Trade Associations and Shared Industry Governance

Felipe Cabezon, Gerard Hoberg, and Ekaterina Neretina*

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Abstract

We propose that trade associations induce member firms to adopt executive compensation schemes that put higher weight on industry performance relative to firm performance. An extension to classical managerial effort theory predicts this outcome. We empirically test theoretical predictions and find strong support along five dimensions: (1) plausibly exogenous shifts in trade association memberships leads to less relative performance evaluation (RPE), (2) TA members avoid other members as RPE benchmarks but prefer them as compensation peers, (3) these results do not obtain for non-TA industry peers, (4) mechanism tests favor implicit implementation of pay contracts over visible contractual provisions, and (5) a quasi-natural experiment illustrates that the resulting incentive plans are highly effective. These results illustrate a new industry dimension of executive pay that incentivizes collaborative value creation.

*Felipe Cabezon (cabezon@vt.edu) is from the Virginia Tech Pamplin College of Business, Gerard Hoberg (hoberg@marshall.usc.edu) is from the University of Southern California Marshall School of Business, and Ekaterina Neretina (ekaterina.neretina@unibocconi.it) is from Bocconi University, Department of Accounting. Any errors are ours alone.

> *"Our 2024 Compensation & Benefits Report is the only [...] industry-specific resource for making informed business decisions about employee salary and benefits packages"*
>
> — National Systems Contractors Association's website.

> *"The paucity of RPE in options and other components of executive compensation remains a puzzle worth understanding."*
>
> — Kevin J. Murphy (1999)

Prior research suggests that significant value creation can occur at the industry level through the provision of shared investment that benefits multiple industry participants. Yet realizing these gains requires significant effort in the form of resources, managerial commitment, meetings to facilitate collaboration, relationship building, and more. We propose that trade associations help member firms to coordinate, but this also gives rise to a novel shared industry governance model that departs significantly from that predicted by the seminal single-firm principal-agent framework. The departures span many dimensions including executive pay but also other governance provisions. Our central contribution is to propose and analyze the shared industry governance model, and to empirically document its implementation, its link to trade associations, and its efficacy.

Our most central prediction of shared industry governance is a reduced focus on relative performance evaluation (RPE), which is the compensation of executives based on how well their firm performs relative to industry peers. Absent industry collaboration, RPE is theoretically compelling (Holmstrom 1982), as RPE reduces "pay for luck" when risk averse managers have no sway over the performance of peers. A long-standing puzzle in the literature is that, despite this compelling theoretical backing, RPE in actual explicit contracts does not appear to be highly prevalent in practice (Murphy 1999; Edmans, Gabaix, and Jenter 2017). Interest in RPE remains high in recent years, as for example, He, Whited, and Guo (2025) explore RPE dynamics in competitive markets where efficiency is important, and Dicks and Fulghieri (2025) suggest that ambiguity aversion can explain low levels of RPE.[1] A core part of our contribution is a new explanation for RPE's low relative prevalence based on the existence of the shared industry governance model, which predicts lower RPE as noted below.

We first present a simple theoretical model of optimal compensation that extends the seminal model of Holmstrom (1982) and derives the optimal compensation package (A) when firms are fully non-cooperative, (B) when firms can cooperate and gains to firm performance are possible through collaborative effort, and (C) when trade associations are necessary to facilitate cooperation and not all industry

[1] See Edmans, Gabaix, and Jenter (2017) for an excellent survey.

participants are members (consistent with empirical observations). The model predicts strong RPE in the absence of cooperation consistent with the literature. However, when gains to collaborative effort are possible, the optimal use of RPE declines. Lower RPE is necessary to incentivize managers to participate in producing the shared goods. The extended model also predicts that RPE will only be reduced relative to peers that specifically are members of trade associations. RPE measured relative to non-trade-association peers continues to be optimal. Finally, we discuss additional tradeoffs important to shared governance regarding broader governance policies, stability of management teams and stability of governance policies. Our theoretical framework is ideally suited to our empirical framework based on the trade association $\times$ firm member $\times$ year framework of Hoberg and Neretina (2023), which dynamically tracks firm memberships from trade association websites using the Wayback Machine. The model's core and more nuanced predictions are testable, and we find strong support.

The provision of industry-level incentives is controversial on two dimensions. First, the US Department of Justice and the Federal Trade Commission explicitly note concerns about such practices as they can incentivize collusion. Second, activists and proxy advisory firms favor the view that RPE is optimal, and pay packages that intentionally incentivize industry rather than RPE can generate investor backlash and negative proxy advisory recommendations. A consequence is that the shared governance model is likely best implemented using implicit pay mechanisms rather than direct and fully observable contractual provisions (Jensen and Murphy 1990 and Gibbons and Murphy 1990 were first to discuss and test the concept of implicit pay mechanisms). Such implicit mechanisms can deliver industry incentives without excessive scrutiny, allowing firms to achieve higher valuations through collaboration. Yet the lack of transparency could entail other risks worthy of future research. The importance of RPE to regulatory agencies and investment practitioners further motivates the importance of this research.

The existing literature provides little insight regarding the role of trade associations, and we are not aware of any studies proposing significant influences on governance practices. This is likely due to the absence of systematic panel databases allowing for the study of trade associations along with the endogeneity challenges of studying collaborative entities. We follow Hoberg and Neretina (2023) (HN) and use a large trade association $\times$ firm members $\times$ year panel database constructed by web-scraping trade association websites and entity recognition tools. This comprehensive database allows us to model the influence of trade associations in a dynamic setting. Our study mitigates endogeneity concerns by using the network instruments used in HN along with a second quasi-natural experiment relating to the removal of tax incentives for incentive pay in the U.S.

Our first empirical test uses direct measures of RPE from the Incentive Lab database to study how

RPE changes in the presence of trade associations. We use the network-homophily instruments from Hoberg and Neretina (2023) and run this test using a two stage instrumental variables model. The two instruments are based on trade association adoption by firm peers that either share geography or board overlaps, but yet are not in the same industry (broadly defined) as the focal firm. This ensures no contamination from unobservable state variables at the industry level while allowing for a strong signal relating to likely social interactions (where information about TA benefits is shared) among homophily peers within these networks. While these instruments have some limitations (discussed later), their construction rules out a significant number of omitted variables. We find that shifts in trade association memberships lead to significantly reduced RPE using either of the two instruments. Moreover, this reduced RPE pay is especially sharp relative to peers that are members of trade associations. Perhaps remarkably, RPE is not significantly reduced for industry peers that are not members of trade associations. Further suggesting intentional design beyond RPE pay amounts, we also find that peers are less likely to be chosen as RPE evaluation peers when they are more influenced by TAs. These results fully support the predictions of our theoretical model and illustrate a central point of departure of the shared governance model from the firm-specific governance model in the literature.

We next explore the impact of trade associations on implicit RPE pay. In particular, we explore the link between ex-post realized pay and the stock returns of various peers during the given fiscal year, especially those peers who are members of trade associations. This regression framework was pioneered by Gibbons and Murphy (1990), and is a strong test of implicit RPE because final ex-post pay should reflect any measures a firm might take to implement shared industry governance, even if the payment reflects implicit or informal agreements not seen in the formal compensation contracts. We intuitively find a strong link between the returns of industry peers and ex-post pay that fully supports our predictions. When we examine the impact of industry peer stock returns overall (controlling for focal firm returns), we find the expected negative coefficient indicating higher RPE unconditionally. Yet the sign flips to a significant positive impact when we consider the pay impact of returns of association peers. Remarkably, the sign reverts to a negative one when we further consider the returns of non-association peers. These results fully support the shared governance model predictions while also illustrating the refined nature of its impact.

Especially because evidence suggests that impact on ex-post pay is implicit, we next explore the likely mechanisms firms use to implement increased industry incentives. Our first analysis examines the impact of trade associations separately on the eight reported components of pay. Although these components are explicit and observable in contracts, some components offer managers more discretion. For example, we find that trade associations induce compensation that loads more on discretionary bonuses. Other components naturally load less on RPE than others. For example, we find that associations induce an increased use of options and restricted stock but less use of performance stock. The institutional details regarding these components support the conclusion that these shifts in pay favor reduced RPE while also avoiding the need to state explicitly that pay is an increased function of industry peer performance in disclosed compensation information. We also find the more nuanced prediction of our theoretical model that associations also induce higher compensation overall but with a higher loading on incentive components. Our model predicts this is necessary due to the more intense effort profiles required under industry governance.

We also hypothesize that boards might further implement implicit industry incentives by increasing the manager's pay in years following stronger industry performance (even controlling for own-firm performance), as suggested by Jensen and Murphy (1990). We indeed find strong and consistent results as boards increase pay package size when trade association peers perform well, and decrease pay package size when non-association peers perform well. These results are directly predicted by our model, and are consistent with boards extracting higher effort from managers by offering pay increases if managers deliver on increased industry performance specifically for collaborating association peers. As we fully control for own-firm performance, these gains are novel and are over and above any firm-specific incentives. Supporting the low-transparency approach we observe broadly, boards appear able to implement this mechanism without any material disclosed contractual agreements.

We also test whether our results are stronger when the incentives to adopt shared industry governance are stronger. We focus on the 4-stage product life cycle of Hoberg and Maksimovic (2022), and find that our results are stronger when firms are focused on process rather than product innovation, and when firms are in the mature stable stage of the life cycle. The results for the process innovation echo trade associations' well-known primary objective of improving efficiency. In particular, collaborators can pay the costs of discovering efficiency gains just once as a group rather than each firm having to make these investments on its own. The mature firm life cycle stage is associated with stable markets, which is also ideal for industry collaboration as gains are long-term in nature and collaboration requires relationship-building, which is a long-term asset. These results illustrate that some firms are intuitively more likely to adopt shared governance than others.

As the shared governance hypothesis has predictions for governance beyond pay alone, we next examine broader aspects of governance. We focus on the prediction that stability of the governance framework is important for shared governance given its long-term nature as noted above. We find that trade associations lead to five important shifts in governance beyond our baseline results: (1) pay awards have longer vesting times, (2) classified boards are adopted with higher frequency, (3) disruptive hostile transactions within the industry are less prevalent (4) board overlaps become more prevalent likely to maximize long-term relationship value, and (5) firms abnormally choose association peers over non-association peers as compensation benchmark peers and even use the same compensation consultant more often. These results emphasize the importance of stable leadership and governance, information flows and connectedness in maximizing collaborative gains.

Our final test explores the efficacy of incentives that target the industry rather than the firm. Do such collaborative incentives achieve the intended goal of improved performance? We consider a plausibly exogenous shock in 2017 (Tax Cuts and Jobs Act TCJA) that removes the tax deduction previously granted to components of executive pay that were incentive-based (such as options and performance-based awards but not fixed salary). This is a plausibly exogenous shock decreasing incentive pay levels for all firms. Assuming firms scale back incentives roughly proportionally (akin to a Bartik assumption), it follows that firms following the industry governance model will experience reduced industry performance ex post while those following the firm-specific governance model should experience reduced firm-specific performance. We thus adopt a two-stage least squares approach and find supportive results on many dimensions of performance. When firms are more exposed to trade associations ex-ante, the shock reducing incentive pay results in reduced ex-post industry-level sales growth, ROE, innovative investment, and advertising. Similarly, firms less exposed to trade associations ex-ante experience analogous reductions in firm-specific performance as expected. These results are consistent with the incentives being effective.

We also note three limitations and related directions for future research. First, although industry governance might induce collusion, we do not explore collusion in this study for two reasons. The first is that our objective is to propose the existence of a previously undocumented industry governance model and empirically explore its mechanisms and efficacy. A proper treatment of collusion requires a separate dedicated study. Second, our theory applies regardless of whether value creation occurs through efficiency channels or anti-competitive market power channels. In particular, our theory only requires the existence of valuation gains at the industry level that require joint managerial effort. Hence, collusion is not a crucial factor in our motivation.[2]

A second limitation is that our trade association membership instruments cannot fully address endogeneity concerns. Yet their design, which is based on fully out-of-industry peer influences, specifically

[2] For readers interested in how collusion affects the sensitivity of executives' pay to rivals' performance, see Ha, Ma, and Žaldokas (2024).

excludes the most important potential confounder: unobservable industry-level state variables. We also note that our instruments produce strong first stage results, pass conventional validity tests, and that prior work further documents their robustness (Hoberg and Neretina (2023)). Our inclusion of rigid fixed effects and our novel exploration of the 2017 TCJA as a separate shock add additional external validation. Yet we believe future research exploring other sources of exogenous variation remains fruitful. A third limitation is that, although we document implicit mechanisms of industry governance, the lack of transparency we document also limits our ability to fully observe all channels. Future research exploring other dimensions of industry governance also remains fruitful.

1 Literature Review

The theoretical foundation for RPE in executive compensation goes back to Holmstrom (1982), who shows that filtering out common shocks through RPE reduces risk borne by risk-averse managers while preserving incentives. This insight predicts that RPE should be an ubiquitous feature of executive pay, especially when managers face uncertainty beyond their control. Despite this compelling foundation, empirical evidence reveals that RPE is less prevalent in practice than theory predicts. Early studies found weak support for explicit RPE provisions in compensation contracts (Antle and Smith 1986; Janakiraman, Lambert, and Larcker 1992), though Gibbons and Murphy (1990) document evidence of implicit RPE affecting both compensation and retention decisions. Aggarwal and Samwick (1999) find that contracts incorporate risk-sharing benefits but fail to exploit RPE's informational advantages. More recent work shows that RPE usage also depends critically on choosing more economically appropriate peers (Albuquerque 2009; Gong, Li, and Shin 2011; Jayaraman et al. 2021). Overall, the evidence suggests that explicit RPE provisions are substantially less common than standard theory suggests, and while implicit RPE shows more evidence of usage, it too appears less prevalent than theoretical predictions would indicate (Murphy 1999; Edmans, Gabaix, and Jenter 2017).

Several explanations have been proposed for RPE's limited adoption. Garvey and Milbourn (2003) suggest that executives can replicate RPE in their personal portfolios, reducing the need for contractual provisions. Bertrand and Mullainathan (2001) suggest the lack of RPE could be due to the prevalence of "pay for luck" rather than performance in compensation contracts. Gopalan, Milbourn, and Song (2010) argue that boards might avoid RPE to preserve managerial incentives for optimal sector exposure. More recently, Nurisso (2025) shows that positive externalities from passive investing can make RPE suboptimal among firms in the same index, while Dicks and Fulghieri (2025) explain low firm RPE through uncertainty-aversion. We contribute to this literature by proposing a new explanation: when firms collaborate through trade associations, optimal contracts depart from traditional RPE predictions. Our shared industry governance framework predicts systematically lower RPE specifically against trade association peers, offering a new (and non-mutually-exclusive) mechanism with strong support.

A vast literature also examines how RPE shapes managerial behavior across multiple dimensions. For example, Schäfer (2023) shows that RPE contracts induce CEOs to avoid strategic differentiation and increase correlation with peers, consistent with Gopalan, Milbourn, and Song (2010)'s predictions about sector exposure choices. RPE also affects information disclosure, with Bloomfield, Heinle, and Timmermans (2024) documenting that RPE firms strategically disclose information harming competitors' stock prices, while Martin and Timmermans (2025) find that RPE reduces voluntary disclosure. The competitive implications are nuanced: He, Whited, and Guo (2025) develop a dynamic model showing RPE can either intensify or weaken competition depending on market size and firm efficiency. Bloomfield, Marvao, and Spagnolo (2023) further shows that, since RPE can incentivize costly sabotage, firms are more likely to adopt it in cartel settings when the potential for sabotage is lower. In contrast, Ha, Ma, and Žaldokas (2024) shows that when antitrust enforcement weakened, firms increase the sensitivity of CEO pay to local rivals' performance (although this finding is based on pay sensitivity and not explicit RPE). Recent work explores ownership structure with mixed evidence. Antón et al. (2023) find that common ownership reduces RPE, while Bloomfield, Friedman, and Kim (2024) do not find this relationship. Our focus is distinct and explores shared industry governance and industry collaboration through trade association peers.

1.1 Institutional Background

Coordination by firms in trade associations to maximize valuations and convergence to common industry practices naturally translates into firms adopting industry-tied compensation models. Firms in a given industry are connected through shared technologies, input markets, and regulatory environments. This creates inter-dependencies that individual firms cannot fully address. Trade associations arise as intermediaries that organize and promote these inter-dependencies, providing stable forums in which firms exchange information, address common challenges, and develop industry standards (Warford, May, and Klein (1923), Galambos (1966), Varroney (2022), Hoberg and Neretina (2023)).

Because industry collaboration requires aligned managerial incentives, trade associations can also play a governance role in guiding compensation practices that support collective industry outcomes. In addition to this governance role, trade associations also facilitate the exchange of compensation information, which can further collaborative agendas, as members observe common industry statistics and trends and might share references to work with the same compensation consultants. This might induce common practices to maximize overall performance of members as a group when setting compensation packages. For example, trade associations often commission compensation benchmarking surveys and disseminate the results to their industries. The American Bankers Association (ABA) conducts such annual surveys and disseminates statistics to the industry. This is done for example in its Executive Compensation and Benefits Trend Report.[3] Another example is the Compensation and Benefits Report that the National Systems Contractors Association (NSCA) distributes to top executives in the industry. This report explicitly aims to share information on compensation trends, benchmarking packages, and informing compensation-setting decisions.[4]

Such information exchange among industry competitors can facilitate the adoption of industry governance compensation practices despite the fact that such practices might face regulatory scrutiny, and are subject to anti-collusion rules. This is noteworthy as U.S. antitrust law prohibits coordination on compensation and employment practices.[5] Regulators do, however, allow limited sharing of aggregated, historical, or anonymized data through neutral channels:

> [...] *information reporting cost or data other than price, and historical data rather than current or future data, is less likely to raise antitrust concerns. Dissemination of aggregated data managed by an independent third party also raises fewer concerns.*[6]

In practice, trade associations gather and disseminate compensation information in line with these rules. They often collect compensation data through independent intermediaries and distribute anonymized aggregate figures. With respect to the previous examples, both ABA and NSCA explicitly state that they collect this information through independent consulting and research firms, and their reports highlight aggregate statistics and industry trends.

Given that trade associations promote industry-level collaborations that require effort, it is natural that they would endorse compensation practices that put higher weight on industry performance. Indeed anecdotal evidence indicates that member firms actively participate in trade association activities. Based

[3] 2024 NFP US Executive Compensation and Benefits Trend Report, *NFP, an Aon Company*, 2024. NFP is the consulting company hired by the ABA to conduct the survey. https://www.aba.com/news-research/analysis-guides/2024-nfp-us-executive-compensation-and-benefits-trend-report

[4] Compensation & Benefits Report, 2024, *National Systems Contractors Association (NSCA)*. https://www.nsca.org/compensation-benefits-report-2024/

[5] Antitrust Guidelines for Business; Activities Affecting Workers, *U.S. Department of Justice and the Federal Trade Commission*, Revised: January 2025.

[6] Spotlight on Trade Associations https://www.ftc.gov/advice-guidance/competition-guidance/guide-antitrust-laws/dealings-competitors/spotlight-trade-associations

on trade association websites, for example, the American Bankers Association (ABA), the Biotechnology Innovation Organization (BIO), the Electronic Transactions Association (ETA), the Methanol Institute (MI), and many others rely on member involvement in the governance of the associations themselves. Members thus shape policy positions, address industry challenges, and meet with policymakers.[7] Furthermore, member involvement is frequently carried out by firms' top executives. For example, BIO and ETA list firm CEOs and other senior executives as members of their boards.[8]

While coordination by trade associations can induce firms to adopt more industry-focused compensation models and therefore less RPE, a separate matter is that such explicit shifts away from RPE-based pay structures can face resistance from the investor side. Both Institutional Shareholder Services (ISS) and Glass Lewis (GL), the proxy advisory firms, recommend RPE-tied compensation. Investor preferences align with these recommendations. GL explicitly states "executive compensation should be closely tied to a company's track record of performance relative to its peers," and ISS has emphasized that "investor feedback on the issue of pay-for-performance indicates a preference for [...] pay relative both to market peers and company performance."[9] In fact, the evaluation of equity compensation plans by major investors such as BlackRock is largely based on "a company's executive pay and performance relative to peers."[10]

Taken together, regulatory scrutiny and investor preferences create disincentives for firms to explicitly deviate from conventional RPE-style compensation plans. Yet compensating the effort needed for collaborative activities such as those managed by trade associations requires doing just that. Firms can face regulatory risk if coordination in pay is explicit and shareholder governance risk if contracts visibly deviate too much from RPE. These constraints make it difficult to implement the industry-aligned incentives that are theoretically optimal under collaboration (we illustrate theoretical optimality in the next section). These institutional conditions thus predict that the industry governance model we propose is likely implemented using implicit pay mechanisms rather than through explicit publicly observable

[7] ABA's page on member involvement states "ABA's daily work and policy positions are guided by the input of member bankers who serve on our committees." (https://www.aba.com/experts-peers/committees-councils); ETA's page states "Our member-led committees and working groups representing over 500 member companies collaborate on key issues to address business challenges and advance the technology, safety, and security of payments." (https://electran.org/about-us/); BIO describes "100 BIO members Fly-In to discuss biotech priorities on Capitol Hill" (https://www.bio.org/gooddaybio-archive/bio-capitol-hill); MI's page states "Our programmatic activities are driven by member-led committees [...]" (https://methanol.org/about-us/).

[8] https://www.bio.org/about/bio-leadership/board-directors; https://electran.org/about-us/board-of-directors/.

[9] Pay for Performance Methodology & FAQ, *Glass Lewis*, 2025; Pay-for-Performance Mechanics: ISS' Quantitative and Qualitative Approach, *ISS*, December 16, 2024.

[10] BlackRock Investment Stewardship. Proxy Voting Guidelines for Benchmark Policies – U.S. Securities, *BlackRock*, January 2025.

contracts.

1.2 Simple Model

The intended role of industry-focused trade associations is to facilitate positive collaboration among industry peers. We hypothesize that managerial incentives serve as a mechanism to reinforce and optimize such collaboration. To formalize this hypothesis, we develop a simple model of executive compensation and moral hazard. Specifically, we consider the canonical managerial incentive design problem with moral hazard and relative performance evaluation (RPE) (Holmstrom and Milgrom (1987)), and extend it to a setting in which the existence of an industry-wide opportunity can only be achieved through shared collaboration that requires effort (and thus incentives are important).

1.2.1 Baseline Model: No Trade Associations

We begin with the standard principal-agent model with RPE but no trade associations (we add TAs to the model in the next subsection). A risk-neutral principal designs compensation for a risk-averse agent with CARA utility and risk aversion coefficient r, who chooses unobservable effort a at quadratic cost $\psi(a) = \frac{ca^2}{2}$. The agent's utility is, therefore, $Up[a, \tilde{w}] = -\exp(-r(\tilde{w} - \psi(a)))$. We define $\tilde{w}$ as the agent's compensation, which has a random component due to its link to firm performance. Firm performance, $\tilde{x}$, depends on effort and a random shock: $\tilde{x} = a + \tilde{\epsilon}$ where $\tilde{\epsilon} \sim N(0, \sigma_x^2)$. Analogously, peer firm performance is $\tilde{\bar{x}} = \bar{a} + \bar{\epsilon}$ where $\bar{\epsilon} \sim N(0, \sigma_{\bar{x}}^2)$. Since focal firms and peer firms belong to the same industry, we assume $\text{Cov}(\tilde{\epsilon}, \bar{\epsilon}) = \sigma_{x\bar{x}}$.

Given the agent's exponential utility, the risk-neutral principal, and normally distributed noise, following Holmstrom and Milgrom (1987), the optimal linear contract takes the form:

$$\tilde{w} = \alpha + \beta\tilde{x} - \gamma\tilde{\bar{x}}$$

where α is fixed compensation, β is pay-for-performance sensitivity, and γ is RPE intensity.

Using properties of the exponential utility function with normal distributions, the agent's expected utility can be expressed as a certainty equivalent: $CE = \alpha + \beta a - \gamma\bar{a} - \frac{ca^2}{2} - \frac{r}{2}\text{Var}(\tilde{w})$, where the variance of compensation is: $\text{Var}(\tilde{w}) = \beta^2\sigma_x^2 + \gamma^2\sigma_{\bar{x}}^2 - 2\beta\gamma\sigma_{x\bar{x}}$. The agent chooses the level of effort that maximizes this certainty equivalent: $\frac{\partial CE}{\partial a} = \beta - ca = 0 \quad \Rightarrow \quad a^* = \frac{\beta}{c}$. Intuitively, this optimal effort is proportional to the pay-for-performance sensitivity β. Higher β induces more effort, but at a cost: it also increases the variance of the agent's compensation, exposing the risk-averse agent to more risk. This optimal effort choice is, of course, conditional on accepting the contract. The participation constraint requires that the agent's certainty equivalent is greater than or equal to the reservation utility (normalized to zero). In equilibrium, it will be precisely zero as the principal will extract the agent's surplus, and hence we have: $\alpha + \beta a^* - \gamma\bar{a} - \frac{c(a^*)^2}{2} - \frac{r}{2}\text{Var}(\tilde{w}) = 0$.

Substituting $a^* = \frac{\beta}{c}$ and solving: $\alpha = \gamma\bar{a} - \frac{\beta^2}{2c} + \frac{r}{2}(\beta^2\sigma_x^2 + \gamma^2\sigma_{\bar{x}}^2 - 2\beta\gamma\sigma_{x\bar{x}})$. The fixed wage α compensates the agent for the cost of effort ($\frac{\beta^2}{2c}$), the risk premium ($\frac{r}{2}\text{Var}(\tilde{w})$), and adjusts for the effect of RPE on expected compensation ($\gamma\bar{a}$). Taking all this into account, the principal determines the α, β, and γ that maximize its expected profit: $E[\pi] = E[\tilde{x} - \tilde{w}] = a^* - \alpha - \beta a^* + \gamma\bar{a} = \frac{\beta}{c} - \frac{\beta^2}{2c} - \frac{r}{2}(\beta^2\sigma_x^2 + \gamma^2\sigma_{\bar{x}}^2 - 2\beta\gamma\sigma_{x\bar{x}})$.

Taking first-order conditions, $\frac{\partial E[\pi]}{\partial\beta} = 0$ and $\frac{\partial E[\pi]}{\partial\gamma} = 0$, and defining the idiosyncratic risk as $\sigma_{idio}^2 = \sigma_x^2 - \frac{\sigma_{x\bar{x}}^2}{\sigma_{\bar{x}}^2}$, which represents the variance of the focal firm's performance after filtering out the component correlated with peer performance, we obtain our baseline model solution:

$$\beta^* = \frac{1}{1 + rc\sigma_{\text{idio}}^2}; \;\; \gamma^* = \frac{\beta^*\sigma_{x\bar{x}}}{\sigma_{\bar{x}}^2} = \frac{\sigma_{x\bar{x}}}{\sigma_{\bar{x}}^2(1 + rc\sigma_{\text{idio}}^2)}; \;\; \alpha^* = \gamma^*\bar{a} - \frac{(\beta^*)^2}{2c} + \frac{r}{2}((\beta^*)^2\sigma_x^2 + (\gamma^*)^2\sigma_{\bar{x}}^2 - 2\beta^*\gamma^*\sigma_{x\bar{x}})$$

All the standard RPE implications emerge from this baseline model. First, γ^* is non-negative, implying that the agent is penalized when peers perform well. This is the essence of RPE. By comparing the focal firm's performance to peer performance, the principal can filter out common shocks and reduce the risk the agent bears. This risk reduction, in turn, allows the principal to provide stronger incentives (higher β). Second, the pay-for-performance sensitivity β^* depends on idiosyncratic risk σ_{idio}^2, not total risk σ_x^2. The more effectively RPE filters out common shocks (i.e., the smaller σ_{idio}^2 relative to σ_x^2), the stronger the incentives the principal can provide. When $\sigma_{x\bar{x}} = 0$ (no common shocks), we have $\sigma_{idio}^2 = \sigma_x^2$ and RPE provides no benefit. When $\sigma_{x\bar{x}}$ is large relative to σ_x^2 and $\sigma_{\bar{x}}^2$ (highly correlated shocks), RPE substantially reduces risk and allows for much stronger incentives.

1.2.2 Extended Model: Trade Association Effects

We now extend the baseline model to incorporate trade associations. The key innovation is that some peers are trade association members who jointly invest in an industry-wide opportunity, while other peers remain outside the association. We modify the baseline model in two ways. First, the agent now has to decide on two types of effort: firm value effort (a_1) that directly increases firm performance, and collaborative opportunity effort (a_2) that contributes to an industry-wide benefit. The cost of total effort becomes $\psi(a_1, a_2) = \frac{1}{2}(c_1 a_1^2 + c_2 a_2^2)$.[11]

[11] To simplify the model, we assume the costs of both efforts are independent of each other.

Second, the focal firm belongs to a trade association with N peer firms. All trade association members invest in a common industry-wide opportunity, A_2, whose value is the sum of the collaboration effort of all the TA firms: $A_2 = \sum_{i=0}^{N} a_{2,i}$, where $i = 0$ denotes the focal firm. By symmetry, $A_2 = (N+1)a_2^*$ in equilibrium. Additionally, there also exist non-trade-association firms that serve as RPE benchmarks but do not contribute to the industry-wide opportunity. Therefore, firm performance depends on both individual effort and the collective industry opportunity:

$$\text{Focal firm: } \tilde{x} = a_1 + \lambda A_2 + \tilde{\epsilon}$$

$$\text{TA peer } i\text{: } \tilde{x}_{TA,i} = a_{1,i} + \lambda A_2 + \tilde{\epsilon}_{TA,i}$$

$$\text{Non-TA peer } j\text{: } \tilde{x}_{nonTA,j} = a_{1,j} + \tilde{\epsilon}_{nonTA,j}$$

where $\lambda \geq 0$ represents the net industry-wide benefit after considering all potential collaboration costs (e.g., certification, brand enhancement, lobbying efforts, data sharing, identification of new growth opportunities, etc.),[12] and all noise terms are $\epsilon \sim N(0, \sigma^2)$ with $\text{Cov}(\epsilon_i, \epsilon_k) = \sigma_{x\bar{x}}$ for $i \neq k$.

Therefore, the optimal contract now includes two RPE terms: $\tilde{w} = \alpha + \beta\tilde{x} - \gamma_{TA}\bar{\tilde{x}}_{TA} - \gamma_{nonTA}\bar{\tilde{x}}_{nonTA}$, where γ_{TA} is the RPE intensity against trade association peers and γ_{nonTA} is the RPE intensity against non-trade-association peers. These intensities can be positive or negative.

Similar to the baseline model, the agent chooses efforts a_1 and a_2 to maximize the certainty equivalent: $CE = \alpha + (\beta - \gamma_{TA})a_1 + (\beta - \gamma_{TA})\lambda(N+1)a_2 - \gamma_{nonTA}a_1^* - \frac{1}{2}(c_1 a_1^2 + c_2 a_2^2) - \frac{r}{2}\text{Var}(\tilde{w})$, where $\text{Var}(\tilde{w}) = (\beta^2 + \gamma_{TA}^2 + \gamma_{nonTA}^2)\sigma^2 - 2(\beta\gamma_{TA} + \beta\gamma_{nonTA} - \gamma_{TA}\gamma_{nonTA})\sigma_{x\bar{x}}$.

The optimal efforts are therefore: $a_1^* = \frac{\beta - \gamma_{TA} - \gamma_{nonTA}}{c_1}$; $a_2^* = \frac{\lambda(N+1)(\beta - \gamma_{TA})}{c_2}$. Intuitively, the firm-value effort, a_1^*, depends on the net incentive rate after accounting for RPE against both types of peers. The collaborative effort, a_2^*, depends only on $(\beta - \gamma_{TA})$, not on γ_{nonTA}, because non-trade-association peers do not contribute to the industry-wide opportunity and therefore their performance does not reflect the agent's collaborative effort.

The principal chooses β, γ_{TA}, and γ_{nonTA} to maximize expected profit subject to the agent's participation constraint. The participation constraint determines the fixed wage α that makes the agent willing to accept the contract. Substituting the agent's optimal efforts and solving the principal's optimization

[12] For parsimony, we do not consider an explicit collaboration cost for the firm (direct costs of being a trade association member (e.g., fees, paperwork, time spent in meetings, etc) and indirect costs (e.g., lower shareholders' support, risk of activism, anti-trust scrutiny, etc). However, our results are similar if we introduce a quadratic cost of collaboration: $\frac{ka_2^2}{2}$.

problem we obtain the extended model solution:

$$\beta^* = \frac{(1+N)^2\lambda^2(1+c_1r\sigma^2)+c_2r(\sigma^2-\sigma_{x\bar{x}})}{2(1+N)^2\lambda^2(1+c_1r\sigma^2)+c_2r(\sigma^2-\sigma_{x\bar{x}})(3+c_1r(\sigma^2+2\sigma_{x\bar{x}}))}$$
$$\gamma^*_{TA} = -\frac{(1+N)^2\lambda^2(1+c_1r\sigma^2)+c_2r(\sigma^2-\sigma_{x\bar{x}})}{2(1+N)^2\lambda^2(1+c_1r\sigma^2)+c_2r(\sigma^2-\sigma_{x\bar{x}})(3+c_1r(\sigma^2+2\sigma_{x\bar{x}}))}$$
$$\gamma^*_{nonTA} = \frac{r(2c_1(1+N)^2\lambda^2\sigma_{x\bar{x}}-c_2(\sigma^2-\sigma_{x\bar{x}}))}{2(1+N)^2\lambda^2(1+c_1r\sigma^2)+c_2r(\sigma^2-\sigma_{x\bar{x}})(3+c_1r(\sigma^2+2\sigma_{x\bar{x}}))}$$

We obtain several economic insights from the model. First, there is a negative RPE against trade association peers ($\gamma^*_{TA} < 0$). This represents a fundamental departure from the baseline model where $\gamma^* > 0$. When trade association peers succeed, the focal firm's agent also benefits. The optimal contract, therefore, includes a *collaboration bonus* that internalizes these positive externalities and amplifies incentives for industry-wide investment beyond what pay-for-performance (β) alone provides. Note that, due to the symmetry in determining the collaborative opportunity, $\gamma^*_{TA} = -\beta^*$: motivating own firm performance and TA peers' performance have identical effects on the agent's contribution to the collaborative opportunity.

Second, there is a positive RPE against non-trade-association peers ($\gamma^*_{nonTA} > 0$). Non-TA peers do not contribute to the industry-wide collaborative opportunity and serve purely as benchmarks to filter common noise, as in the baseline model. The principal, therefore, uses them for traditional RPE to reduce compensation risk without undermining collaboration incentives. Third, the addition of trade associations will result in higher total performance-based pay. Compared to the baseline model without trade associations, the combined incentive intensity is higher because firms must motivate both firm value effort and industry-wide effort ($\beta^* + |\gamma^*_{TA}| > \beta^*_{baseline}$). Lastly, we also note that *collaboration benefits* increase with industry-wide value ($\frac{\partial|\gamma^*_{TA}|}{\partial\lambda} > 0$). When the benefit of collaboration (λ) is greater, firms increase collaboration incentives by making γ_{TA} more negative.

These economic insights guide our empirical investigation. Overall, the model predicts that trade associations lead to reduced competitive benchmarking among members and collaboration incentives to encourage valuable coordination. We thus expect firms in trade associations to exhibit reduced RPE against trade association peers. This can be implemented in many ways, for example by strategically selecting compensation peers to avoid TA peers. We document other implementation methods such as implicit-benchmarking later in this study. We hypothesize that firms implement these collaboration bonuses through compensation components that are less costly to implement. We also expect the collaboration incentives to be stronger when the collaboration value is larger. Finally, we also predict that mechanisms to enhance the value of collaboration: such as corporate governance structures promoting long-term stability, which should be more prevalent among trade association members. We thus focus on four main predictions that we test empirically:

1. **Reduced RPE against TA peers**: Trade association membership should reduce the use of explicit RPE metrics based on TA peer performance, and reduce implicit RPE sensitivity to TA peer returns ($\gamma^*_{TA} < 0$).

2. **Maintained RPE against non-TA peers**: The addition of trade associations will not affect RPE benchmarked against non-TA peers, which continue to serve their optimal role of filtering pay-for-luck from the incentive plan ($\gamma^*_{nonTA} > 0$).

3. **Changes in pay structure**: Trade associations should increase total incentive intensity and shift compensation toward components that can specifically induce industry collaboration ($\beta^* + |\gamma^*_{TA}| > \beta^*_{baseline}$).

4. **Stronger effects for high-value collaborations**: The reduction in RPE against TA peers should be more pronounced when collaboration benefits are larger ($\frac{\partial|\gamma^*_{TA}|}{\partial\lambda} > 0$).

2 Data and Methodology

In this section, we begin by describing our data sources and sample construction. We then present our main empirical specifications.

2.1 Data

We use multiple data sources to construct an executive-firm-year database. We use compensation data from ISS Incentives Lab, which includes detailed compensation plan information for CEOs and other Named Executive Officers (NEOs) (usually the top 5 highest-paid executives). We obtain trade associations data from Hoberg and Neretina (2023). This dataset identifies firm-specific association memberships using entity-recognition textual analysis methods based on public company name mentions on the annual websites of every U.S. national trade association in every year. Annual websites were obtained using the Wayback Machine. Additionally, we use the 10-K Text-based Network Industry Classification (TNIC) to identify firms in the same industry, and CRSP/COMPUSTAT for accounting and firm data. We link all data to firm IDs (GVKEY) using historical CUSIPs, and we winsorize all variables at 1% and 99% levels. Our sample covers 150,744 executive-firm-year observations from 1999 to 2023.

2.2 Methodology

Our initial analysis is focused on examining the effect of trade associations on RPE and managerial incentives. Because joining a trade association is an endogenous decision that may correlate with unobservable firm characteristics, we cannot rely on OLS estimation. Instead, we focus our analysis on the two instrumental variables for association memberships developed by Hoberg and Neretina (2023).

The first instrument leverages geographic proximity and size homophily to construct a plausibly exogenous measure of trade association exposure. For each firm, this instrument identifies other firms that are (1) located within 100 miles, (2) not in the same industry sector, and (3) of similar size within ten times size difference (homophily assumption). The instrument is then computed as the weighted-average number of association memberships among these geographically proximate, similarly-sized firms in different sectors, with the weights inversely proportionate to the size differences (further homophily assumption). The second instrument uses out-of-sector director networks to measure trade association exposure. For each firm, this instrument identifies firms that satisfy two conditions: (1) they are connected through director links based on overlapping board seats, employment, education, or social clubs, (2) they are not in the same industry sector. The instrument captures the weighted-average number of association memberships among these network-connected peer firms, with the weights again inversely proportionate to the size differences.

The exclusion restriction for both instruments relies on these firms operating in entirely different sectors, making it unlikely that their association memberships directly correlate with the focal firm's omitted variables that might be related to compensation design. The economic sectors are defined at the broad TNIC2 industry level of Hoberg and Phillips (2010, 2016) TNIC network, which roughly correspond to the two-digit SIC code by granularity. The instruments satisfy the relevance condition because geographic diffusion (first instrument) and director network connections (second instrument) facilitate the diffusion of information about the benefits of trade association membership (and our instruments achieve F-statistics well-exceeding the conventional 10.0 threshold).

We use the second-stage predicted value of trade association memberships as our main independent variable in the 2SLS framework, and we examine both instruments separately to ensure robustness. Our baseline regression specification is described in equation (1) below:

$$\text{DEP}_{ijt} = \alpha_0 + \beta_1 \widehat{\#\text{memberships}}_{j,t-1} + \ \delta \text{Controls}_{j,t-1} + \mu_{ij} + \gamma_{spt} + \epsilon_{it}. \tag{1}$$

Our coefficient of interest is β_1, which reflects the role of trade associations in shaping compensation characteristics. In all of our estimations, we include executive $\times$ firm fixed effects (μ_{ij}). Therefore, the estimation considers only within-executive and firm variation. These fixed effects absorb any unobservable time-invariant executive and firm characteristics that might affect the dependent variable. We also include granular industry $\times$ position $\times$ year fixed effects (γ_{spt}) using four-digit SIC codes, and we define the executive's position as CEO, CFO, director, or other. These additional fixed effects absorb any time-variant omitted variables that depends on the firms' industry or the executive's position. We also control for the logarithm of total assets and the log of firm age.[13]

Our first dependent variable is a measure of RPE compensation. We measure RPE compensation using grant level compensation data from the Incentive Lab data set. For each executive i in firm j in year t, we calculate the fraction of her performance-based compensation that is RPE as follows:

$$\frac{\text{RPE compensation}_{ijt}}{\text{Performance-based compensation}_{ijt}}$$

We define *performance-based compensation* as the sum of all compensation that is linked to a performance metric (including performance-based short-term bonus, performance-based long-term bonus, performance-based stock, performance-based options), and *RPE compensation* as the subset of performance-based compensation that is explicitly linked to peer performance metrics (either comparing to named firms or to an index). All compensation is valued at the ex-ante target compensation value,[14] that is, before the ex-post pay realization.

We create two additional measures of RPE compensation, which distinguish between RPE firms that are also members of trade associations and those that are not. Specifically, we calculate the following two ratios:

$$\frac{\text{RPE compensation (TA peers)}_{ijt}}{\text{Non-RPE Performance-based compensation}_{ijt} + \text{RPE compensation (TA peers)}_{ijt}}$$

$$\frac{\text{RPE compensation (non-TA peers)}_{ijt}}{\text{Non-RPE Performance-based compensation}_{ijt} + \text{RPE compensation (non-TA peers)}_{ijt}}$$

where *RPE compensation (TA peers)* is the sum of all compensation that is linked to a performance metric that depends on the performance of other firms that belong to at least one trade association. Analogously, *RPE compensation (non-TA peers)* is the sum of all compensation that is linked to a performance metric

[13] Firm age is listing vintage based on the first year the firm appears in the CRSP/COMPUSTAT merged database.

[14] Most performance-based awards use a three-level structure: threshold, target, and maximum. The target is the expected performance level that earns 100% of the award; the threshold is the minimum performance required to earn any payout (usually a fraction of the target); and the maximum is the exceptional performance that earns the highest payout (a value greater than the target).

that depends on the performance of firms that do not belong to any trade association.

We also analyze how trade associations influence managerial incentives beyond RPE compensation. Specifically, we examine their impact on the complete array of pay components: salary, discretionary bonus, performance-based stock awards, restricted stock awards, option awards, performance-based bonuses (non-equity incentives), other compensation, and pensions. Thus, for each executive, we compute the fraction of compensation assigned to each type of pay. Specifically, we scale the ex-ante value of each pay component by the ex-ante total value of all components. By doing so, we measure the structure of the compensation plan rather than its level (we examine levels separately).[15] Salary, discretionary bonus, and other compensation[16] are measured based on the pay received in the fiscal year. Pensions are measured as the change in the actuarial value of the pension. Option awards are valued at the grant-date using the Black and Scholes (1973) formula. Restricted stock awards are valued as the grant-date market value of all stock awards received that were not linked to a performance metric. To value performance-based equity awards and performance-based bonuses before pay realization, we use the target level (or the average of the minimum and maximum if the target is not reported) as reported in the SEC Form DEF 14A Plan-Based Awards Table, rather than the realized pay.

We propose that firms might benchmark performance against industry peers even if they do not explicitly state that they are using RPE. We thus also analyze implicit ways of generating or mitigating RPE. Specifically, following Gibbons and Murphy (1990), we measure how sensitive realized executive pay is to the performance of its peers, which is not a function of any explicit RPE metrics. For this analysis, we estimate the following regression:

$$\text{Log(Realized pay)}_{ijt} = \alpha_0 + \beta_1 \text{Firm return}_{jt} + \beta_2 \text{Peers return}_{jt} + \ \delta \ \text{Controls}_{j,t-1} + \mu_{ij} + \gamma_{spt} + \epsilon_{it} \quad (2)$$

To measure realized pay, we consider the sum of salary, discretionary bonuses, non-equity incentives payout (after performance realization), the market value of exercised options, the market value of vested stock, and the change in pensions. While not perfect, this is a good approximation of the total pay realization, as it represents all the money an executive collects in a given year. We measure focal firm returns as the fiscal year annual returns from the monthly CRSP stock return database. We define two firms as being TNIC2 peers in a given year if they are in the same TNIC2 industry (Hoberg and Phillips (2010, 2016)), and they are TA peers if both belong to the same trade association in a given year. Thus,

[15] Note that the sum of all these measures is one.

[16] Other compensation includes perquisites, signing bonuses, termination payments, and above-the-market interest paid on deferred compensation.

for peer returns, we consider four different peer groups: the average TNIC2 peers' annualized returns, the average TA peers' annualized returns, the average TNIC2 peers that are also TA peers' annualized returns (set to zero when the focal firm does not have TA peers), and the average TNIC2 peers that are not TA peers' annualized returns (set to zero if all TNIC2 peers are TA peers). In all specifications, we control for an indicator equal to one when any of these values are set to zero. As in equation (1), we include executive × firm and industry × position × year fixed effects in all regressions.

In equation (2), the coefficient β_1 captures pay-for-performance sensitivity, and β_2 captures implicit RPE. A negative β_2 indicates that executive pay decreases when peers perform well, consistent with traditional RPE. Our model predicts that β_2 should be less negative (or even positive) when the peers are TA members. This prediction reflects collaboration incentives to optimize the industry-wide opportunity, which entails the opposite sign as does competitive benchmarking. We estimate this specification separately for each peer group to test whether implicit RPE compensation differs for TA peers and non-TA peers as predicted in our model.

Table 1 and Table 2 report summary statistics and correlations for the executives and firms in our sample. The average executive receives nearly 26% of their total pay in salary, 6% in discretionary bonuses, 18% in restricted stock awards, 16% in performance-based stock, 10% in options, just over 17% in performance-based bonuses, 4% in other compensation, and 3% in pensions. These summary statistics resemble those reported for the same variables in other studies (e.g., Murphy (2013) and Edmans, Gabaix, and Jenter (2017)). 7% of the executives in our sample have explicit RPE metrics in their performance-based awards (which translates into about 4% of the average fraction of performance-based compensation in Table 1), similar to other studies using the same dataset (e.g., Bloomfield, Marvao, and Spagnolo (2023)). Among those with RPE compensation, 62% of their performance-based compensation is RPE, and 37.3% is linked to a peer who belongs to a trade association. The average sample firm belongs to 4 different trade associations, with 48% belonging to zero associations. The average firm has $21.8 billion in total assets, and is 21 years old. These characteristics are similar to those for an S&P 1500 company during the same time period.

3 Results

3.1 Trade Associations and RPE

We begin our empirical analysis by testing our model's central prediction that trade associations reduce the use of RPE both unconditionally and especially relative to peers that are also trade association members. Table 3 presents 2SLS estimates of the effect of trade association memberships on the fraction of performance-based compensation that uses RPE metrics. Panel A reports the first-stage results for both instruments. In line with the findings reported by Hoberg and Neretina (2023), both the geographic diffusion instrument (column (1)) and the board connections instrument (column (2)) strongly predict trade association memberships, with the Kleibergen-Paap Wald F-statistics for both over 100, well above conventional thresholds for instrument strength. The interpretation is that when firms are socially linked to non-industry geographic neighbors or board-connected peers that more intensively join trade associations, the focal firm itself is also likely to join. The use of non-industry peers only ensures the instruments are not influenced by unobserved industry state variables that would violate the exclusion restriction.

Panel B presents the second-stage results. Columns (1) and (4) examine overall RPE usage and show that trade associations significantly reduce RPE compensation. Using the geographic diffusion instrument, each additional trade association is associated with a 0.73 percentage point reduction in the RPE share of performance-based compensation. The board connections instrument shows a similar estimated effect of 0.58 percentage points. These effects are economically significant as they represent a 17% and 13% decline relative to the unconditional mean, respectively. For firms at the sample-wide average number of trade associations (4 TAs), this is an even larger 2.92 and 2.32 percentage-point reduction, which can account for two-thirds of the average RPE share of performance-based compensation. To investigate whether this reduction in RPE reflects our model's proposed mechanism, we decompose RPE compensation by peer type. Columns (2) and (5) examine RPE metrics based on TA peers, while Columns (3) and (6) focus on non-TA peers. In line with our predictions, we find that trade associations significantly reduce RPE relative to TA peers but we find no significant effects on RPE relative to non-TA peers.

Overall, these results are consistent with our model's prediction that firms use compensation contracts to incentivize collaboration with trade association peers that can optimize the value of the important industry-wide opportunities provided by the associations. By reducing competitive benchmarking against fellow TA members while maintaining RPE against non-members who do not contribute to the collaborative opportunity, firms can more fully internalize the positive externalities from collaborative efforts.

We extend this analysis to examine the effect of the associations on compensation peer selection. A broad literature shows that a key element of executive compensation design is the strategic selection of compensation benchmark peers (Bizjak, Lemmon, and Naveen (2008); Faulkender and Yang (2010); Bizjak, Lemmon, and Nguyen (2011); Albuquerque, De Franco, and Verdi (2013); Denis, Jochem, and

Rajamani (2020)). Peer group composition can shape the choice of compensation components and total value. It also provides a stable market-based justification for such compensation decisions. We thus examine whether trade associations impact this important choice of which firms are compensation peers.

Table 4 examines two dimensions of peer selection using pairwise analysis that includes all pairs of firms in our sample. The two dimensions are (1) peers chosen as the benchmarks specifically to implement RPE, and (2) peers chosen as compensation peers to calibrate pay levels and components. We examine the effects of TAs on the selection of these RPE peers and compensation benchmark peers. Our main independent variable is an indicator that equals one if the two firms are members of the same trade association in a given year, and is zero otherwise. We create a pairwise version of our instruments by computing the product of the corresponding instruments for the two firms in each pair.[17] The specification includes firm-pair fixed effects, which control for all time-invariant characteristics of each pair, and year fixed effects.[18] The first two columns show the first-stage estimation for the two instruments, and we find strong results with F-statistics well-exceeding required levels for both instruments. In the second stage, we use two dependent variables. In columns (3) and (4), the dependent variable is an indicator variable that equals one if at least one of the firms in the pair is chosen as an RPE peer for the other firm in a given year. In columns (5) and (6), the indicator equals one if at least one of the firms is a compensation peer for the other firm in a given year.

We find that firms sharing the same trade association are 3.4-4.5% less likely to use each other as RPE peers, as shown in columns (3) and (4). These effects are economically material and provide direct evidence that firms strategically avoid competitive RPE benchmarking against trade association peers. Given that the baseline probability of RPE peer selection among industry peers is relatively low, these percentage point reductions represent meaningful shifts in peer selection behavior. Columns (5) and (6) show the opposite effect when analyzing compensation benchmark peers. TA members are 4.9-7.1% *more* likely to use each other as general compensation peers. By becoming benchmark compensation peers, TA firms can facilitate coordination in compensation practices while justifying such collaborative practices for external observers.

In columns (7) and (8), we go one step further and examine the choice of compensation consultants. Thus, the dependent variable is an indicator for whether the two firms use the same compensation consultant in a given year. We find that two firms are 65-71% more likely to use the same compensation consultant after they join the same trade association. This result suggests that common consultants can

[17] Hoberg and Neretina (2023) use the same approach in the pairwise version of the instruments.

[18] For this analysis, we restrict the sample period to after 2006 due to data availability. The disclosure of benchmark peers became mandatory with the SEC compensation disclosure rules of 2006.

help to coordinate compensation structures across TA firms, and using the same consultant can be a commitment device. This helps to ensure that collaboration-inspired pay is consistently implemented across TA peers throughout each industry.

While Table 3 shows that firms explicitly reduce RPE relative to trade association peers, our intellectual framework predicts additional deeper shifts in incentives. We expect firms will not only reduce competitive RPE benchmarking, but also find additional ways to reward executives when TA peers succeed. This is likely necessary due to the fact that many investors and proxy advisors see industry incentives in pay contracts as non-standard and controversial as discussed earlier. Thus implicit provision of these incentives might be more optimal for the firm given these tradeoffs than direct (easily observed) contractual incentives.

To test for potential implicit incentives, we estimate equation (2) and examine how realized executive compensation responds to both own-firm and peers' performance. Under RPE, we would expect strong negative influences from peer performance. In contrast, when optimizing collaborative opportunities under TAs, this coefficient should become more positive. Table 5 presents the results. Column (1) first shows evidence of unconditional RPE effects when we do not consider trade associations. Although own-firm returns have a strong positive effect on realized pay (the standard pay-for-performance relationship), peer returns have a negative effect coefficient. Thus, at least unconditionally, executives receive less pay when their industry peers perform well. This result replicates Gibbons and Murphy (1990) and Murphy (1999) analyses of implicit RPE.

Interestingly, column (2) shows a reversal of this pattern for trade association peers, as executives receive higher pay when their trade association peers perform well. This is in line with the collaboration incentives predicted by our model: firms reward executives when fellow TA members succeed, thus internalizing the positive externalities from collaborative investments in industry-wide opportunities. Column (3) presents the most compelling result as we further decompose industry peer returns into those of peers who are also TA members and those who are not. The results are quite stark and confirm that the collaboration incentives operates specifically through TA relationships. The coefficient on TA industry peers is positive, and the coefficient on non-TA industry peers remains negative. This differential effect mirrors the explicit RPE results in Table 3, and shows that explicit analysis potentially understates the true magnitude of collaboration incentives on executive pay. These results also reinforce our interpretation that firms are reticent to openly provide strong contractual incentives directly linked positively to industry peer performance given its controversial nature. To circumvent these issues, firms likely implicitly adjust elements of pay to further promote collaboration with TA members. Moreover, they maintain competitive benchmarking against non-TA members as these peers do not contribute or benefit from the collaborative good the focal firms are attempting to incentivize.

These ex-post realized pay results are particularly revealing because they can operate through compensation components that are not explicitly linked to performance metrics. Therefore, this approach captures the total effect on incentives, including channels that may be difficult to specify explicitly in contracts. Implicit adjustments can flexibly reward collaborative activities that are difficult to measure or contract upon directly, which are the type of investments in industry-wide opportunities that our model emphasizes. Importantly, these mechanisms do not require explicitly/contractually linking compensation to peer performance metrics, which might draw objections from shareholders and attract activists. To further document the specific mechanisms that drive these results, in the next section, we examine how firms implement these incentives through their overall compensation structure.

3.2 Implementation of Collaborative Incentives

We now consider finer-grained analysis of pay components to begin our assessment of mechanisms driving our above results. Specifically, we start with actual contracts and examine the individual pay components that make up observable contracts. Table 6 presents 2SLS estimates of the effect of trade associations on pay structure, measured as the fraction of total compensation allocated to each of the eight primary pay components. Panel A uses the geographic diffusion instrument, while Panel B uses the board connections instrument. Both instruments continue to show strong first-stage performance, with F-statistics well above conventional thresholds.

The results show a reallocation of compensation away from fixed pay and explicit performance-based pay toward more flexible incentive components. On fixed pay, trade association influence leads to significantly less compensation as salary, other compensation, and pensions. These reductions are consistent with our model's prediction that firms increase overall incentive intensity as trade associations require motivating both firm value effort and industry-wide effort ($\beta^* + |\gamma^*_{TA}| > \beta^*_{baseline}$). Thus our model predicts more incentive pay overall and less fixed pay. Yet perhaps more importantly, we also find that trade associations shift the composition of incentive pay toward components that can serve as more flexible bonuses that might specifically and implicitly target effort on industry collaboration moreso than firm-specific effort. Regarding incentives, the share of compensation allocated to discretionary bonuses, restricted stock, and options increases significantly. Simultaneously, the share allocated to performance-based stock awards and performance-based bonuses decreases.

This pattern supports our predictions given the nature of collaboration incentives and the institutional details discussed earlier. Performance-based stock awards and performance-based bonuses require explicit performance metrics that are publicly specified ex-ante in compensation contracts. It would be difficult for a firm to explicitly tie compensation to the performance of an entire industry or to collaborative activities of TA peers. Such direct contractual metrics might raise concerns among shareholders about whether executives are being rewarded for competitors' success, or they might raise concerns about potential antitrust intervention. In contrast, options, restricted stock, and discretionary bonuses provide flexibility to reward collaboration without explicit metrics. Discretionary bonuses are particularly well-suited for implementing collaboration bonuses, as they provide boards with the flexibility to reward executives for collaborative activities that are difficult to specify in formal performance metrics. Options and restricted stock are tied to the firm's long-term stock price and do not incorporate RPE adjustments. They thus capture some benefits to industry collaboration, and therefore, reward collaborative efforts. These findings connect directly to our implicit RPE findings in Table 5: boards can exercise discretion to increase pay when TA peers succeed, thus implementing a collaboration-success bonus ($\gamma^*_{TA} < 0$) through these pay components that do not incorporate RPE and do not require explicit contractual line-items to indicate collaboration pay.

Together, the results in Table 6 complement and extend our earlier findings. Trade associations induce a systematic shift in how firms design executive pay. This shift operates through three channels: (1) increasing long-term equity compensation (options and restricted stock) that automatically captures the value of collaborative investments, (2) increasing discretionary bonuses that allow boards to more directly reward observable but hard-to-contract collaborative activities, and (3) decreasing explicit performance-based pay that would require formally specifying metrics for collaboration.

We complement these results with an analysis of the level and dynamics of total compensation. Panel A in Table 7 shows that trade associations also result in increased total ex-ante compensation. This result is consistent with our model and the consequences of risk aversion when high incentives are needed: since executives are risk-averse and our earlier results show that trade associations increase total performance-based pay, firms must compensate executives more in total for bearing additional risk. More relevant, Panel B examines how changes in total compensation respond to peer performance. We regress the growth in total ex-ante pay from year t to year $t + 1$ (change in the size of the overall compensation package) on the interaction between trade association membership and peer returns in year t. The results show different effects depending on whether the industry peers are also TA members or not. When TA industry peers perform well, firms increase the manager's next-year compensation. In contrast, when non-TA peers perform well, firms decrease next year's compensation. These results suggest that firms reward executives for successful collaboration simply by paying them more next year. This is another indication of implicit incentives to provide higher effort levels to maximize the success of the collaborative opportunities the TA provides. Indeed, these increases are not contracted but boards nevertheless provide these pay increases when managers perform well on collaborative goals. In columns 3-4, we use the average growth in total ex-ante pay over the next two years, and in columns 5-6, we do the same over the next three years. We find significant effects, suggesting that firms smooth rewards for successful collaboration over 1-3 years, likely to further induce stability and longer-term thinking, and to reduce any scrutiny that larger and more sudden increases would attract.

3.3 Life Cycle Tradeoffs Favoring Stronger Collaboration

Not all firms benefit equally from collaborative investments, and the incentives to collaborate should be stronger when the benefits are larger. For example, the value of collaborative opportunities should be higher when the conditions are stable, and when products are established, as that ensures the realization of longer-term benefits from collective action are not disrupted. This prediction is reinforced by the fact that collaboration entails relationship-building, which can be a more gradual process. We start by considering firm life cycle stages based on Abernathy and Utterback (1978) developed by Hoberg and Maksimovic (2022).[19] Many trade association benefits are most relevant for process optimization-stage and more mature-stage firms (e.g., technology diffusion, process certifications, brand enhancement, lobbying efforts, and data sharing). Early or late stage firms might benefit less as these gains might be short lived as product portfolios rapidly turn over. Therefore, we expect collaboration to be especially valuable for firms in the process-optimization (Life 2) and the mature (Life 3) stage.

Table 8 presents 2SLS estimates where we interact predicted trade association memberships with indicators for the firm life cycle stage. The dependent variable in all columns is RPE compensation based on trade association peers as a fraction of performance-based compensation. Columns (1)–(3) use the geographic diffusion instrument, while Columns (4)–(6) use the board connections instrument. Columns (1) and (4) combine Life 2 and Life 3 given our above motivation, and we observe the strongest results. Overall, this indicates that the negative effect on TAs on RPE is significantly larger for process-optimizing and mature firms. For both instruments, the interaction coefficient suggests that the total effect for these firms is nearly double the baseline effect. Columns (2)–(3) and (5)–(6) examine the effect of each life stage separately. We find similar and significant effects for Life 2 using the board connections

[19] Hoberg and Maksimovic (2022) classify firms into life cycle stages based on textual analysis of product descriptions in 10-K filings. Life 1 represents product development and product innovation, Life 2 represents process optimization, Life 3 represents mature firms with stable product portfolios, and Life 4 represents product decline.

instrument, and for Life 3 using the geographic diffusion instrument. Overall, the results support our prediction that collaboration incentives should increase when the value of collaboration benefits is likely to be larger.

3.4 Industry Governance Stability

For incentive mechanisms to effectively promote and nurture collaboration, the stability of governance structures is important. This ensures that long-term relationships can be built up and optimized without risk of lost incentives. Frequent turnover in management or boards could undermine the credibility of implicit agreements and discretionary bonuses that reward collaborative activities that can be longer-term in nature and that depend on implicit (non-contractual) compensation promises as noted above. Moreover, short-term pressures from hostile takeovers or activist shareholders could force firms to prioritize individual performance over collective benefits. In this section, we examine several mechanisms through which trade associations foster governance stability that likely enhance collaboration and relationship-oriented value.

Using the same specification of equation (1), Table 9 presents 2SLS estimates regarding how trade associations affect four dimensions of governance that facilitate sustained collaboration. Columns (1) and (2) show that trade associations increase average vesting periods by 11.3-12.7 months, a significant increase given that typical vesting periods range from 36 to 48 months. Longer vesting periods align executive horizons with the long-term nature of industry collaboration, and also reduce executive incentives to pursue short-term competitive strategies at the expense of long-term collective benefits. These results fit well with our thesis and illustrate depth regarding mechanisms for pay package design.

Columns (3) and (4) examine the adoption of classified (staggered) boards, where only a fraction of directors stand for election each year. This practice makes it more difficult for hostile acquirers or activist investors to gain rapid control of the board, providing protection for long-term collaboration. We find that trade associations increase the probability of having a classified board by 5.2-5.9 percentage points. Columns (5) and (6) provide reinforcing complementary evidence as they directly examine hostile takeover activity. The dependent variable is an indicator for whether the firm is the target or acquirer in a hostile acquisition attempt in a given year. In line with trade association members facing less market pressure for corporate control, we find that trade associations indeed significantly reduce the probability of hostile takeovers.

We also examine director network density within industries. We thus measure the extent to which firms in the same industry share common directors. The rationale for this test is that denser director networks facilitate information sharing and monitoring of collaborative efforts. These network connections also facilitate the diffusion of governance practices and compensation norms throughout the industry. The dependent variable in our test is the industry-level (TNIC2 industries-based) overlapping-director network density proposed by Cabezon and Hoberg (2025), and the key independent variable is the TNIC2 trade association network density (computed using the same methodology). We estimated a 2SLS analysis in which the instrument for TNIC2 TA network density is the average value of the corresponding individual instruments across all TNIC2 peers. Columns (7) and (8) display the second-stage results of this analysis and show that trade associations significantly increase within-industry director network density.

Overall, the results in this section show that trade associations do not induce firms to simply change compensation contract line-items in isolation and with full transparency. Rather, the results illustrate a comprehensive and much more nuanced (and harder to observe) set of governance structures that enhance the value of collaboration. TA firms strategically adjust incentives based on the value of collaboration, coordinate their compensation practices through benchmarking peers and compensation consultants (as previously reported in Table 4), and adopt governance structures that support long-term collaborative relationships (i.e., longer vesting periods, classified boards, reduced hostile takeover activity, and denser director networks).

3.5 Do Industry-Level Incentives Work?

If trade associations promote industry collaboration through pay incentives, we should observe superior industry performance when these incentives become stronger. To test this hypothesis rigorously, we need a shock that changes executive incentives for reasons exogenous to industry performance and trade association memberships. We thus exploit the Tax Cuts and Jobs Act (TCJA) of 2017, which eliminated the tax deductibility of performance-based executive compensation and thereby increased the after-tax cost to firms of providing such incentives.

3.5.1 Institutional Details

Section 162(m) of the U.S. tax code, enacted as part of the Omnibus Budget Reconciliation Act of 1993, limited corporate tax deductions for executive compensation exceeding $1 million. However, this provision included an important exception: performance-based compensation remained fully deductible even above the $1 million threshold. This exception created a tax incentive for firms to structure executive pay as performance-based (stock options, performance-based stock, and performance-based bonuses) rather than fixed (salary, discretionary bonuses, time-vesting restricted stock).

The Tax Cuts and Jobs Act, signed into law on December 22, 2017, eliminated this exception. This change became effective for the 2018 tax year. Under the new rules, *all* compensation above \$1 million became non-deductible, regardless of whether it was performance-based or fixed. This plausibly exogenous shock removed the tax advantage of performance-based pay and increased the effective cost for firms providing performance incentives to executives (Murphy et al. (2018)). We, therefore, use the reform as a shock to performance-based compensation.

3.5.2 Empirical Design

We run a difference-in-differences estimation that exploits variation in exposure to the TCJA shock at the executive level. Following Murphy et al. (2018), we measure each executive's treatment intensity based on their 2016 compensation structure (the year before the TCJA was enacted). Specifically, treatment captures the change in the firm's after-tax cost of compensation resulting from the elimination of the performance-based pay exemption:

$$\text{Treatment}_{ij} = \frac{(\text{Tax cost under TCJA rules})_{ij,2016} - (\text{Tax cost under pre-TCJA rules})_{ij,2016}}{(\text{Tax cost under pre-TCJA rules})_{ij,2016}}$$

The numerator represents the increase in non-deductible compensation (and thus the increase in after-tax cost to the firm) due to the TJCA.[20] Critical for our empirical strategy, the magnitude of the shock varied across executives based on their pre-existing compensation structures: executives with a compensation structure that relied heavily on performance-based pay above the \$1 million threshold faced larger increases in compensation costs. This cross-sectional variation provides identifying power for our analysis.

We estimate treatment effects using a 2SLS model. In the first stage, we estimate a difference-in-differences regression using the fraction of total compensation that was affected by the shock as the dependent variable (i.e., performance-based stock, options, and performance-based bonuses). Specifically, in our first stage, we estimate the following regression:

$$\text{TJCApay}_{ijt} = \alpha_0 + \alpha_1(\text{Treatment}_{ij} \times \text{Post2017}_t) + \gamma_{ij} + \delta_{jt} + \theta_{spt} + \varepsilon_{ijt} \tag{3}$$

[20] We measure $Taxcost_{ijt}$ as: Total pay_{ijt} − (Marginal tax rate_{jt}) × (Total pay_{ijt} − Non-deductible pay_{ijt}). Under the pre-TCJA rules, non-deductible compensation included salary, discretionary bonuses, and time-vesting restricted stock above \$1 million. Under the TCJA rules, all compensation above \$1 million became non-deductible, including performance bonuses, option exercises, and all equity vesting. See Murphy et al. (2018) for more details. We obtain marginal tax rates from Graham (1996a) and Graham (1996b).

where $\text{TJCApay}_{ijt} = \frac{\text{Performance stock + Options + Performance bonuses}}{\text{Total compensation}}$ measures the fraction of compensation that is affected by the reform.

In the second stage, we regress our main dependent variables on the predicted value of TJCApay_{ijt} from the first stage. We interact the predicted TJCApay with the trade association memberships of each firm in 2016 (one year before the reform).

$$\text{Performance}_{ijt} = \beta_0 + \beta_1(\widehat{\text{TJCApay}}_{ijt} \times \text{TAmemberships}_{j,2016}) + \beta_2\widehat{\text{TJCApay}}_{ijt} + \gamma_{ij} + \theta_{pt} + \varepsilon_{ijt} \quad (4)$$

The coefficient β_1 captures whether reductions in performance-based pay have different effects for firms with more versus fewer ex-ante trade association ties.

In both stages, we restrict the sample period to 2014–2020, excluding 2017 (3 years before and 3 years after the shock). In the first stage, we include executive × firm, firm × year, and position × industry × year fixed effects. The firm × year fixed effects are particularly important for identifying the effect in the first-stage. They control for all time-varying firm characteristics, including any other impact of the tax reform at the firm level. Our identification therefore comes from comparing executives within the same firm in the same year who faced different treatment intensities based on their pre-TJCA compensation structures. Since our performance measures are calculated at the firm level, in the second stage, we use executive × firm and position × year fixed effects.

3.5.3 Results

Table 10 displays the results, and Panel A shows a negative and significant effect on performance-based compensation in the first stage. The Kleibergen-Paap Wald F-statistic is 14, above the requirement for acceptable instrument strength of 10, suggesting that the instrument is reasonably strong. To test the parallel trends assumption, key to validating the first stage, we examine the effect of treatment on performance-based compensation before and after the shock. Specifically, we estimate the following regression:

$$\begin{aligned}\text{TJCApay}_{ijt} = {} & \beta_{2014}(\text{Treatment}_{ij}) \times (\text{Year}_{2014}) + \beta_{2015}(\text{Treatment}_{ij}) \times (\text{Year}_{2015}) \\ & + \beta_{2016}(\text{Treatment}_{ij}) \times (\text{Year}_{2016}) + \beta_{2018}(\text{Treatment}_{ij}) \times (\text{Year}_{2018}) \\ & + \beta_{2019}(\text{Treatment}_{ij}) \times (\text{Year}_{2019}) + \beta_{2020}(\text{Treatment}_{ij}) \times (\text{Year}_{2020}) \\ & + \gamma_{ij} + \delta_{jt} + \theta_{spt} + \varepsilon_{ijt}\end{aligned} \quad (5)$$

As above, we restrict the sample period to 2014–2020 (three years before and three years after the shock), include executive × firm, firm × year, and position × industry × year fixed effects. The coefficients of interest are β_t. We expect a drop in these coefficients after 2017. Figure 1 plots these coefficients and shows supportive graphical evidence for the assumption of parallel trends.

In the second stage, we examine four performance measures: sales growth, return on equity (ROE), R&D, and advertising expenditures. We define sales growth as log(Sales/Lagged Sales), ROE as Operating income before depreciation divided by equity (assets - long-term debt - current debt), R&D as R&D expenditures divided by lagged assets, and advertising as advertising expenditures divided by lagged assets. For each variable, we construct both industry-level and firm-level outcomes. Industry-level performance is the average value across TNIC2 peers (excluding the focal firm), whereas firm-level performance is the focal firm's performance minus the industry average. This decomposition allows us to separately identify effects on collective industry outcomes versus individual firm competitive positioning.

Panels B and C present second-stage results for industry-level and firm-level performance, respectively. The key coefficient is the interaction between predicted TJCApay and the number of trade association memberships in 2016. We find that an increase in performance-based pay improves industry-wide outcomes, but only for firms with strong trade association ties. We observe an increase in industry average sales growth, ROE, R&D investment, and advertising. The positive effects on R&D and advertising are particularly important, as these represent activities that generate positive spillovers throughout the industry and that are especially facilitated by trade associations. Notably, the unconditional effect of TJCApay (without the interaction) is generally insignificant or negative, indicating that reducing performance-based pay does not improve industry outcomes for firms without trade association ties. This is consistent with the collaboration mechanism operating specifically through the trade association channel.

Importantly, when analyzing the firm-level results, the main effect of TJCApay is positive and significant, and the interaction term is negative in all regressions. These results suggest that for firms without trade association ties, performance incentives increase competitive intensity but not collaboration.

Overall, the TJCA analysis provides compelling evidence that the compensation mechanisms we document have the predicted real effects on industry outcomes. Exogenously giving managers more incentive pay results in better industry performance when trade associations are present, but results in better firm performance when they are not. These results are core to our proposed intellectual framework.

4 Conclusion

We propose a hypothesis new to the literature suggesting that some firms structure their governance mechanisms to target industry-level performance rather than firm-specific performance, and that trade associations play a role in coordinating this shared governance model. Our simple theoretical model predicts significant deviations in executive pay and governance practices from the standard RPE contract that arises from firm-specific optimization. A consequence is that the shared governance model offers a new explanation for the longstanding puzzle regarding the observation that RPE contracts are not prevalent in practice. The most refined version of the model predicts that RPE contracts can still be optimal under shared governance, but they would need to target industry peers that are not members of trade associations as the benchmarks. Industry peers who are members of trade associations simply should not be benchmark RPE peers under the optimal contract.

We find strong support for the existence of the shared industry governance model as well as its predicted connection to trade associations. Firms exposed to plausibly exogenous variation in trade associations use less RPE, and moreover, this result is particularly significant for RPE that would benchmark trade association members as peers. These pay-allocation results are reinforced by direct evidence using actual benchmark peer data showing that TA peers indeed are not selected as frequently in RPE contracts. Moreover, TA peers are instead chosen more often as peers for selecting pay package design (illustrating predicted collaboration in designing pay among members) even as they are less likely to be selected specifically as RPE benchmarks. These results are direct predictions of our model and illustrate that the proliferation of the shared governance model can explain part of the puzzle regarding the low prevalence of RPE in practice.

We further document that the shared industry governance model is more likely to be used when its benefits are likely to be larger, and that its impact on governance extends beyond pay incentives alone. We note four important contributions on these dimensions. First, industry incentives are controversial given regulatory debates and shareholder preferences for RPE, and hence we find that the mechanisms that provide industry incentives are largely implicit. These practices thus lack transparency. Second, the mechanism favors shifting pay to components that offer boards discretion in determining pay such as discretionary bonuses, and components that generally load less on RPE than others. For example, such packages favor stock options over performance-based stock awards. Third, the shared governance model is more prevalent for firms engaged in process optimization and the mature stages of the product life cycle. Benefits are likely largest for these firms given the trade association focus on efficiency, and the importance of stable markets in realizing the long-term benefits of collaboration.

Finally, we use a quasi-natural experiment where tax deductibility of incentive pay was eliminated in 2017, and find that the resulting reductions in incentives indeed result in reduced industry-level performance for firms that are ex-ante exposed to trade associations. We find analogous reduced firm-specific performance for those that are not exposed. These findings broadly match the refined predictions of our simple theory of shared industry governance. Our empirical framework also opens the door to future research aimed at further exploring the nature of shared industry governance and related regulatory issues such as transparency and incentives to collude, and also the nature of shareholder activism in the face of less transparent and heterogeneous pay practices.

References

Abernathy, W. J., and J. M. Utterback. 1978. Patterns of industrial innovation. *Technology Review* 80:40–7.

Aggarwal, R. K., and A. A. Samwick. 1999. The other side of the trade-off: The impact of risk on executive compensation. *Journal of Political Economy* 107:65–105.

Albuquerque, A. 2009. Peer firms in relative performance evaluation. *Journal of Accounting and Economics* 48:69–89.

Albuquerque, A. M., G. De Franco, and R. S. Verdi. 2013. Peer choice in CEO compensation. *Journal of Financial Economics* 108:160–81.

Antle, R., and A. Smith. 1986. An empirical investigation of the relative performance evaluation of corporate executives. *Journal of Accounting Research* 1–39.

Antón, M., F. Ederer, M. Giné, and M. Schmalz. 2023. Common ownership, competition, and top management incentives. *Journal of Political Economy* 131:1294–355.

Bertrand, M., and S. Mullainathan. 2001. Are CEOs rewarded for luck? The ones without principals are. *Quarterly Journal of Economics* 116:901–32.

Bizjak, J., M. Lemmon, and T. Nguyen. 2011. Are all ceos above average? An empirical analysis of compensation peer groups and pay design. *Journal of Financial Economics* 100:538–55.

Bizjak, J. M., M. L. Lemmon, and L. Naveen. 2008. Does the use of peer groups contribute to higher pay and less efficient compensation? *Journal of Financial Economics* 90:152–68.

Black, F., and M. Scholes. 1973. The pricing of options and corporate liabilities. *Journal of Political Economy* 81:637–54.

Bloomfield, M. J., H. L. Friedman, and H. Y. Kim. 2024. Common ownership, executive compensation, and product market competition. *The Accounting Review* 99:31–56.

Bloomfield, M. J., M. S. Heinle, and O. Timmermans. 2024. Relative performance evaluation and strategic peer-harming disclosures. *Journal of Accounting Research* 62:877–933.

Bloomfield, M. J., C. Marvao, and G. Spagnolo. 2023. Relative performance evaluation, sabotage and collusion. *Journal of Accounting and Economics* 76:101608–.

Cabezon, F., and G. Hoberg. 2025. Leaky director networks and innovation herding. *Review of Financial Studies* .

Denis, D. K., T. Jochem, and A. Rajamani. 2020. Shareholder governance and CEO compensation: The peer effects of say on pay. *Review of Financial Studies* 33:3130–73.

Dicks, D. L., and P. Fulghieri. 2025. Uncertainty, contracting, and beliefs in organizations. *Review of Financial Studies* 38:2182–225.

Edmans, A., X. Gabaix, and D. Jenter. 2017. Executive compensation: A survey of theory and evidence 1:383–539.

Faulkender, M., and J. Yang. 2010. Inside the black box: The role and composition of compensation peer groups. *Journal of Financial Economics* 96:257–70.

Galambos, L. 1966. *Competition and cooperation: The emergence of a national trade association*. Baltimore, Maryland: The Johns Hopkins Press.

Garvey, G., and T. Milbourn. 2003. Incentive compensation when executives can hedge the market: Evidence of relative performance evaluation in the cross section. *Journal of Finance* 58:1557–82.

Gibbons, R., and K. J. Murphy. 1990. Relative performance evaluation for chief executive officers. *ILR Review* 43:30–S.

Gong, G., L. Y. Li, and J. Y. Shin. 2011. Relative performance evaluation and related peer groups in executive compensation contracts. *The Accounting Review* 86:1007–43.

Gopalan, R., T. Milbourn, and F. Song. 2010. Strategic flexibility and the optimality of pay for sector performance. *Review of Financial Studies* 23:2060–98.

Graham, J. R. 1996a. Debt and the marginal tax rate. *Journal of Financial Economics* 41:41–73.

———. 1996b. Proxies for the corporate marginal tax rate. *Journal of Financial Economics* 42:187–221.

Guernsey, S., F. Guo, T. Liu, and M. Serfling. 2023. Thirty years of change: The evolution of classified boards. *Journal of Finance* .

Ha, S., F. Ma, and A. Žaldokas. 2024. Motivating collusion. *Journal of Financial Economics* 154:103798–.

He, L., T. M. Whited, and R. Guo. 2025. Relative performance evaluation and strategic competition. *Review of Financial Studies* hhaf028.

Hoberg, G., and V. Maksimovic. 2022. Product life cycles in corporate finance. *Review of Financial Studies* 35:4249–99.

Hoberg, G., and E. Neretina. 2023. Do trade associations matter to corporate strategies? *Available at SSRN 4575314* .

Hoberg, G., and G. Phillips. 2010. Product market synergies and competition in mergers and acquisitions: A text-based analysis. *Review of Financial Studies* 23:3773–811.

———. 2016. Text-based network industries and endogenous product differentiation. *Journal of Political Economy* 124:1423–65.

Holmstrom, B. 1982. Moral hazard in teams. *Bell Journal of Economics* 324–40.

Holmstrom, B., and P. Milgrom. 1987. Aggregation and linearity in the provision of intertemporal incentives. *Econometrica: Journal of the Econometric Society* 303–28.

Janakiraman, S. N., R. A. Lambert, and D. F. Larcker. 1992. An empirical investigation of the relative performance evaluation hypothesis. *Journal of Accounting research* 30:53–69.

Jayaraman, S., T. Milbourn, F. Peters, and H. Seo. 2021. Product market peers and relative performance evaluation. *The Accounting Review* 96:341–66.

Jensen, M. C., and K. J. Murphy. 1990. Performance pay and top-management incentives. *Journal of Political Economy* 98:225–64.

Martin, M., and O. Timmermans. 2025. Disclosure costs of relative performance evaluation. *Management Science* .

Murphy, K. J. 1999. Executive compensation. In *Handbook of Labor Economics*, vol. 3B, 2485–563. Amsterdam: North-Holland.

———. 2013. Executive compensation: Where we are, and how we got there. In *Handbook of the Economics of Finance*, vol. 2, 211–356. Elsevier.

Murphy, K. J., et al. 2018. The politics of pay: The unintended consequences of regulating executive compensation. *The Politics of Pay: The Unintended Consequences of Regulating Executive Compensation (April 18, 2018). USC Law Legal Studies Paper* .

Nurisso, G. 2025. The consequences of index investing on managerial incentives. *Available at SSRN 5258647* .

Schäfer, P. 2023. Relative performance evaluation and strategic differentiation. *The Accounting Review* 98:419–53.

Varroney, D. A. 2022. *Reimagining industry growth: Strategic partnership strategies in an era of uncertainty*. Wiley.

Warford, L. E., R. A. May, and J. Klein. 1923. *Trade association activities*. US Government Printing Office.

Figure 1: TJCA shock: Parallel trends

The figure illustrates parallel trends analysis around the TJCA tax reform of 2017. Each dot reports the estimated β_t coefficients of equation (5). The estimation includes executive $\times$ firm, firm $\times$ year, and position $\times$ industry $\times$ year fixed effects, and cluster standard errors by executive. The vertical lines reports the 95% confidence interval.

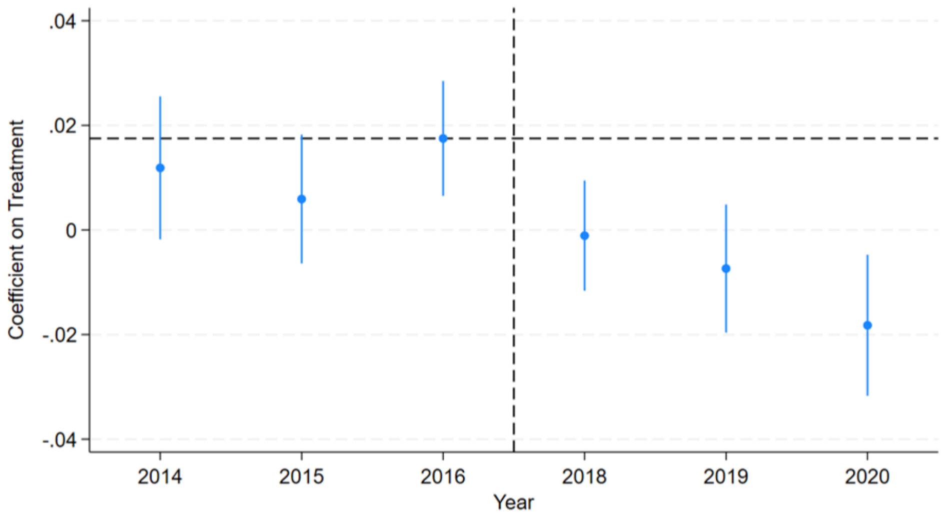

Table 1: Summary statistics

This table presents the summary statistics of the main variables. The sample consists of 150,744 executive-firm-year observations from 1999 to 2023. RPEcomp/perf-based comp is the fraction of performance-based compensation tied to RPE. RPEcomp (TA)/perf-based comp and RPEcomp (nonTA)/perf-based comp decompose RPE by whether benchmark peers are trade association members. Associations is the number of trade association memberships from Hoberg and Neretina (2023). Assets is total assets in millions of dollars and firm age since first appearance in CRSP/Compustat is computed using the first effective date of the current link. Compensation components are measured as described in section 2. Annual returns are computed as the fiscal year annual returns from the monthly CRSP stock return database. All non-binary variables are yearly winsorized at the 1%–99% level.

Variable	Obs	Mean	Std. Dev.	Min	Max	P50
RPEcomp / perf-based comp	150744	4.385	17.692	0	100	0
RPEcomp (TA) / perf-based comp	150744	2.299	12.937	0	93.333	0
RPEcomp (non-TA) / perf-based comp	150744	3.014	13.302	0	89.906	0
Number of trade associations	150744	4.165	9.683	0	106	1
Total assets	150717	21842.55	116649.3	6.599	3743567	3305.778
Firm age	150722	21.387	16.014	-1	60	18
Perf stock / total	150744	.16	.177	0	.76	.119
Rest stock / total	150744	.177	.189	0	.932	.14
Options / total	150744	.103	.165	0	.891	0
Perf bonus / total	150744	.172	.129	0	.714	.167
Disc bonus / total	150744	.058	.128	0	.864	0
Salary / total	150744	.255	.158	0	1	.225
Other comp / total	150744	.042	.08	0	.665	.017
Pension / total	150744	.025	.072	0	.488	0
Annual return	150726	.34	.443	-.455	5.109	.235
Avg annual return TN2 peers	107716	.362	.374	-.335	16.299	.304
Avg annual return TA peers	78317	.325	.237	-.312	7.287	.294
Avg annual return TA TN2 peersl	107716	.159	.306	-.459	12.118	0
Avg annual return non-TA TN2 peers	107716	.366	.391	-.335	16.299	.306

Table 2: Correlations

This table displays the Pearson correlation matrix of the main variables. The sample consists of 150,744 executive-firm-year observations from 1999 to 2023. RPEcomp/perf-based comp is the fraction of performance-based compensation tied to RPE. RPEcomp (TA)/perf-based comp and RPEcomp (nonTA)/perf-based comp decompose RPE by whether benchmark peers are trade association members. Associations is the number of trade association memberships from Hoberg and Neretina (2023). Assets is total assets in millions of dollars and firm age since first appearance in CRSP/Compustat is computed using the first effective date of the current link. Age is the number of years since the initial Compustat listing. All non-binary variables are yearly winsorized at the 1%–99% level.

	RPE/perfpay	RPE(TA)/perfpay	RPE(nonTA)/perfpay	Associations	Assets	Age
RPE/perfpay	1.000					
RPE(TA)/perfpay	0.865	1.000				
RPE(nonTA)/perfpay	0.929	0.720	1.000			
Trade associations	0.047	0.037	0.015	1.000		
Assets	0.064	0.071	0.065	0.171	1.000	
Age	0.099	0.077	0.087	0.211	0.117	1.000

Table 3: Trade associations and RPE compensation

This table presents 2SLS estimates of the effect of trade association membership on RPE compensation. Panel A reports first-stage results for both instruments. The Geographic diffusion instrument (columns (1)–(3)) uses trade association membership spillovers from geographically proximate, similarly-sized firms in different industries. The Board connections instrument (columns (4)–(6)) uses spillovers from firms connected through overlapping boards, employment, education, or social clubs, excluding same-industry firms. Panel B reports second-stage results. Column (1) and (4) examine overall RPE usage (fraction of performance-based pay tied to RPE metrics). Columns (2) and (5) examine RPE against trade association member peers only. Columns (3) and (6) examine RPE against non-trade-association peers only. All specifications include executive × firm and industry × position × year fixed effects (industry: SIC-4; position: CEO, CFO, director, other). Standard errors are clustered by executive. $^{*}p<.1$; $^{**}p<.05$; $^{***}p<.01$.

Panel A: First stage

	(1) # memberships	(2)
lag GEO instrument	0.248***	
	(11.130)	
lag OD instrument		0.370***
		(14.715)
log of firm age in t-1	0.398***	0.447***
	(5.520)	(6.073)
log of total assets in t-1	0.499***	0.317***
	(6.811)	(4.263)
Observations	137,023	134,687
R-squared	0.962	0.963
Executive × Firm FE	YES	YES
Industry × Position × Year FE	YES	YES

Panel B: Second stage

	GEO instrument			OD instrument		
	(1) RPE comp /perf-based comp	(2) RPE comp (TA peers) /perf-based comp	(3) RPE comp (non-TA peers) /perf-based comp	(4) RPE comp /perf-based comp	(5) RPE comp (TA peers) /perf-based comp	(6) RPE comp (non-TA peers) /perf-based comp
# associations (pred) in t-1	-0.730***	-0.597***	-0.306*	-0.578***	-0.503***	-0.217
	(-3.045)	(-3.209)	(-1.713)	(-3.114)	(-3.457)	(-1.576)
log of firm age in t-1	0.348	0.050	0.370*	0.471	0.011	0.256
	(1.094)	(0.229)	(1.768)	(1.605)	(0.047)	(1.212)
log of total assets in t-1	1.395***	1.026***	0.668***	1.299***	0.924***	0.599***
	(4.908)	(4.529)	(2.988)	(4.937)	(4.329)	(2.893)
Observations	137,023	136,288	136,288	134,687	133,956	133,956
Kleibergen-Paap rk Wald F stat	123.9	121.7	121.7	216.5	211.9	211.9
Executive × Firm FE	YES	YES	YES	YES	YES	YES
Industry × Position × Year FE	YES	YES	YES	YES	YES	YES

Table 4: Trade associations and compensation peers

This table examines how trade association membership affects peer selection in compensation design using firm-pair-year panel data. We distinguish between two types of peers: RPE peers are firms used to assess an executive's performance relative to others, while compensation benchmark peers are firms used as references to set pay practices, levels, and structure. Columns (1)–(2) report first-stage results for the geographic diffusion and board connection instruments, respectively, where the dependent variable equals one if two firms share a trade association membership. The instruments are constructed as products of the corresponding firm-level instruments. Columns (3)–(8) report second-stage results. Columns (3)–(4) examine whether firms select each other as RPE peers. Columns (5)–(6) examine whether firms select each other as general compensation benchmark peers. Columns (7)–(8) examine whether firms use the same compensation consultant. All specifications include firm-pair and year fixed effects. Standard errors are clustered by firm-pair. *p <.1; **p <.05; ***p <.01.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1 if TA peers		1 if RPE peers		1 if benchmark peers		1 if same consultant	
			GEO inst	OD inst	GEO inst	OD inst	GEO inst	OD inst
GEO inst	0.0004***							
	(42.154)							
OD inst		0.0004***						
		(53.712)						
1 if TA peers in t-1 (pred)			-0.034***	-0.045***	0.049***	0.071***	0.646***	0.708***
			(-4.931)	(-7.959)	(3.819)	(7.173)	(54.620)	(72.791)
Observations	25,870,469	26,763,207	25,870,469	26,763,207	25,870,469	26,763,207	25,870,469	26,763,207
R-squared	0.504	0.505						
Kleibergen-Paap rk Wald F stat			3653.3	5889.5	3653.3	5889.5	3653.3	5889.5
Pair of Firms FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES

Table 5: Trade associations and ex-post realized pay

This table examines the sensitivity of realized executive pay to own-firm and peer performance. The dependent variable is log realized pay, defined as salary plus discretionary bonus, other compensation, performance-based bonus payouts (after performance realization), market value of vested stock, market value of exercised options, and change in pension value. Column (1) examines the effect of average TNIC2 peer returns. Column (2) examines the effect of average trade association peer returns. Column (3) decomposes industry peer returns into those from peers who are also TA members (setting to zero if the focal firm has no TA peers) and those from non-TA peers (setting to zero if all TNIC2 peers are TA peers). We also include control indicator variables for when these are set to zero. All specifications include executive × firm and industry × position × year fixed effects. Standard errors are clustered by executive. *p <.1; **p <.05; ***p <.01.

	Log total pay realization		
	(1)	(2)	(3)
Annual return	0.099***	0.099***	0.099***
	(11.108)	(11.139)	(11.134)
Avg annual return TN2 peers	-0.022**		
	(-2.414)		
Avg annual return TA peers		0.043**	
		(2.313)	
Avg annual return of TA TN2 peers			0.018*
			(1.694)
Avg annual return of non-TA TN2 peers			-0.026***
			(-2.866)
1 if TA return set to 0		-0.009	
		(-0.750)	
1 if TA TN2 return set to 0			-0.002
			(-0.157)
1 if non-TA TN2 return set to 0			-0.047
			(-0.486)
Observations	91,499	91,499	91,499
R-squared	0.859	0.859	0.859
Executive × Firm FE	YES	YES	YES
Industry × Position × Year FE	YES	YES	YES

Table 6: Trade associations and pay structure

This table presents the results of the 2SLS estimation of the effects of trade associations on pay structure using executive-firm-year panel data. Panel A uses the Geographic diffusion instrument and Panel B the Board connections instrument. For the dependent variables, we consider each pay component as a fraction of total compensation. Everything is measurable before the pay realization. We include executive × firm fixed effects and industry × position × year fixed effects (industry: SIC-4; position: CEO, CFO, director, other). The instrumented number of associations is standardized. All variables are winsorized at the 1%–99% level. Standard errors are clustered by executive and reported in parentheses. *p <.1; **p <.05; ***p <.01.

Panel A: GEO instrument

	Equity incentives			Non-equity incent		Fixed compensation		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Perf stock /total	Rest stock /total	Options /total	Perf bonus /total	Disc bonus /total	Salary /total	Other /total	Pension /total
# associations (pred) in t-1	-0.0045***	0.0047***	0.0041***	-0.0013	0.0028**	-0.0028**	-0.0019***	-0.0012***
	(-3.3716)	(3.3666)	(3.5886)	(-1.4063)	(2.3374)	(-2.5060)	(-2.6195)	(-2.6353)
log of firm age in t-1	0.0134***	0.0169***	-0.0238***	0.0054***	-0.0094***	-0.0084***	0.0078***	0.0002
	(5.1317)	(5.8002)	(-10.6280)	(2.9198)	(-4.8635)	(-3.9942)	(5.9489)	(0.3058)
log of total assets in t-1	0.0147***	0.0149***	0.0005	-0.0038**	-0.0064***	-0.0147***	-0.0042***	-0.0008
	(6.4807)	(6.2596)	(0.2383)	(-2.4310)	(-3.7358)	(-7.7592)	(-3.8428)	(-1.4096)
Observations	151,759	151,759	151,759	151,759	151,759	151,759	151,759	151,759
Kleibergen-Paap rk Wald F statistic	146.6	146.6	146.6	146.6	146.6	146.6	146.6	146.6
Executive × Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry × Position × Year FE	YES	YES	YES	YES	YES	YES	YES	YES

Panel B: OD instrument

	Equity incentives			Non-equity incent		Fixed compensation		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Perf stock /total	Rest stock /total	Options /total	Perf bonus /total	Disc bonus /total	Salary /total	Other /total	Pension /total
# associations (pred) in t-1	-0.0039***	0.0025*	0.0097***	-0.0030***	0.0027**	-0.0058***	-0.0016**	-0.0018***
	(-2.9052)	(1.8029)	(7.4620)	(-3.3027)	(2.5634)	(-5.1205)	(-2.3587)	(-4.0582)
log of firm age in t-1	0.0169***	0.0185***	-0.0289***	0.0056***	-0.0093***	-0.0087***	0.0082***	0.0006
	(6.4979)	(6.2814)	(-12.1127)	(2.8999)	(-4.7866)	(-4.0481)	(6.5061)	(0.8818)
log of total assets in t-1	0.0132***	0.0163***	-0.0022	-0.0037**	-0.0051***	-0.0123***	-0.0043***	-0.0006
	(6.1479)	(7.0516)	(-1.0681)	(-2.4046)	(-3.2015)	(-6.4494)	(-4.0988)	(-1.1911)
Observations	153,338	153,338	153,338	153,338	153,338	153,338	153,338	153,338
Kleibergen-Paap rk Wald F statistic	243.7	243.7	243.7	243.7	243.7	243.7	243.7	243.7
Executive × Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry × Position × Year FE	YES	YES	YES	YES	YES	YES	YES	YES

Table 7: Trade associations and ex-ante total pay

This table examines the effect of trade associations on total compensation levels and dynamics. Panel A reports the effect on log total ex-ante pay, measured as the sum of salary, discretionary bonuses, other compensation, performance-based bonuses valued at the ex-ante performance target value (the expected performance level that earns 100% of the award, before pay realization), restricted stock and options awards (measured at grant-date market value), performance-based stock awards value at the ex-ante target value, and pension changes. Panel B examines how total pay growth from year t to t+1 responds to peer performance in year t, interacted with trade association exposure. The specifications test whether boards reward managers for TA peer success and penalize them for non-TA peer success, controlling for own-firm returns. All specifications include executive × firm and industry × position × year fixed effects. Standard errors are clustered by executive. *$p<.1$; **$p<.05$; ***$p<.01$.

Panel A: Log of total ex-ante pay

	(1) GEO inst	(2) OD inst
# associations (pred) in t-1	0.0160***	0.0336***
	(2.6230)	(6.2795)
log of firm age in t-1	0.0313***	0.0334***
	(3.0907)	(3.1960)
log of total assets in t-1	0.1410***	0.1307***
	(16.4736)	(15.1943)
Observations	151,759	153,338
Kleibergen-Paap rk Wald F statistic	143.6	243.7
Executive × Firm FE	YES	YES
Industry × Position × Year FE	YES	YES

Panel B: (Total ex-ante pay in t+1)/(total ex-ante pay in t)

	(Total ex-ante pay in t+1) /(total ex-ante pay in t)		(Avg pay in t+1,t+2) /(total ex-ante pay in t)		(Avg pay in t+1,t+2,t+3) /(total ex-ante pay in t)	
	(1) GEO inst	(2) OD inst	(3) GEO inst	(4) OD inst	(5) GEO inst	(6) OD inst
(# associations (pred) in t-1)x(avg TN2 TA return)	0.0057**	0.0028	0.0060**	0.0054**	0.0073**	0.0092***
	(2.3606)	(1.2756)	(2.4572)	(2.4681)	(2.4441)	(3.3501)
(# associations (pred) in t-1)x(avg TN2 non-TA return)	-0.0026*	-0.0034**	-0.0045***	-0.0049***	-0.0030*	-0.0037**
	(-1.6605)	(-2.2682)	(-2.8392)	(-3.3095)	(-1.7329)	(-2.2847)
# associations (pred) in t-1	0.0056	0.0001	0.0034	-0.0032	0.0023	-0.0087
	(1.2000)	(0.0218)	(0.6885)	(-0.6640)	(0.3746)	(-1.4179)
avg TN2 TA return	-0.0568***	-0.0289	-0.0430*	-0.0376	-0.0514*	-0.0737***
	(-2.6401)	(-1.3323)	(-1.8834)	(-1.6394)	(-1.8984)	(-2.6803)
avg TN2 non-TA return	0.0135	0.0201*	0.0230**	0.0284***	0.0285***	0.0380***
	(1.1695)	(1.7422)	(2.2988)	(2.8269)	(2.6221)	(3.6032)
Annual return	0.0317***	0.0290***	0.0114	0.0113	-0.0010	0.0007
	(4.2993)	(3.9165)	(1.5578)	(1.5407)	(-0.1272)	(0.0915)
Observations	88,092	88,478	71,453	71,952	58,093	58,628
Kleibergen-Paap rk Wald F statistic	39.4	53.2	32.0	42.9	22.6	30.8
Executive × Firm FE	YES	YES	YES	YES	YES	YES
Industry × Position × Year FE	YES	YES	YES	YES	YES	YES

Table 8: Trade associations, RPE compensation, and product life cycle

This table examines whether the effect of trade associations on RPE compensation varies with firm life cycle stage. We use the product life cycle measures of Hoberg and Maksimovic (2022): Life 1 (product development/innovation), Life 2 (process optimization), Life 3 (maturity with stable products), and Life 4 (decline). The dependent variable is the fraction of performance-based pay tied to RPE against trade association peers. Columns (1) and (4) interact predicted trade association membership with a combined indicator for Life 2 and Life 3 stages. We examine life2 and life3 due to our predictions that trade associations have a strong focus on efficiency (relevant to Life2) and incentives for industry governance are stronger when business models are stable (more likely in the mature stage Life3). Columns (2)–(3) and (5)–(6) examine Life 2 and Life 3 separately. Columns (1)–(3) use the geographic diffusion instrument; columns (4)–(6) use the board connections instrument. All specifications include executive × firm and industry × position × year fixed effects. Standard errors are clustered by executive. *p <.1; **p <.05; ***p <.01.

	DEP: RPE compensation (TA peers)/perf-based compensation					
	GEO instrument			OD instrument		
	(1)	(2)	(3)	(4)	(5)	(6)
# associations (pred) in t-1	-0.518**	-0.883***	-0.534**	-0.306*	-0.457***	-0.636***
	(-2.301)	(-3.498)	(-2.446)	(-1.668)	(-2.707)	(-3.293)
(# associations (pred) in t-1)x(life2 + life3 in t-1)	-0.424*			-0.528**		
	(-1.868)			(-2.392)		
(# associations (pred) in t-1)x(life2 in t-1)		0.287			-0.441*	
		(1.172)			(-1.752)	
(# associations (pred) in t-1)x(life3 in t-1)			-0.850***			0.059
			(-2.768)			(0.235)
life2 + life3 in t-1	-0.254			0.400		
	(-0.183)			(0.302)		
life2 in t-1		-0.320			3.562**	
		(-0.187)			(2.306)	
life3 in t-1			-0.850***			0.059
			(-2.768)			(0.235)
log of firm age in t-1	0.164	0.169	0.181	0.082	0.103	0.053
	(0.486)	(0.505)	(0.535)	(0.248)	(0.314)	(0.161)
log of total assets in t-1	0.980***	0.993***	1.013***	0.860***	0.833***	0.884***
	(3.422)	(3.462)	(3.527)	(3.224)	(3.161)	(3.330)
Observations	98,593	98,593	98,593	97,035	97,035	97,035
Kleibergen-Paap rk Wald F statistic	47.7	47.3	47.5	88.6	87.9	87.0
Executive × Firm FE	YES	YES	YES	YES	YES	YES
Industry × Position × Year FE	YES	YES	YES	YES	YES	YES

Table 9: Trade associations and industry-governance stability

This table examines whether trade associations promote stability in governance mechanisms more broadly. This prediction arises because increased stability is required to facilitate the longer term value maximization and relationship building that collaborative activities entail. Columns (1)–(2) examine average vesting time (in months) of equity awards. Columns (3)–(4) examine whether the firm has a classified (staggered) board following Guernsey et al. (2023). Columns (5)–(6) examine whether the firm was involved in a hostile acquisition (as target or acquirer). Columns (7)–(8) examine industry-level director network density (TNIC2 overlapping-director network density following Cabezon and Hoberg (2025)). For columns (7)–(8), the key independent variable is instrumented TNIC2 trade association network density. The instrument for this specification is the average of firm-level instruments across all TNIC2 peers. Odd columns use the geographic diffusion instrument; even columns use the board connections instrument. All specifications include executive × firm and industry × position × year fixed effects. Standard errors are clustered by executive. *$p<.1$; **$p<.05$; ***$p<.01$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Awards vesting time		1 if class board		Hostile M&A		TN2 OD density	
	GEO inst	OD inst	GEO inst	OD inst	GEO inst	OD inst	GEO inst (TN2 avg)	OD inst (TN2 avg)
# associations (pred) in t-1	0.979***	0.760***	0.005*	0.004*	-0.001**	-0.001***		
	(5.412)	(5.283)	(1.663)	(1.803)	(-2.301)	(-3.472)		
TN2 TA density (pred)							0.032**	0.068***
							(2.284)	(4.962)
log of firm age in t-1	0.938***	1.052***	-0.008	-0.008	-0.001	-0.000	-0.000*	-0.000**
	(3.229)	(3.770)	(-1.486)	(-1.430)	(-1.121)	(-0.636)	(-1.954)	(-2.270)
log of total assets in t-1	-0.193	-0.034	-0.004	-0.003	0.003***	0.003***	-0.001***	-0.001***
	(-0.762)	(-0.143)	(-0.841)	(-0.808)	(4.227)	(4.133)	(-3.628)	(-4.156)
Observations	133,916	133,916	136,035	136,035	153,444	155,024	106,450	106,413
Kleibergen-Paap rk Wald F stat	125.6	211.8	146.9	228.4	151.1	248.9	99.8	252.2
Executive × Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry × Position × Year FE	YES	YES	YES	YES	YES	YES	YES	YES

Table 10: Trade associations, incentives, and industry performance

This table presents the results of the 2SLS estimation of the effects of performance-based compensation on industry and firm performance using the 2017 Tax Cuts and Jobs Act (TCJA) as a quasi-natural experiment, as described in section 3.5. Panel A reports the first-stage estimation of equation (3), where the dependent variable is the fraction of each executive's pay that is in instruments that are treated by the TJCA rule change regarding taxation of incentive pay. This quantity "TJCApay" is the fraction of total compensation in the following buckets: performance stock, options, and performance bonuses. Panels B and C report the second-stage estimation of equation (4). Panel B examines industry-level performance measured as average performance across TNIC2 peers (excluding the focal firm). Panel C examines firm-level performance relative to industry, defined as focal firm performance minus TNIC2 average performance. Performance measures include sales growth (log(Sales/Lagged Sales)), ROE (OIBDP/Equity), R&D intensity (R&D/Lagged Assets), and advertising intensity (Advertising/Lagged Assets). The sample period is 2014-2020, excluding 2017. Panel A includes executive × firm, firm × year, and industry × position × year fixed effects. Panels B and C include executive × firm and position × year fixed effects. Standard errors are clustered by executive. *p <.1; **p <.05; ***p <.01.

Panel A: First stage

	(1) TJCApay
(Treated)x(post 2017)	-0.017***
	(-3.808)
Observations	33,670
R-squared	0.921
Executive × Firm FE	YES
Firm × Year FE	YES
Industry × Position × Year FE	YES

Panel B: Second-stage industry performance

	(1) TN2 Sales Gr	(2) TN2 ROE	(3) TN2 XRD/at	(4) TN2 XAD/at
(TJCApay (pred))x(nassn in 2016)	0.116**	1.749*	0.008**	0.003**
	(2.418)	(1.859)	(2.539)	(1.977)
TJCApay	0.471	-1.325	-0.000	-0.002
	(1.121)	(-0.348)	(-0.007)	(-0.261)
Observations	30,967	30,972	30,972	30,437
Kleibergen-Paap rk Wald F stat	13.0	13.0	13.0	12.9
Executive × Firm FE	YES	YES	YES	YES
Position × Year FE	YES	YES	YES	YES

Panel C: Second-stage firm performance

	(1) Firm-TN2 Sales Gr	(2) Firm-TN2 ROE	(3) Firm-TN2 XRD/at	(4) Firm-TN2 XAD/at
(TJCApay (pred))x(nassn in 2016)	-0.159***	-2.236*	-0.014***	-0.004
	(-3.116)	(-1.872)	(-3.635)	(-0.956)
TJCApay	4.172**	7.711	0.552***	0.237***
	(2.396)	(1.422)	(4.385)	(2.920)
Observations	30,251	30,391	30,400	13,984
Kleibergen-Paap rk Wald F stat	14.3	13.9	14.0	14.0
Executive × Firm FE	YES	YES	YES	YES
Position × Year FE	YES	YES	YES	YES