previous year sales and previous year sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA2: Explicit relative performance evaluation

	Explicit RPE	
Exposure x Post	0.0041	0.0035
	(1.26)	(0.93)
Size_{t-1}	0.0066	0.0014
	(0.21)	(0.04)
Sales growth_{t-1}	-0.0007	-0.015
	(-0.02)	(-0.51)
Ln(Tenure)	0.0023	-0.0005
	(0.26)	(-0.06)
Constant	0.33	0.39
	(1.17)	(1.18)
Year	YES	NO
Firm	YES	YES
SIC2 X Year	NO	YES
Adjusted R^2	0.652	0.656
N	7,261	7,255

Notes: This table shows the regressions of a dummy indicator of having explicit relative performance evaluation provision reported in CEO compensation package. Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Size is natural logarithm of one plus total assets. Sales growth is the ratio of current year sales minus previous year sales and previous year sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA3: Peer performance sensitivity and explicit performance benchmarking

	Ln(Total compensation)		Ln(Cash compensation)		Ln(Equity compensation)	
	Explicit performance benchmarking in 2013					
	Without	With	Without	With	Without	With
ΔDistance x Post x Ln(Return)	-0.042**	-0.004	-0.050**	0.016	-0.107	-0.013
	(-2.675)	(-0.403)	(-2.034)	(0.981)	(-1.174)	(-0.328)
ΔDistance x Post x Ln(Local peer return)	0.055**	0.027**	0.054**	0.005	0.275***	0.054
	(2.298)	(2.396)	(2.073)	(0.311)	(3.682)	(1.098)
ΔDistance x Post	0.016	0.025***	0.041	0.020**	0.049**	0.023
	(1.677)	(3.329)	(1.470)	(2.675)	(2.023)	(0.835)
Ln(Return)	0.093*	0.025	0.151***	0.196**	0.163	-0.035
	(1.785)	(0.437)	(3.425)	(2.476)	(0.764)	(-0.172)
Ln(Local peer return)	0.013	0.067	0.120**	-0.024	-0.215	0.367
	(0.230)	(0.906)	(2.120)	(-0.428)	(-0.875)	(1.640)
Local market	-0.029	-0.099	0.084	-0.090	-0.153	-0.275
	(-0.498)	(-1.276)	(0.880)	(-1.224)	(-0.604)	(-1.437)
ΔDistance x Ln(Return)	-0.011*	0.000	0.010	-0.006	-0.018	-0.020
	(-1.717)	(0.032)	(1.288)	(-0.899)	(-0.338)	(-0.800)
Post x Ln(Return)	0.237**	0.075	0.468***	0.104	0.226	-0.127
	(2.611)	(0.839)	(3.826)	(0.943)	(0.736)	(-0.414)
ΔDistance x Ln(Local peer return)	0.018	-0.013	-0.001	-0.007	0.050	-0.037
	(1.436)	(-1.444)	(-0.105)	(-0.789)	(1.453)	(-1.431)
Post x Ln(Local peer return)	-0.184**	-0.183	-0.157	0.047	-0.409	-0.637
	(-2.082)	(-1.657)	(-1.131)	(0.453)	(-1.134)	(-1.670)
ΔDistance x Local market	0.007	0.031**	0.021	0.036***	-0.048	0.060
	(0.571)	(2.089)	(1.077)	(3.601)	(-0.907)	(1.416)
Post x Local market	0.041	0.100*	0.074	0.047	0.096	0.275
	(0.809)	(1.837)	(0.870)	(0.915)	(0.512)	(1.105)
ΔDistance x Post x Local market	0.004	-0.037***	-0.039	-0.038***	-0.001	-0.082**
	(0.432)	(-4.366)	(-1.441)	(-4.506)	(-0.031)	(-2.383)
Size_{t-1}	0.232***	0.101**	0.172**	0.012	0.255	-0.020
	(3.323)	(2.299)	(2.401)	(0.127)	(1.646)	(-0.141)
$\text{Sales growth}_{t-1}$	0.127*	0.058	0.173**	0.058	0.346	0.362**
	(1.928)	(1.269)	(2.227)	(0.829)	(1.275)	(2.277)
Ln(Tenure)	0.035	0.078***	0.069***	0.108***	-0.167	-0.044
	(1.241)	(5.801)	(2.928)	(3.821)	(-1.408)	(-0.797)
Constant	6.483***	7.781***	5.761***	7.514***	5.141***	8.294***
	(10.894)	(19.214)	(9.065)	(7.972)	(3.884)	(6.351)
Firm FE	YES	YES	YES	YES	YES	YES
SIC2 x Year FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.687	0.663	0.703	0.586	0.430	0.286
N	3,229	2,515	3,229	2,515	3,229	2,515

Notes: The sample is divided by whether the firm awards CEO based on the relative performance evaluation in 2013. The dependent variables are the logarithm of one plus total compensation, cash compensation, and equity compensation. Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 100 miles. Ln(Return) (Ln(Local peer return)) refers to logarithm of one plus annual stock market return of focal firm (local peer firms). Local market is an indicator for the presence of local peer firms. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Controls include lagged value of size, lagged value sales growth and logarithm of CEO tenure. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA4: Pairwise specification: Decomposition

	Ln(Cash compensation)			Ln(Equity compensation)		
ΔDistance x Post x Ln(Peer return) x Local dummy	0.016**	0.016**	0.017**	0.023	0.023	0.015
	(2.397)	(2.308)	(2.301)	(0.454)	(0.457)	(0.256)
ΔDistance x Post	-0.004	-0.004	-0.003	-0.049*	-0.050*	-0.059**
	(-0.951)	(-1.028)	(-0.742)	(-1.776)	(-1.803)	(-2.042)
Ln(Return)	0.177***	0.176***	0.159***	0.056	0.057	0.048
	(5.630)	(5.478)	(4.714)	(0.561)	(0.565)	(0.479)
Ln(Peer return)	-0.006	-0.006	-0.006	0.001	-0.012	-0.006
	(-1.481)	(-1.496)	(-1.364)	(0.063)	(-0.713)	(-0.350)
Local dummy	-0.104	-0.104	-0.098	0.167	0.162	0.182
	(-0.951)	(-0.951)	(-0.951)	(1.237)	(1.200)	(1.198)
ΔDistance x Ln(Peer return)	-0.003	-0.003	-0.002	0.002	0.002	0.002
	(-1.633)	(-1.641)	(-0.866)	(0.183)	(0.235)	(0.184)
Post x Ln(Peer return)	0.026**	0.021*	0.018	-0.000	0.010	-0.001
	(2.057)	(1.911)	(1.450)	(-0.003)	(0.194)	(-0.009)
ΔDistance x Local dummy	0.015	0.016	0.015	-0.026*	-0.026*	-0.028
	(1.248)	(1.267)	(1.281)	(-1.742)	(-1.735)	(-1.642)
Post x Local dummy	0.149	0.145	0.142	-0.379**	-0.388**	-0.521***
	(0.951)	(0.929)	(0.942)	(-2.526)	(-2.616)	(-3.505)
Ln(Peer return) x Local dummy	0.105***	0.101***	0.114***	0.108	0.123	0.111
	(3.039)	(3.029)	(2.855)	(0.685)	(0.789)	(0.655)
ΔDistance x Post x Ln(Peer return)	-0.001	-0.002	-0.002	-0.024*	-0.023	-0.030*
	(-0.333)	(-0.550)	(-0.380)	(-1.679)	(-1.572)	(-1.712)
ΔDistance x Post x Local dummy	-0.017	-0.017	-0.017	0.049	0.050	0.067*
	(-1.017)	(-1.009)	(-1.049)	(1.280)	(1.300)	(1.709)
ΔDistance x Ln(Peer return) x Local dummy	-0.007	-0.007*	-0.010**	-0.022	-0.023	-0.022
	(-1.662)	(-1.678)	(-2.072)	(-1.063)	(-1.172)	(-1.008)
Post x Ln(Peer return) x Local dummy	-0.145**	-0.140**	-0.150**	0.204	0.189	0.344
	(-2.182)	(-2.143)	(-2.163)	(0.531)	(0.491)	(0.767)
Size_{t-1}	0.173***	0.174***	0.177***	0.567***	0.567***	0.571***
	(2.927)	(2.909)	(2.912)	(3.438)	(3.387)	(2.922)
$\text{Sales growth}_{t-1}$	0.070*	0.070*	0.061*	0.186	0.190	0.163
	(1.939)	(1.954)	(1.731)	(1.373)	(1.405)	(1.226)
Ln(Tenure)	0.081***	0.081***	0.077***	-0.201***	-0.202***	-0.217***
	(4.421)	(4.413)	(4.099)	(-3.639)	(-3.687)	(-3.922)
Constant	5.634***	5.630***	5.601***	1.866	1.874	1.864
	(10.766)	(10.673)	(10.399)	(1.306)	(1.293)	(1.106)
Firm FE	YES	YES	YES	YES	YES	YES
SIC2 x Year FE	YES	YES	YES	YES	YES	YES
Peer FE	YES	YES	YES	YES	YES	YES
Peer SIC2 x Year FE	NO	YES	YES	NO	YES	YES
Pair FE	NO	NO	YES	NO	NO	YES
Adjusted R^2	0.777	0.778	0.764	0.618	0.619	0.571
N	328,078	328,046	307,953	327,824	327,792	307,697

Notes: The dependent variables are natural logarithm of cash (equity) compensation in the first (last) three columns. Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 100 miles. Ln(Return) (Ln(Peer return)) refers to natural logarithm of one plus annual stock market return of focal firm (Peer firms). Local dummy is an indicator for the presence of local peer firms under the definition above. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Size is natural logarithm of one plus total assets. Sales growth is the ratio of current year sales minus previous year sales and previous year sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. (Peer) SIC 2-digit x Year FE is joint fixed effect between year and industry with the SIC 2-digit code of (peer) firm. Pair FE is fixed effect for the pair of focal firm and a particular peer firm. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA5: Robustness tests for peer performance sensitivity

	Ln(Total compensation)					
	Same state & SIC 3-digit		Less than 100 miles & SIC 3-digit		Less than 400 miles & SIC 3-digit	
ΔDistance x Post x Ln(Return)	-0.019***	-0.016***	-0.019***	-0.017***	-0.021***	-0.017***
	(-5.924)	(-3.421)	(-5.957)	(-3.388)	(-5.181)	(-3.301)
ΔDistance x Post x Ln(Local peer return)	0.021***	0.015*	0.023***	0.023***	0.024***	0.021***
	(6.069)	(1.678)	(4.295)	(2.811)	(2.899)	(3.075)
ΔDistance x Post	0.002	0.006	0.001	0.004	0.003	0.007
	(0.681)	(1.317)	-0.407	-0.838	(0.820)	(1.070)
Ln(Return)	0.095***	0.106***	0.100***	0.106***	0.097***	0.104***
	(4.782)	(4.945)	-5.108	-5.018	(4.773)	(4.912)
Ln(Local peer return)	0.035	0.048	0.009	0.014	0.025	0.024
	(1.286)	(1.272)	-0.546	-0.603	(1.033)	(0.982)
Local market	0.011	-0.008	-0.003	-0.073	-0.057	-0.079
	(0.088)	(-0.055)	(-0.055)	(-0.833)	(-0.837)	(-1.125)
ΔDistance x Ln(Return)	0.000	-0.004	0.000	-0.004	0.001	-0.003
	(0.160)	(-0.978)	(-0.034)	(-1.022)	(0.266)	(-0.889)
Post x Ln(Return)	0.179***	0.139***	0.173***	0.142***	0.178***	0.144***
	(7.109)	(4.644)	-7.04	-4.879	(7.101)	(4.978)
ΔDistance x Ln(Local peer return)	-0.004	0.002	-0.003	0.004	-0.005**	-0.001
	(-1.291)	(0.353)	(-1.592)	-0.937	(-2.010)	(-0.269)
Post x Ln(Local peer return)	-0.148***	-0.181***	-0.088***	-0.101**	-0.088***	-0.080*
	(-6.121)	(-3.924)	(-3.048)	(-2.523)	(-3.071)	(-1.987)
ΔDistance x Local market	-0.004	-0.003	0.019**	0.030**	0.003	0.011
	(-0.255)	(-0.147)	-2.616	-2.181	(0.308)	(0.857)
Post x Local market	0.099***	0.086**	0.061**	0.046	0.055	0.045
	(4.396)	(2.434)	-2.266	-1.006	(1.603)	(0.846)
ΔDistance x Ln(Return) x Local market	-0.006	-0.011*	-0.005	-0.01	-0.006	-0.012
	(-1.199)	(-1.914)	(-0.773)	(-1.412)	(-1.081)	(-1.409)
$Size_{t-1}$	0.256***	0.287***	0.256***	0.284***	0.255***	0.284***
	(12.266)	(12.243)	-12.136	-12.172	(12.488)	(12.246)
Sales $growth_{t-1}$	0.105***	0.073**	0.106***	0.075**	0.104***	0.073**
	(3.798)	(2.282)	-3.877	-2.375	(3.875)	(2.360)
Ln(Tenure)	0.045***	0.031***	0.045***	0.030***	0.045***	0.030***
	(4.269)	(2.803)	-4.327	-2.761	(4.266)	(2.765)
Constant	6.061***	5.859***	6.063***	5.893***	6.113***	5.921***
	(33.030)	(30.748)	-35.767	-35.025	(38.197)	(34.114)
Year FE	YES	NO	YES	NO	YES	NO
Firm FE	YES	YES	YES	YES	YES	YES
SIC2 x Year FE	NO	YES	NO	YES	NO	YES
Adjusted R^2	0.765	0.770	0.765	0.77	0.765	0.770
N	12,185	11,661	12,185	11,661	12,185	11,661

Notes: The dependent variables are natural logarithm of one plus total compensation. Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 100 miles. Ln(Return) (Ln(Local peer return)) refers to natural logarithm of one plus annual stock market return of focal firm (local peer firms). Local market is an indicator for the presence of local peer firms. We define local peer firms in three different ways: 1) the ones in the same state and SIC 3-digit code, 2) the ones located within 100 miles and have the same SIC 3-digit code, and 3) the ones located within 400 miles and have the same SIC 3-digit code with the focal firm. Size is natural logarithm of one plus total assets. Sales growth is the annual percentage change in sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA6: Convergence of time horizon of equity compensation

	% of peers within 6 month difference of vesting deadlines			
	Stock grants		Option and stock grants	
Exposure x Post	0.152***	0.089*	0.156***	0.079**
	(3.254)	(1.749)	(5.321)	(2.292)
Size_{t-1}	-0.460***	0.046	-0.601**	-0.256
	(-2.892)	(0.237)	(-2.359)	(-0.787)
$\text{Sales growth}_{t-1}$	0.355	0.052	0.054	0.049
	(1.401)	(0.194)	(0.339)	(0.144)
Ln(Tenure)	0.033	0.074	-0.012	0.049
	(0.340)	(0.590)	(-0.114)	(0.477)
Constant	7.430***	2.729	9.363***	6.101**
	(5.119)	(1.516)	(4.134)	(2.053)
Year FE	YES	NO	YES	NO
Firm FE	YES	YES	YES	YES
SIC2 x Year FE	NO	YES	NO	YES
Adjusted R^2	0.573	0.655	0.600	0.661
N	3,336	3,204	3,336	3,204

Notes: The dependent variables are the number of local peer firms within 6-month difference of vesting deadlines from the focal firms divided by the number of local peer firms. Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Size is natural logarithm of one plus total assets. Sales growth is the ratio of current year sales minus previous year sales and previous year sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels except the dummy variable. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA7: Heterogeneity: Board busyness

Panel A: Peer performance sensitivity

	Ln(Total compensation)	
	Less-busy board	Busy board
ΔDistance x Post x Ln(Return)	-0.032***	-0.015
	(-4.994)	(-1.604)
ΔDistance x Post x Ln(Local peer return)	0.035***	0.005
	(3.706)	(0.353)
ΔDistance x Post	0.017***	-0.006
	(3.478)	(-1.412)
Ln(Return)	0.037	0.156***
	(1.355)	(5.367)
Ln(Local peer return)	0.060	-0.094**
	(1.024)	(-2.091)
Local market	-0.017	-0.026
	(-0.386)	(-0.755)
ΔDistance x Ln(Return)	0.003	-0.001
	(0.981)	(-0.214)
Post x Ln(Return)	0.274***	0.090**
	(5.676)	(2.358)
ΔDistance x Ln(Local peer return)	-0.013**	0.005
	(-2.071)	(0.569)
Post x Ln(Local peer return)	-0.096	0.017
	(-1.328)	(0.260)
ΔDistance x Local market	0.017**	0.004
	(2.228)	(0.581)
Post x Local market	0.039	-0.009
	(0.979)	(-0.181)
ΔDistance x Post x Local market	-0.027***	0.011
	(-3.912)	(1.330)
Size_{t-1}	0.323***	0.185***
	(11.178)	(6.306)
$\text{Sales growth}_{t-1}$	0.131***	0.016
	(3.886)	(0.408)
Ln(Tenure)	0.020	0.049***
	(1.355)	(2.980)
Constant	5.435***	6.844***
	(23.031)	(29.066)
SIC2 x Year FE	YES	YES
Firm FE	YES	YES
Adjusted R^2	0.750	0.781
N	5,299	5,066

Panel B: Equity compensation

	Stock grants	
	Less-busy board	Busy board
Exposure x Post	0.575***	0.019
	(3.244)	(0.099)
$Size_{t-1}$	0.853	-0.596
	(0.634)	(-0.421)
Sales $growth_{t-1}$	-2.678**	-0.885
	(-2.150)	(-0.780)
Ln(Tenure)	-1.234*	-0.963***
	(-1.693)	(-2.978)
Constant	5.433	16.069
	(0.537)	(1.391)
Firm FE	YES	YES
SIC2 x Year FE	YES	YES
Adjusted R^2	0.252	0.363
N	6,493	6,067

Notes: In both Panels A and B, we provide estimations where we split our original sample based on the total number of directorships held by firm's directors in other firms (busy directors) in 2012. We denote the firm as having a "Busy board" ("Less-busy board") if total directorships is higher (lower) than the median value of each firm-size tertile. Dependent variables are the logarithm of one plus total compensation (Panel A) and the ratio of stock grants divided by market capitalization multiplied by 10,000 (Panel B). Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 100 miles. Ln(Return) (Ln(Local peer return)) refers to natural logarithm of one plus annual stock market return of focal firm (local peer firms). Local market is an indicator for the presence of local peer firms. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. Controls include lagged value of size, lagged value sales growth and logarithm of CEO tenure. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA8: Heterogeneity: Distribution of firm operations

Panel A: Peer performance sensitivity

	Ln(Total compensation)			
	Concentration of			
	sales across the states		states mentioned in 10K	
	Dispersed	Concentrated	Dispersed	Concentrated
ΔDistance x Post x Ln(Return)	-0.017*	-0.059***	-0.027***	-0.010
	(-1.886)	(-4.879)	(-3.221)	(-1.032)
ΔDistance x Post x Ln(Local peer return)	0.029	0.045*	0.003	0.057***
	(1.36)	(1.909)	(0.153)	(3.288)
ΔDistance x Post	0.018***	0.003	0.018***	-0.023**
	(4.906)	(0.442)	(3.360)	(-2.644)
Ln(Return)	0.045	0.080*	0.130***	0.104***
	(1.137)	(1.685)	(2.775)	(2.784)
Ln(Local peer return)	-0.08	-0.009	0.038	-0.070
	(-1.055)	(-0.077)	(0.611)	(-0.943)
Local market	0.002	-0.041	-0.059	0.065
	(0.04)	(-0.752)	(-1.394)	(1.111)
ΔDistance x Ln(Return)	-0.01	0.014*	0.009	0.001
	(-1.685)	(1.689)	(1.003)	(0.187)
Post x Ln(Return)	0.232***	0.306***	0.148**	0.083
	(4.183)	(4.441)	(2.461)	(1.550)
ΔDistance x Ln(Local peer return)	0.001	-0.024	-0.021*	0.006
	(0.089)	(-1.377)	(-1.794)	(0.630)
Post x Ln(Local peer return)	-0.076	0.022	-0.096	0.008
	(-0.774)	(0.195)	(-0.750)	(0.101)
ΔDistance x Local market	-0.007	0.002	0.027***	-0.013
	(-0.871)	(0.196)	(3.809)	(-1.145)
Post x Local market	0.01	0.019	0.036	-0.004
	(0.161)	(0.229)	(0.579)	(-0.065)
ΔDistance x Post x Local market	-0.006	0	-0.024**	0.007
	(-0.61)	(0.017)	(-2.138)	(0.681)
Size_{t-1}	0.123**	0.359***	0.044	0.317***
	(2.627)	(9.667)	(0.785)	(7.298)
$\text{Sales growth}_{t-1}$	0.221***	0.097**	0.165***	0.101
	(3.619)	(2.211)	(3.577)	(1.650)
Ln(Tenure)	0.036	0.035	0.093***	-0.015
	(1.465)	(1.412)	(4.882)	(-0.624)
Constant	7.456***	5.147***	7.847***	5.582***
	(18.446)	(18.153)	(17.408)	(15.591)
Firm FE	YES	YES	YES	YES
SIC2 x Year FE	YES	YES	YES	YES
Adjusted R^2	0.765	0.714	0.746	0.811
N	2,856	2,619	2,806	2,840

Panel B: Equity compensation

	Stock grants			
	Concentration of			
	sales across the states		states mentioned in 10K	
	Dispersed	Concentrated	Dispersed	Concentrated
Exposure x Post	0.331	0.723**	-0.232	0.401
	(1.235)	(2.606)	(-0.894)	(1.477)
$Size_{t-1}$	-1.730	-0.019	-0.148	-3.098**
	(-0.752)	(-0.010)	(-0.081)	(-2.066)
Sales $growth_{t-1}$	0.591	-1.052	-4.071**	1.123
	(0.435)	(-0.523)	(-2.652)	(0.703)
Ln(Tenure)	-0.397	-0.642	-0.166	-1.417
	(-1.023)	(-1.297)	(-0.316)	(-1.451)
Constant	23.548	12.557	11.307	35.722***
	(1.182)	(0.927)	(0.741)	(2.822)
Firm FE	YES	YES	YES	YES
SIC2 x Year FE	YES	YES	YES	YES
Adjusted R^2	0.409	0.311	0.332	0.295
N	3,476	3,170	3,281	3,207

Notes: In both Panels A and B, we provide estimations where we split our original sample based on the sales distribution among the states where the subsidiaries and headquarters are located. In the first two columns, firms are assigned as "Concentrated" ("Dispersed") if the geographic concentration of firms' sales falls in top (bottom) 30 percentile across all firms in 2012. In the next two columns, we divide the sample based on the concentration of the states mentioned in annual reports in 2007 or 2008. Firms falling in top (bottom) 30 percentile of concentration are assigned as "Concentrated" ("Dispersed"). Dependent variables are the logarithm of one plus total compensation (Panel A) and the ratio of stock grants divided by market capitalization multiplied by 10,000 (Panel B). Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 100 miles. Ln(Return) (Ln(Local peer return)) refers to natural logarithm of one plus annual stock market return of focal firm (local peer firms). Local market is an indicator for the presence of local peer firms. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. Controls include lagged value of size, lagged value sales growth and logarithm of CEO tenure. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA9: Heterogeneity: Industry concentration

Panel A: Peer performance sensitivity

	Ln(Total compensation)	
	Revenue of 8 largest firms in NAICS	
	Low	High
ΔDistance x Post x Ln(Return)	-0.003	-0.025***
	(-0.348)	(-2.786)
ΔDistance x Post x Ln(Local peer Return)	-0.003	0.035**
	(-0.139)	(2.388)
ΔDistance x Post	0.015*	0.008
	(2.021)	(0.680)
Ln(Return)	0.162***	0.039
	(2.931)	(0.920)
Ln(Local peer Return)	-0.047	0.014
	(-0.716)	(0.182)
Local market	0.130*	-0.008
	(1.834)	(-0.180)
ΔDistance x Ln(Return)	-0.006	-0.006
	(-1.128)	(-1.462)
Post x Ln(Return)	0.124**	0.270***
	(2.051)	(3.376)
ΔDistance x Ln(Local peer Return)	0.030*	0.012
	(1.957)	(1.249)
Post x Ln(Local peer Return)	-0.084	0.010
	(-0.893)	(0.076)
ΔDistance x Local market	0.016	-0.009
	(1.009)	(-1.106)
Post x Local market	0.015	-0.010
	(0.209)	(-0.123)
ΔDistance x Post x Local market	-0.017	-0.001
	(-1.078)	(-0.071)
Size_{t-1}	0.236***	0.210***
	(4.577)	(5.589)
$\text{Sales growth}_{t-1}$	0.179**	0.036
	(2.286)	(0.457)
Ln(Tenure)	0.028	-0.013
	(1.128)	(-0.527)
Constant	6.291***	6.686***
	(16.666)	(21.479)
Firm FE	YES	YES
SIC2 x Year FE	YES	YES
Adjusted R^2	0.762	0.761
N	1,880	2,511

Panel B: Equity compensation

	Stock grants	
	Revenue of 8 largest firms in NAICS	
	Low	High
Exposure x Post	0.391*	0.425**
	(1.756)	(2.075)
Size_{t-1}	0.903	-1.169
	(0.815)	(-0.837)
$\text{Sales growth}_{t-1}$	0.670	-6.844***
	(0.489)	(-2.962)
Ln(Tenure)	-1.832***	-1.225
	(-3.113)	(-1.535)
Constant	6.457	21.624*
	(0.749)	(1.904)
Firm FE	YES	YES
SIC2 x Year FE	YES	YES
Adjusted R^2	0.322	0.273
N	2,833	2,852

Notes: In both Panels A and B, we provide estimations where we split our original sample based on the revenue of the 8 largest firms as percentage of total revenue of NAICS in 2012. We denote the firm in "High" ("Low") group if the revenue of the 8 largest firms is in top (bottom) quartile. Dependent variables are the logarithm of one plus total compensation (Panel A) and the ratio of stock grants divided by market capitalization multiplied by 10,000 (Panel B). Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 100 miles. Ln(Return) (Ln(Local peer return)) refers to natural logarithm of one plus annual stock market return of focal firm (local peer firms). Local market is an indicator for the presence of local peer firms. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. Controls include lagged value of size, lagged value sales growth and logarithm of CEO tenure. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA10: Heterogeneity: CEO characteristics

Panel A: Peer performance sensitivity

	Ln(Total compensation)			
	CEO age		Inevitable Disclosure Doctrine	
	< 60 years	> 60 years	With	Without
ΔDistance x Post x Ln(Return)	-0.009*	-0.047**	0.010	-0.024***
	(-1.717)	(-2.691)	(0.798)	(-5.682)
ΔDistance x Post x Ln(Local peer return)	0.008	0.059***	-0.018	0.033***
	(0.807)	(4.044)	(-0.984)	(8.078)
ΔDistance x Post	0.001	0.009*	0.003	0.003
	(0.400)	(1.790)	(0.470)	(0.763)
Ln(Return)	0.086***	0.072	0.103**	0.055**
	(2.854)	(1.580)	(2.716)	(2.238)
Ln(Local peer return)	-0.059	0.144*	0.024	-0.033
	(-1.617)	(1.780)	(0.351)	(-0.675)
Local market	-0.018	-0.083	0.053	-0.060
	(-0.523)	(-1.602)	(0.917)	(-1.689)
ΔDistance x Ln(Return)	-0.003	0.010	-0.010	0.002
	(-0.790)	(1.326)	(-1.077)	(0.603)
Post x Ln(Return)	0.158***	0.177**	0.134**	0.209***
	(3.999)	(2.405)	(2.418)	(7.086)
ΔDistance x Ln(Local peer return)	0.008	-0.026***	0.004	-0.001
	(1.240)	(-2.932)	(0.366)	(-0.146)
Post x Ln(Local peer return)	-0.025	-0.136*	-0.046	-0.051
	(-0.374)	(-1.746)	(-0.472)	(-0.843)
ΔDistance x Local market	0.012**	0.012	-0.003	0.013**
	(2.548)	(1.197)	(-0.155)	(2.192)
Post x Local market	0.026	0.011	-0.009	0.013
	(0.759)	(0.155)	(-0.157)	(0.343)
ΔDistance x Post x Local market	-0.002	-0.016	-0.007	-0.005
	(-0.300)	(-1.537)	(-0.490)	(-1.360)
Size_{t-1}	0.247***	0.277***	0.287***	0.230***
	(6.852)	(4.119)	(5.169)	(11.406)
$\text{Sales growth}_{t-1}$	0.057*	0.181***	0.131***	0.066*
	(1.912)	(3.153)	(2.860)	(2.115)
Ln(Tenure)	0.041**	0.036	0.060***	0.026
	(2.661)	(1.433)	(3.589)	(1.622)
Constant	6.166***	5.943***	5.743***	6.381***
	(20.478)	(10.861)	(12.975)	(36.631)
Firm FE	YES	YES	YES	YES
SIC2 x Year FE	YES	YES	YES	YES
Adjusted R^2	0.777	0.759	0.769	0.775
N	7,668	3,221	4,297	6,606

Panel B: Equity compensation

	Stock grants			
	CEO age		Inevitable Disclosure Doctrine	
	< 60 years	> 60 years	With	Without
Exposure x Post	0.281	0.544***	-0.209	0.510***
	(1.563)	(3.057)	(-0.680)	(4.923)
$Size_{t-1}$	0.156	-2.041	0.780	-1.058
	(0.176)	(-0.885)	(0.484)	(-0.798)
Sales $growth_{t-1}$	-2.088*	-0.366	-3.565*	-1.166
	(-1.813)	(-0.229)	(-1.970)	(-0.959)
Ln(Tenure)	-0.859	-1.216*	-0.783	-1.133
	(-1.617)	(-1.940)	(-1.642)	(-1.652)
Constant	10.341	27.516	4.705	20.241*
	(1.386)	(1.536)	(0.363)	(1.997)
Firm FE	YES	YES	YES	YES
SIC2 x Year FE	YES	YES	YES	YES
Adjusted R^2	0.303	0.271	0.335	0.282
N	8,722	3,899	4,870	7,768

Notes: In the first two columns of both Panels A and B, we provide estimations where we split our original sample based on the firm's CEO's age in 2012. We refer to firms with CEOs who are 60 years old or younger in 2012 as "< 60 years" and firms with CEOs who are older than 60 years old in 2012 as "> 60 years". In the last two columns of both Panels A and B, we provide estimations where we split our original sample based on whether firm's headquarter state's court recognizes the Inevitable Disclosure Doctrine (IDD) or not. Dependent variables are the logarithm of one plus total compensation (Panel A) and the ratio of stock grants divided by market capitalization multiplied by 10,000 (Panel B). Post is a dummy variable which is one if the year is on or after 2013 or zero otherwise. ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 100 miles. Ln(Return) (Ln(Local peer return)) refers to natural logarithm of one plus annual stock market return of focal firm (local peer firms). Local market is an indicator for the presence of local peer firms. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. Controls include lagged value of size, lagged value sales growth, and logarithm of CEO tenure. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2008 to 2017. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA11: Trend of gross margins

	Gross margin
High exposure x 2008	-0.002
	(-0.463)
High exposure x 2009	-0.003
	(-0.963)
High exposure x 2010	-0.001
	(-0.514)
High exposure x 2011	-0.000
	(-0.461)
High exposure x 2013	0.001
	(1.440)
High exposure x 2014	0.002**
	(2.503)
High exposure x 2015	0.002**
	(2.634)
High exposure x 2016	0.001*
	(1.735)
High exposure x 2017	0.001**
	(2.034)
Size_{t-1}	-0.021**
	(-2.557)
$\text{Sales growth}_{t-1}$	0.013
	(1.666)
Constant	0.579***
	(8.599)
Firm FE	YES
SIC2 x Year FE	YES
Adjusted R^2	0.919
N	9,042

Notes: This table shows results of the gross profit margin dynamics. Gross profit margin refers to the gross profit divided by sales. High exposure is a dummy indicator which is one if the average "Exposure" of the 3-digit SIC industry is in the top tertile in 2013 or zero if it is in the bottom tertile. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. Size is natural logarithm of one plus total assets. Sales growth is the ratio of current year sales minus previous year sales and previous year sales. All the variables are winsorized at 0.5% on both sides. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA12: The profitability changes of exposed firms' local peers

Exposed firms with increased profitability		Exposed firms with decreased profitability	
Number of firms	Average number of local peers	Number of firms	Average number of local peers
198	11.1	94	4.4
Average number of local peers with		Average number of local peers with	
increased profitability	decreased profitability	increased profitability	decreased profitability
10.5	0.6	1.1	3.3

Notes: This table shows summary statistics of how the profitability of exposed firms' local peers changed during the period of 2013 to 2017 relative to 2007 to 2012. For each firm, we calculate the average gross profit margin before and after 2013 and measure the change across two periods. We leave out the firms and peers that had less than three years of observation either before or after 2013. Then we separate firms into two groups according to whether the firm's profitability increased or decreased since 2013. For each firm, we further count the number of two types of local peers, which are the ones with an increase or a decrease in profitability since 2013. In the table, we report the mean value of number of two types of local peers and the average number of local peers for each group of the exposed firms.

Table IA13: Explicit performance benchmarking and firm outcomes

	Explicit RPE in 2012					
	YES	NO	YES	NO	YES	NO
	Gross profit margin					
Post x High exposure	0.015	0.041*	0.000	0.026	-0.004	0.025
	(1.162)	(1.869)	(0.008)	(1.271)	(-0.250)	(1.372)
Post x High exposure x High change in stock			-0.007	0.045		
			(-0.282)	(1.237)		
Post x High exposure x High change in stock and option					0.015	0.061**
					(0.684)	(2.044)
Post x High change in stock			-0.044***	-0.018		
			(-2.892)	(-1.571)		
Post x High change in stock and option					-0.057***	-0.020
					(-3.688)	(-1.489)
$Size_{t-1}$	-0.048***	-0.003	-0.048***	-0.003	-0.045***	-0.003
	(-4.257)	(-0.471)	(-3.927)	(-0.477)	(-3.845)	(-0.491)
Sales $growth_{t-1}$	0.006	0.018	0.004	0.018	0.003	0.018
	(0.749)	(1.120)	(0.506)	(1.105)	(0.390)	(1.122)
Constant	0.857***	0.458***	0.861***	0.463***	0.843***	0.463***
	(8.035)	(8.363)	(7.476)	(8.417)	(7.486)	(8.382)
Firm FE	YES	YES	YES	YES	YES	YES
SIC2 x Year FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.925	0.914	0.925	0.914	0.926	0.914
N	2,903	4,178	2,903	4,178	2,903	4,178
	Return comovement					
Post x High exposure	-0.005	0.028*	0.000	-0.010	-0.003	-0.007
	(-0.236)	(1.876)	(0.008)	(-0.625)	(-0.138)	(-0.339)
Post x High exposure x High change in stock			-0.035	0.090**		
			(-0.607)	(2.518)		
Post x High exposure x High change in stock and option					-0.002	0.136*
					(-0.044)	(1.753)
Post x High change in stock			0.010	-0.048*		
			(0.430)	(-1.946)		
Post x High change in stock and option					0.006	-0.058
					(0.281)	(-1.125)
$Size_{t-1}$	-0.007	0.002	-0.007	0.003	-0.007	0.002
	(-0.457)	(0.271)	(-0.475)	(0.347)	(-0.480)	(0.308)
Sales $growth_{t-1}$	0.028***	-0.004	0.028**	-0.004	0.029***	-0.004
	(2.838)	(-0.402)	(2.720)	(-0.406)	(2.867)	(-0.361)
Constant	0.588***	0.401***	0.591***	0.408***	0.591***	0.405***
	(4.274)	(5.477)	(4.256)	(5.828)	(4.252)	(5.740)
Firm FE	YES	YES	YES	YES	YES	YES
SIC2 x Year FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.674	0.635	0.673	0.635	0.673	0.636
N	1,756	2,218	1,756	2,218	1,756	2,218

Notes: Gross profit margin refers to the ratio of gross profit and revenue. Return comovement refers to the average annual correlation of weekly stock market returns between firm and its local peers. Return comovement refers to the average annual correlation of weekly stock market returns between firm and its local peers. High exposure is a dummy indicator of the SIC 3-digit industry with the average "Exposure" being in the top tertile in 2013. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. High change in stock (and option) grants is a dummy indicator of the 3-digit SIC industry with the average change in stock (and option) grants to CEOs after 2013 being in the top tertile. Post is a dummy variable which is equal to one if the year is on or after 2013 or zero otherwise. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Explicit RPE indicates that the firm awarded CEO based on the relative performance evaluation in 2013. Controls include the lagged value of size, lagged value of sales growth, logarithm of CEO tenure and lagged value of logarithm of firm stock market return. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2007 to 2016. Standard errors are clustered at the firm level. Robust t-statistics are in parentheses.

Table IA14: Placebo test for peer performance sensitivity

	Ln(Total Compensation)		Ln(Cash Compensation)		Ln(Equity Compensation)	
ΔDistance x Post x Ln(Return)	0.000	0.000	-0.000	-0.000	-0.000	-0.000
	(1.193)	(1.442)	(-0.518)	(-1.017)	(-0.112)	(-0.208)
ΔDistance x Post x Ln(Local peer return)	-0.005	-0.003	-0.018	-0.028	-0.054	0.002
	(-0.441)	(-0.290)	(-1.012)	(-1.454)	(-0.879)	(0.020)
ΔDistance x Post	-0.009*	-0.009	-0.009	-0.015**	0.000	-0.000
	(-1.853)	(-1.651)	(-1.412)	(-2.564)	(0.014)	(-0.008)
Ln(Return)	0.173***	0.168***	0.241***	0.239***	-0.230	-0.192
	(4.133)	(3.473)	(3.636)	(3.469)	(-0.809)	(-0.584)
Ln(Local peer return)	0.060	0.054	0.096	0.042	-0.309	-0.181
	(1.305)	(1.078)	(1.057)	(0.338)	(-0.929)	(-0.539)
Local market	-0.013	-0.042	-0.028	-0.013	0.141	-0.020
	(-0.389)	(-1.288)	(-0.522)	(-0.188)	(0.710)	(-0.089)
ΔDistance x Ln(Return)	-0.000*	-0.000*	0.000	0.000	0.000	0.000
	(-1.974)	(-1.898)	(0.232)	(0.585)	(0.397)	(0.397)
Post x Ln(Return)	-0.029	-0.036	-0.037	-0.045	0.223	0.223
	(-0.660)	(-0.744)	(-0.505)	(-0.541)	(0.709)	(0.611)
ΔDistance x Ln(Local peer return)	0.006	0.008	0.008	0.022	0.068	0.028
	(0.895)	(1.204)	(0.499)	(1.114)	(1.154)	(0.364)
Post x Ln(Local peer return)	-0.066	-0.059	-0.065	-0.001	0.237	0.087
	(-1.041)	(-0.810)	(-0.765)	(-0.010)	(0.735)	(0.266)
ΔDistance x Local market	-0.010**	-0.006	-0.009	-0.008	-0.016	-0.006
	(-2.421)	(-1.333)	(-1.288)	(-0.837)	(-0.547)	(-0.188)
Post x Local market	-0.027	0.032	0.046	0.058	-0.115	0.058
	(-0.601)	(0.926)	(0.863)	(1.003)	(-0.577)	(0.272)
ΔDistance x Post x Local market	0.027***	0.017**	0.017*	0.013*	-0.002	-0.001
	(4.129)	(2.057)	(1.702)	(1.749)	(-0.055)	(-0.031)
Size_{t-1}	0.207***	0.203***	0.100**	0.104**	0.351**	0.403**
	(8.309)	(7.279)	(2.418)	(2.384)	(2.396)	(2.482)
$\text{Sales growth}_{t-1}$	0.117***	0.088***	0.101***	0.079**	0.122	0.173
	(4.261)	(3.614)	(3.046)	(2.177)	(0.813)	(1.085)
Ln(Tenure)	0.041*	0.042*	0.087***	0.086***	-0.097	-0.084
	(1.907)	(1.897)	(3.315)	(3.023)	(-1.473)	(-1.174)
Constant	6.379***	6.415***	6.334***	6.298***	3.691***	3.258***
	(32.218)	(30.024)	(19.757)	(18.707)	(3.480)	(2.710)
Year FE	YES	NO	YES	NO	YES	NO
Firm FE	YES	YES	YES	YES	YES	YES
SIC2 x Year FE	NO	YES	NO	YES	NO	YES
Adjusted R^2	0.735	0.743	0.728	0.736	0.557	0.562
N	11,917	11,893	7,224	7,201	7,220	7,197

Notes: The dependent variables are natural logarithm of one plus total compensation, cash compensation, and equity compensation. Post is a dummy variable which is one if the year is on or after 2008 or zero otherwise. ΔDistance is the increase in geographical distance between headquarter of a firm and a governing antitrust office after the closure of four field offices (Atlanta, Cleveland, Dallas, and Philadelphia) in 100 miles. Ln(Return) (Ln(Local peer return)) refers to natural logarithm of one plus annual stock market return of focal firm (local peer firms). Local market is an indicator for the presence of local peer firms. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Size is natural logarithm of one plus total assets. Sales growth is the annual percentage change in sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2003 to 2012. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Table IA15: Placebo test for equity compensation awards

	Stock grants		Option and stock grants	
Exposure x Post	-0.101	-0.092	-0.207**	-0.124
	(-1.135)	(-0.966)	(-2.134)	(-1.142)
Size_{t-1}	0.839	0.326	2.625**	1.587
	(0.871)	(0.361)	(2.237)	(1.341)
$\text{Sales growth}_{t-1}$	-1.160	-0.946	0.187	0.641
	(-1.527)	(-1.280)	(0.125)	(0.380)
Ln(Tenure)	-0.337	-0.288	-1.278*	-1.062
	(-0.579)	(-0.457)	(-1.770)	(-1.406)
Constant	2.491	6.380	-4.487	3.121
	(0.328)	(0.904)	(-0.489)	(0.351)
Year FE	YES	NO	YES	NO
Firm FE	YES	YES	YES	YES
SIC2 x Year FE	NO	YES	NO	YES
Adjusted R^2	0.276	0.296	0.279	0.294
N	8,814	8,795	8,812	8,793

Notes: Stock (and option) compensation refers to the ratio of stock (and option) grants divided by market capitalization multiplied by 10,000. Post is a dummy variable which is one if the year is on or after 2008 or zero otherwise. Exposure is the increase in geographic distance (in 100 miles) between headquarter of a firm and a governing antitrust field office after the closure of four field offices if the firm had local peer firms in 2012. Exposure is equal to zero if the firm had no local peer firms in 2012 or the distance to the governing antitrust office did not increase. We define local peer firms as the ones with Hoberg-Phillips product similarity score within the top 70% and headquartered within 200 miles from the focal firm. Size is natural logarithm of one plus total assets. Sales growth is the ratio of current year sales minus previous year sales and previous year sales. Ln(Tenure) is natural logarithm of the years since the executive assumes their CEO position. SIC2 x Year FE is joint fixed effect between year and industry with the same SIC 2-digit code. All the variables are winsorized at the 0.5% and 99.5% levels. The data spans from 2003 to 2012. Standard errors are clustered at the state level. Robust t-statistics are in parentheses.

Figure IA1: Economic trends of the treated and untreated states

Notes: These figures show the trends of economic and competition conditions of the affected and unaffected states. The affected states are the ones that experienced the closure of DoJ field offices, and the unaffected states are the other states. We leave out the two states that were covered by two field offices. The first three graphs show the average state-level GDP growth rate, unemployment rate, and net growth of the number of firms, respectively. The next three graphs show the following metrics constructed using the Hoberg-Phillips product similarity scores. For each firm, we calculate 1) the average similarity score of the 10 closest peers, 2) the number of peers with similarity scores exceeding 0.1, and 3) the number of local peers (headquartered within 200 miles) with similarity score exceeding 0.1. The graphs plot the mean value of each metric within a year and affected or unaffected states.