CEO-Firm Matches: Evidence from Competition Shocks

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Competition shocks fundamentally alter the nature of a firm's strategy; an increase (decrease) in competition shifts firms' focus from long-term growth (short-term performance) to short-term performance (long-term growth). Using major decreases and increases of import tariffs as quasi-natural experiments, this paper documents a non-monotonic relationship between competition and the probability of CEO turnover. Based on CEOs' prior experience, I construct two indices of skills: 1) skills that are suitable for high-competition and short-term performance, and 2) skills that are desirable for low-competition and long-term growth. I find that firms are more likely to retain a CEO or appoint a candidate with high-competition (low-competition) skills following a tariff cut (increase). Using family firms as instruments for the quality of CEO-firm matches, I find that firms run by CEOs with relevant skills outperform those run by CEOs who lack those skills. Because turnovers are costly, firms change their CEOs if the benefits of a CEO with relevant skills outweigh the costs. I examine whether firms that retain their CEOs alternatively change their compensation plan to motivate CEOs to deliver appropriate strategies. I find that financial conditions and CEO power prevent firms from implementing compensation schemes that promote optimal strategies following competition shocks.

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Dedication

To the kindest and most supportive father Ali, and mother Zahra

To the most beautiful and loving fiancée Elnaz

To the most encouraging and caring brother Saeed, and sister Sara

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1.0 Introduction

Prior literature examines whether and how chief executive officers (CEOs) affect corporate policies and performance.[1] One strand of this literature documents that CEOs' personal characteristics and traits play a role in corporate decisions.[2] Another strand examines whether and how CEOs' career experiences affect firm performance and value.[3] However, little evidence exists regarding the value of specific experiences that CEOs acquire throughout their careers. In this paper, I contribute to the latter strand by exploring whether prior experience operating in relevant competitive conditions influences the CEO-firm match and the resulting firm performance.

A good board of directors (board) continually assesses the CEO-firm match and takes necessary actions to improve that match (Hermalin and Weisbach, 2014; Denis et al., 2015). CEOs with certain characteristics and experiences are chosen endogenously based on firms' needs and replaced when those needs change sufficiently. Changes in industry conditions can result in mismatches between what individual firms need and what their current CEOs offer. In this paper, I investigate a CEO-firm mismatch that arises when a firm experiences a major competition shock and examine the previously unexplored role of CEOs' experiences in firms' hiring and firing decisions.

Tariff changes are plausibly exogenous shocks to competition and provide a unique setting in which to study CEO-firm matches. Tariffs are typically politically motivated and are decided during bilateral or multilateral trade negotiations (Krugman et al., 2012). Thus, they are perceived to be exogenous to a firm's policy (Frésard and Valta, 2013) and cannot

[1] Bertrand and Schoar (2003), Adams et al. (2005), Bennedsen et al. (2012), Fee et al. (2013), Jenter et al. (2016), Limbach et al. (2017).

[2] For instance, see Malmendier and Tate (2005) on CEOs' education, Malmendier and Tate (2005); Goel and Thakor (2008); Gopalan and Xie (2011); Hirshleifer et al. (2012); Phua et al. (2018) on overconfidence, Malmendier et al. (2011) on CEOs who were raised during the Great Depression, Cronqvist et al. (2012) on CEOs' leverage preference, Graham et al. (2013) on optimism and risk aversion, Yim (2013) on CEOs' age, Benmelech and Frydman (2015) on CEOs who were drafted in a military, Sunder et al. (2015) on sensation seeking.

[3] Custódio et al. (2013), on financial experience, Dittmar and Duchin (2015) on CEOs who experience distress, Kaplan et al. (2012), Custódio et al. (2015), and Guay et al. (2013) on generalist vs specialist CEOs, Islam and Zein (2017) on inventor CEOs.

be predicted solely based on industry or market conditions (Xu, 2012). Tariff cuts lower trade barriers and increase import penetration, causing domestic firms to face higher product market competition. Following tariff cuts, firms, on average, experience reductions in return on assets, market to book ratio, and sales. To survive, firms are forced to focus on short-term performance by improving their operating efficiency and cutting capital expenditures and employment (Hombert and Matray, 2018). Hombert and Matray show that these effects are smaller for firms that have invested in R&D before tariff cuts. In contrast, tariff increases lower import penetration and competition from low-cost foreign producers. To exploit the window of opportunity created by tariff increases, firms shift their focus toward long-term performance and invest heavily in R&D to update their technology and take advantage of higher growth opportunities (Mergent, 2004). Firms, on average, experience higher return on assets, market to book ratio, and sales (Xu, 2012).

Overall, tariff changes fundamentally alter the nature of a firm's strategy to the extent that a current CEO could lack the experience and skills needed to operate the firm successfully, causing a CEO-firm mismatch. If it takes time for managers to acquire the necessary skills, and if the benefits of hiring a new CEO outweigh the costs of laying off the incumbent CEO, CEO turnover will increase following tariff changes. I use major changes in import tariffs between 1993 and 2005 to examine the relationship between CEO experience, CEO turnover, and competition in manufacturing firms.

Using the difference-in-difference (DID) method, I estimate changes in the likelihood of CEO turnover in the first three years following a tariff change. Consistent with the findings of Dasgupta et al. (2017), I find that the probability of CEO turnover is 146% higher after a tariff cut. They attribute their finding to the discipline imposed by greater competition. However, I find that the likelihood of CEO turnover is also 117% higher following a tariff increase. These combined findings suggest that major changes in product market competition in either direction alter the skills that top management requires to operate the firm effectively.

This non-monotonic relationship between competition and CEO turnover can be explained in the context of the moral hazard model of Anderson et al. (2018) and the productivity model of Eisfeldt and Kuhnen (2013). Anderson et al. (2018) propose a model in which firms must change their management to focus on long-term growth. They find that

"firms with better growth prospects experience higher CEO turnover." Eisfeldt and Kuhnen (2013) develop a competitive assignment model in which changes in industry conditions are shocks to firms' skill demand. Following such changes that shift the focus toward short-term performance, some firms will find it worthwhile to fire their CEOs and hire new CEOs with the desirable skill set (i.e., cost-cutting skills). The underlying assumption in both of these models is that CEOs cannot acquire the required skill set quickly enough after a change in conditions. Guay et al. (2013)'s findings support this assumption by showing that CEO turnover is more likely after a shock to industry investment, competition, or growth.

My research setting allows me to build on the literature that emphasizes the importance of top management's experience in corporate outcomes (Dittmar and Duchin, 2015; Custódio et al., 2013). I examine whether prior experience operating in relevant competitive conditions affects: 1) the likelihood that prior CEOs are retained, 2) the probability that CEO candidates are hired, and 3) firm performance following changes in competitive conditions.

I hypothesize that a CEO who has previously faced a similar competition shock will be more likely to have developed the relevant skills and, therefore, more likely to be a good match for the firm. To disentangle CEOs' effects from firms' effects, I follow Dittmar and Duchin (2015) and look at competition shocks that a CEO faced before joining the current firm. I construct two indices for CEO skills: 1) an index for skills suitable for high competition, such as cost-cutting, that are desirable for improving short-term performance; 2) an index for skills suitable for low competition, such as evaluating innovative projects, skills that are required for creating and exploiting long-term growth opportunities.[4]

To construct an index for CEO skills suitable for high competition (i.e., high-competition skills), I consider the first factor of a principal component analysis (PCA) of six aspects of a CEO's experience: whether the CEO has experienced a tariff cut (1), a negative sales shock (2), and high competition (Herfindahl-Hirschman index) (3); whether the CEO has worked in a firm that engaged in asset sales (4), and in a firm that had low costs of goods sold (5), and low selling, general and administrative expenses (6) per one unit of sales.[5] Working in these

[4]Hereafter, "high-competition skills," "short-term skills," "cost-cutting skills," "skills suitable for high competition," and "skills suitable following a tariff cut" are used interchangeably. So are "low-competition skills," "long-term skills," "skills suitable for low competition" and "skills suitable following a tariff increase".

[5]Experiences at any level of management are considered to construct an index.

conditions is deemed to prepare the CEO for high import competition. Similarly, I proxy for CEO skills suitable for conditions caused by a tariff increase (i.e., low-competition skills) using the first factor of PCA of the following aspects: whether the CEO has experienced a tariff increase (1); and whether the CEO has worked in a firm with high growth opportunities (2), and with high R&D expenses (3). I assume that in every industry, CEOs whose factors are in the top quartile are more likely to have developed the desired skill set.

I find significant variation across CEOs in regard to their low-competition and high-competition skills, as well as a correlation between low-competition and high-competition skills and the level of market competition. CEOs with comparable high-competition (low-competition) skills also seem to have a wide range of low-competition (high-competition) skills, and firms prioritize the low-competition or high-competition skill set based on the level of competition in the market. The average low-competition index for CEOs in my sample period rose, whereas the average high-competition index went down. On average, CEOs had more high-competition skills in the early 1990s when firms faced higher competition because of the commencement of the North American Free Trade Agreement (NAFTA) in 1994 and the World Trade Organization (WTO) in 1995. By the late 1990s and early 2000s, CEOs, on average, had higher low-competition skills, which is concurrent with the start of the internet and with the reversal of tariff reductions implemented in the early 1990s.

I examine whether CEOs' prior experience as proxied by these two indices affects the likelihood of CEO turnover. Using the triple difference method, I find that the likelihood of CEO turnover following a tariff cut is 76% lower for CEOs who have previously experienced a tariff cut. Similarly, a CEO with relevant experiences does not face a higher probability of turnover during the three years following a tariff increase. The results are robust to adding a battery of controls, to varying the length of the period during which CEO experience is measured (5, 10, or 15 years), to using a Probit model rather than linear probability models, to using only experience acquired as an executive (i.e., CEO, CFO, COO, CTO), to using capital expenditures as another component of skills, and to using above the median rather than the top quartile as a cutoff for skills. These results indicate that boards consider prior experience in relevant competitive conditions in matching CEOs to their firms.

Next, I investigate the role of a CEO candidate's skills in firms' hiring decisions. I find

that firms that experience a tariff cut and need to improve high-competition performance are more likely to hire a CEO candidate whose cost-cutting skill is better than the skill of the departing CEO. Similarly, firms that experience a tariff increase are more likely to select a CEO candidate with low-competition skills. It is possible that a specific trend in industry conditions led to both a change in import tariffs and the demand for certain skills. To rule out this possibility, I compare the average high-competition and low-competition indices of the CEOs in industries that experience a tariff shock to those of CEOs in similar industries that do not experience a competitive shock. In an industry that experiences a tariff cut (increase), firms are more likely to appoint a CEO with high-competition skills (low-competition skills). These results provide further evidence on the importance of CEOs' prior experience in relevant competitive conditions.

To explore whether CEOs' competitive skill sets have real effects on firm performance, I follow the methodology used by Denis and Denis (1995) and Bennedsen et al. (2012) and examine relative changes in return on assets (ROA) and Tobin's Q. Specifically, I answer the question of whether firms run by CEOs with relevant competitive skills perform better after an exogenous competition shock. First, I explore whether there is a relationship between performance and managerial competitive skill sets. Because CEO-firm matches are endogenous, this set of results should be construed as correlations. Next, I exploit variation in costs of hiring a new CEO as an instrument to establish a causal relationship between CEOs' skill and firm performance.

Consistent with the prior literature (Frésard and Valta, 2013), I find that returns on assets decrease by 58% in the first three years after a tariff cut. However, firms run by CEOs with cost-cutting skills do not experience lower returns. Firm fixed effects partially address the concern that a CEO with a suitable skill set for highly competitive conditions may join a firm that outperforms others following a tariff cut. Similarly, I find that after tariff increases, the M/B ratios of firms run by CEOs with the relevant skills increase by 60%, versus an increase of only 30% for firms run by CEOs who lack the experience. The results are robust to adding control variables, as well as industry-year fixed effects, and using alternative definitions of performance.

I also examine separately two sets of firms: 1) firms who hire new CEOs following

tariff changes and 2) firms that do not have CEO turnover in the three years after tariff changes. I hypothesize that in each set, CEOs who have relevant competitive experience and, therefore, relevant skills will outperform those who lack such experience. Using propensity score matching, I compare changes in ROA and Tobin's Q for the two groups of firms. I find that the three-year average return (Tobin's Q) for firms that hire a CEO with the desirable skill set is 4.1 percentage points (38%) higher than firms that hire a CEO who lacks such skills following a tariff cut (increase). However, these results can be attributed to effects of CEO turnover on firm performance and not CEOs' skills. To disentangle turnover effects from CEOs' skill effects, I examine changes in performance for firms that do not experience CEO turnover. Firms run by a CEO with the relevant skill when tariff shocks occur outperform those run by a CEO without the skill.

Overall, the performance results suggest that CEOs' experience operating in relevant competitive conditions are positively correlated with firm performance. However, CEOs whose careers have survived prior competitive shocks may be more talented than other CEOs. If this is the case, the reduced turnover and increased performance that I document could be due to innate talent (e.g., intelligence), rather than to skills generated through relevant experience. If my results reflect innate talent rather than skill, CEOs who have experienced tariff cuts (increases) should have lower turnover and higher performance in all situations, including following tariff increases (cuts). In contrast, I find that cost-cutting experience increases the probability of CEO turnover and has no effects on firm performance following tariff increases. Similarly, experience relevant to long-term growth has negative effects on firm performance after a tariff cut. This suggests that the skills generated through prior experience in relevant competition environments are valuable in and of themselves.

Because firms hire a new CEO with a particular skill set in response to changes in firm needs, the endogeneity problem of CEO matching is more severe in the first few years post-appointment. To partially address the endogeneity concern, I exclude the first three years of CEO tenure and also use better control groups. I only include control firms, like treated firms, that hire a CEO with relevant competitive experience. If differential performance is driven by firm characteristics and not by CEO experience, we would not expect to observe any performance difference between treated and control firms following a competition shock.

The first control group includes firms that are in the same industry as treated firms and hire a CEO with a relevant skill set right before the shock (year t or year t-1). So, the only difference between control and treated firms is CEO tenure, which is shorter for control firms. In contrast to the notion that firm heterogeneity drives differential performance, treated firms (firms with longer CEO tenure) outperform control firms (firms with short CEO tenure) at first, but the difference in performance fades away over time. These results provide evidence that managerial competitive experience positively affects performance and that it takes time for CEOs to imprint their styles on firm policies. The second control group includes firms that hire a CEO with a similar skill set and operate in industries that do not experience a competition shock. The results show that CEOs with high (low) competitive skills do better only following a significant increase (decrease) in competition, providing more evidence that managerial competitive skills are not a proxy for talent.

The correlation between CEO competitive experience and firm performance can be interpreted in three ways. First, CEO competitive experience may be merely a reflection of firm heterogeneity correlated with performance: certain firm characteristics lead to both hiring a CEO with relevant competitive experience and better performance following a competition shock. This cannot be the case because firms that hire a CEO with relevant competitive skills have similar characteristics, including performance, to those of firms that do not change their CEOs and because managerial competitive skills are associated with an improvement in performance post-appointment. Second, CEO competitive experience can affect firm performance, but my measure of competitive experience is a proxy for talent: scarce, talented CEOs can improve firm performance regardless of industry and firm conditions. That is, CEOs can be ranked vertically, and talented CEOs are capable of delivering higher performance, but because the number of talented CEOs is limited, some firms cannot hire a talented CEO, resulting in differential performance across firms. This explanation cannot be true either. The results show that CEOs with high and low competitive skills are likely to do better only after competition shocks when these skills are requisite for success. The third interpretation, which is supported by the results, is that CEO competitive experience affects firm performance and that the quality of CEO-firm matches drives differential performance across firms. CEOs can be ranked horizontally, and firms select a CEO with a particular

skill set based on firm and industry conditions, but because of frictions in the CEO market, some firms may not be able to hire a CEO with the desirable skill set. I further examine the third channel using an exogenous variation in CEO-firm matches.

To address the endogeneity problem and provide a causal link between managerial experience and firm performance, I propose an instrument for the quality of CEO-firm matches: being a family firm. Because family firms are inclined to appoint a CEO with personal ties, they behave as if their costs of CEO turnover are much higher than those of non-family firms. Therefore, they are less likely to appoint a CEO with a relevant skill set following competition shocks and, consequently, more likely to have poor CEO-firm matches. This guarantees that the instrument satisfies the relevance criterion: the instrument should be correlated with the quality of CEO-firm matches. It seems difficult to find a convincing firm-level instrument for the quality of CEO-firm matches that satisfy the exclusion restriction assumption: the instrument should not affect firm performance through channels, other than the quality of CEO-firm matches, that are not controlled for. However, I argue that being a family firm satisfies this assumption when I control for CEO power, firm prior performance and financial conditions, and entrenchment in my empirical setting.

To account for the binary nature of my skill variables, I use a modified version of the two-stage least squares (2SLS). In the first step, I use the instrument and a non-linear model (i.e., Probit) to estimate fitted values of the likelihood of having a CEO with high- and low-competitive skills. Next, I plug these fitted values as instruments in a conventional 2SLS. The results support the idea that firms run by CEOs with high-competition (low- competition) skills perform better after a tariff cut (increase). Overall, the findings from instrumental variable estimations provide the first evidence of causal links between managerial competition experience and firm performance.

Thus far, we have seen that CEO-firm mismatches impair firm performance. However, sometimes firms optimally decide not to improve the quality of the CEO-firm match if costs associated with CEO turnover outweigh benefits because either costs are too high or benefits are too small. Costs of CEO turnover can be direct costs, such as searching for a new CEO and severance package (Eisfeldt and Kuhnen, 2013), or indirect costs, such as managerial entrenchment, and personal and professional bonds between the CEO and

the board. Moreover, firm characteristics (e.g., location, financial conditions) and industry characteristics (e.g., the number of firms, the level of competition) may affect turnover costs. For instance, if a considerable number of firms in an industry decide to hire a CEO with a certain skill set at the same time, the higher demand leads to higher bargaining power and, consequently, higher compensation for candidates. Taylor (2010) finds that "boards behave as if firing a CEO costs shareholders an estimated 5.9% of firm assets." If that is the case, firms must be more likely to improve the quality of CEO-matches when the benefits are higher. I replicate my baseline results using smaller and larger import tariff shocks. Firms are more likely to have CEO turnover following a large shock than a small shock. The underlying assumption is that the magnitude of competition shocks does not affect equally benefits and costs of CEO turnover, resulting in larger changes in benefits of CEO turnover. Firm performance is also affected more negatively (positively) following a large tariff cut (increase), magnifying the benefits of better CEO-firm matches.

Considering the costs and benefits of a wide range of responses, firms respond optimally and differently to tariff shocks (Bloom and Van Reenen, 2007). Because benefits of a CEO with certain skills depend on firm and industry characteristics, even firms with comparable turnover costs may behave differently. The difference between the incumbent CEO's skill set and that of a CEO candidate may be the main driving force for the potential benefits. However, the realization of these benefits depends on industry conditions (e.g., the level of competition, product substitutability) and on firm characteristics (e.g., the number of business segments and products, market share, financing options, financial conditions). For instance, the ability to secure means and financial resources that are requisite for implementing optimal strategies following a competition shock dictates the range of optimal responses. If firms become financially constrained due to lower sales following a tariff cut and cannot attract an eligible candidate to deliver optimal strategies, they may opt for a less expensive, albeit less beneficial response than turnover. As an alternative, changing compensation scheme seems to be a viable solution to a competition shock.

Prior theoretical papers argue that product market competition can affect CEO compensation (total compensation) through three channels (Hart, 1983; Hermalin, 1992; Schmidt, 1997). First, competition has two contrasting effects on the information structure of the

incentive scheme: depending on management utility functions and market structure, competition can allow either shareholders to more accurately infer managerial effort or managers to hide their lack of effort, making the net information effect of competition on managerial compensation ambiguous. Second, on the one hand, competition flattens the demand curve (i.e., more elastic) and, consequently, increases the potential quantity of sales for a decrease in prices, giving managers enough incentive to exert more effort (i.e., higher return to effort). This is called "business stealing effect." On the other hand, in a competitive market where rivals offer low prices, firms gain smaller benefits for each unit of sales. The net impact is again ambiguous. Third, competition increases the probability of liquidation, inducing managers to work harder. However, if the liquidation effect resulted from lower profits due to higher competition, then similar to the demand curve channel, the sign of the net effect is not clear. Overall, theoretical predictions about effects of competition on CEO compensation are ambiguous.

In addition to total compensation, competition may impact the composition of CEO compensation. First, given that firms put more weight on cost-cutting (innovative) strategies in response to a sudden increase (decrease) in competition, we would expect firms to offer more short-term (long-term) compensation to CEOs after tariff shocks. Second, to the extent that higher competition causes firms to suffer financially, predictions about optimal managerial compensation schemes for financially constrained firms are applicable to tariff cuts. Similar to financially constrained firms, firms that experience an increase in competition are expected to grant more stock and options (i.e., long-term compensation) to their CEOs (Ellis, 2011). Lastly, managers are skilled at camouflaging their rent extracting practices; they may opt for higher stock and option compensation when firms are short in cash due to higher competition and reward themselves with extra cash when sales are higher due to lower competition. Note that the prediction of the first channel (i.e., the optimal investment channel) is the opposite of the other two.

First, I examine whether firms that retain their CEOs following a tariff change motivate their CEOs to deliver desirable strategies. Consistent with the "business stealing effect" and empirical findings of Cuñat and Guadalupe (2009), firms increase CEOs' compensation following a tariff cut, but not after a tariff increase. Regarding the composition of compen-

sation, firms grant more stock and options (long-term compensation) to CEOs following an increase in competition and offer more cash and bonus (short-term compensation) after a decrease in competition. These findings show that promoting optimal investment strategies is not the first determinant of CEO compensation following competition shocks.

In addition, firms change the sensitivity of pay for performance after tariff shocks: they lower (increase) the sensitivity of pay to short-term performance (i.e., return on assets) and increase (lower) the sensitivity of pay to long-term performance (i.e., Tobin's Q) after a tariff cut (increase). These findings are consistent with CEO power, in which CEOs bargain for a more lenient measure of performance to be used for determining compensation, and in line with Giannetti and Yu (2017)'s findings that firms' focus shifts after a competitive shock. Breaking down compensation into short-term and long-term portions provides similar results and supports the managerial power explanation.

To further examine channels through which competition affects compensation schemes, I investigate how financially constrained firms that retain their CEOs change compensation plans. Financially constrained firms tend to lower the short-term portion of compensation (e.g., bonus, cash) following a tariff cut while offering more stock or options to their CEOs. Moreover, they tend to reward their CEOs with bonus, or cash after a tariff increase while lowering the long-term portion (i.e., stock and option) of compensation. These findings are consistent with managerial power: CEOs camouflage their rent extraction by asking for more stock and options following a tariff cut and reward themselves with bonus and cash after a tariff increase. Overall, the results are not consistent with the idea that firms actively change managerial compensation plans to deliver desirable strategies, but they are in line with the financial constraint and camouflage channels. Given that compounding factors, particularly CEO power, make it hard to isolate the role of competition in compensation plans, we would need a better setting to examine this relationship.

I also investigate the relationship between CEO experience and compensation. While there is a small difference between compensation of CEOs with high-competition skills and that of CEOs who lack these skills before a competition shock, CEOs with high-competition skills receive considerably higher stock and option compensation after a tariff cut. Similarly, CEOs with low-competition skills experience a significant increase in their short-term com-

pensation (i.e., the sum of cash, bonus, salary) after a tariff increase. The results can again be explained by CEO power. CEOs with desirable skill sets have higher bargaining power following a competition shock and camouflage their high compensation by receiving more stock and option compensation when firms are financially struggling due to lower sales after a tariff cut and by receiving more bonus and cash compensation when firms experience a windfall of cash due to higher sales after a tariff increase.

This paper contributes to the literature on CEO turnover and CEO-firm matches. Prior literature documents numerous determinants of CEO turnover: stock returns and accounting performance (Denis and Denis, 1995; Hermalin and Weisbach, 1998), board composition (Hermalin and Weisbach, 1988), corporate governance (Huson et al., 2004), CEO talents (Bushman et al., 2010), and industry performance (Jenter and Kanaan, 2015). More recent papers document the relation between industry shocks and the probability of CEO turnover (Guay et al., 2013; Dasgupta et al., 2017). This paper contributes to the literature by documenting a non-monotonic relationship between competition and CEO turnover and by showing that CEOs' prior experience plays a role in the quality of CEO-firm matches and that firms consider CEOs prior competitive experience in firing and hiring decisions. To the best of my knowledge, this paper is the first to consider the role of both sides (positive and negative) of competition shocks in CEO turnover and provide a causal relationship between CEO turnovers and competition shocks.

This paper is also related to the literature that examines the role of CEO characteristics and experiences in shaping corporate outcomes (Bertrand and Schoar, 2003; Murphy and Zabojnik, 2004; Gounopoulos and Pham, 2018; Islam and Zein, 2017). One strand of this literature focuses on how CEOs' personal traits or experiences affect firm policies. Another strand examines whether the executive decision-making process is influenced by the environment and conditions where executives have worked (Dittmar and Duchin, 2015). I add to this literature by showing that CEO experience operating in relevant competitive conditions is associated with better firm performance. This finding supports the importance of another dimension of CEOs' skills, namely high-competition and low-competition skills.

The present paper sheds light on the role of competition in CEO compensation. Theoretical papers on this topic provide ambiguous predictions because competition most of the

time has conflicting effects on CEO compensation. Competition may increase the elasticity of the demand curve: a firm can sell more by lowering its prices, encouraging the CEO to put more effort. At the same time, competition lowers the profit for each unit of sales, discouraging the CEO from working hard. Similarly empirical findings are mixed (higher, Cuñat and Guadalupe (2009); lower, Lie and Yang (2018)). This paper adds to this literature by providing a non-monotonic relationship between competition, and compensation and the composition of compensation using both positive and negative competition shocks. I provide evidence that firm financial conditions, compared to optimal investment strategies, play a more important role in CEO compensation following competition shocks. In addition, the results show that compensation effects previously attributed to competition may be, in fact, driven by managerial power. CEOs hide their rent extraction by switching between long-term and short-term compensation after positive and negative competition shocks. Overall, the results show that managerial power and financial conditions are two of the main determinants of designing compensation plans after competition shocks.

Finally, this paper contributes to the literature on executive learning and adaptability. General managerial skills have been valued more recently because technological advances make firm-specific knowledge more accessible to executives and, consequently, less important than before (Murphy and Zabojnik, 2004, 2007). Custódio et al. (2013) document higher demands and salaries for CEOs with general managerial skills relative to those for specialized CEOs. To develop a proxy for general managerial skills, these studies focus on the number of firms and industries in which executives have worked. I focus instead on the conditions and circumstances in which executives have worked, and document that experience in relevant competitive conditions has value over and above experience in a particular industry.

2.0 Literature Review and Hypothesis Development

2.1 Competition shocks and firm policies

Reductions of import tariffs considerably increase competition from low-cost foreign manufacturers, wiping out growth opportunities. Higher competition lowers firms' cash flows and profits and increases the probability of bankruptcy. On the other hand, increases of import tariffs undeniably lower foreign competition, providing a short breathing space for firms. Lower competition following a tariff increase results in higher sales and profits. Here, I discuss the theoretical predictions and empirical findings as to how firms respond to these positive and negative competition shocks.

2.1.1 Competition shocks and R&D investment

Even though the question of whether/how competition affects innovation has been received much attention, there is not a definitive answer to this question. The answer depends on the choice of proxies for competitive pressure (e.g., the number of firms, product substitutability, or market concentration), the type of innovation (process or product), and the type of innovative environments (e.g., where ideas are common knowledge or scarce; where there are spillover effects of innovation that benefit other firms) (Tang, 2006). More importantly, there is a two-way relationship between market structure and innovation: the level of competition (e.g., the number of firms) affects firms' incentives to innovate, while at the same time, firms' innovation strategies shape the market structure (which is strategic investments) (Belleflamme and Peitz, 2015). The former pertains to competition environments after tariff cuts where firms have to respond to a sudden increase in competition, while the latter is more appropriate for firms' strategic decisions on R&D investments following a tariff increase.[1]

The negative effect of competition on innovation was first discussed by Schumpeter

[1]For a survey of literature on competition and innovation, see Gilbert (2006)

(1942). He argues that large firms are better equipped to deal with uncertainty and take risky projects such as innovative endeavors and that innovation requires concentrated industries. Put differently, monopoly power might be a pre-condition for innovation. Romer (1990) and Grossman and Helpman (1991) claim that monopoly power creates investment opportunities and that firms pursue innovation to exploit these opportunities. In addition, monopolists have better means to finance innovative projects (Tang, 2006). Overall, monopolists are more likely to find, finance, and undertake innovative opportunities. This effect is called the "Schumpeterian effect": higher competition lowers the benefits of innovation (rents) for laggard firms and thus the incentive to innovate (Dasgupta and Stiglitz, 1980a,b).

Moreover, firms have a higher rate of time preference (i.e., interest rate) following an increase in competition and, consequently, decrease their R&D investments, which mostly consist of projects with long-term payoffs (Aghion et al., 2018). Another proposed reason for higher rates of time preference is uncertainty about firm future cash flows (Thakor and Lo, 2018). Overall, these effects of competition (lower expected profits, higher interest rate, and higher uncertainty about future cash flow) turn some of the previously positive NPV projects into negative ones and thus cause firms to invest less in R&D. These effects are stronger for firms with high debt, causing innovative intensive firms to lower their debt and to hold more cash following an increase in competition (Thakor and Lo, 2018).

The positive effect of competition on innovation was first discussed through its effects on firm future profits: despite the higher ability to innovate, monopolists may not a have stronger incentive to innovate. Arrow (1962) argue that without the strategic consideration of innovation, firms in a competitive market have stronger incentives to innovate than monopolists because the innovation creates a new source of profits for them, whereas it only replaces an existing profit by a slightly larger one for monopolists. This is so-called the "replacement effect." Similarly, Vives (2008) develops a model with and without restricted entry (i.e., without and with strategic consideration) and finds that without strategic consideration, firms lower R&D investments in both Bertrand and Cournot models when competition is measured by the number of firms in the market but not when measured by the substitutability. In addition, with strategic innovation, firms attempt to evade the future lower profits by investing in R&D. Put differently, high competition lowers profit margins

on current products relative to innovative products and thus increases the incentive to innovate (Aghion et al., 2001). This effect is called the "escape-competition effect." Overall, competition increases firms' incentive to innovate by increasing either firms' potential future revenues or their relative profits.

Aghion et al. (2005) reconcile these two contradictory effects of competition on innovation and propose a model in which the relation between competition and innovation is an inverted-U shape. In their model, the difference between pre-innovation and post-innovation rents affects firms' decisions to innovate. When dispersion across firms is low ("neck-and-neck competition"), "escape-competition effect" dominates, whereas "Schumpeterian effect" dominates when dispersion is high. Furthermore, Belleflamme and Vergari (2011) argue that depending on the measure of competition (i.e., the number of firms, and product substitutability), the incentive to innovate can be positively, negatively, or non-monotonically (inverted-U shape) related to the level of competition. There are two opposite forces. First, there is a competition effect: the higher the competition, the lower the profits for both innovating and non-innovating firms. Higher competition will decrease the residual demand for all firms. Second, there is a competitive advantage effect: the higher the competition, the higher the number of inefficient rivals post-innovation. That is, higher competition will increase the demand elasticity, which in turn increases benefits of a price reduction post-innovation. Depending on which channel dominates, the net effects of competition on innovation may be positive, negative, or an inverted U-shape.

Lie and Yang (2017) find empirical supports for the proposed inverted-U shape relationship. They find that firms attempt to escape price competition by investing in R&D when the thread of competition increases, but they lower their R&D investment when the actual competition is high. In other words, when firms anticipate higher future competition from low-wage countries such as China, they implement differentiation strategies to avoid a price war. Firms strategically invest in R&D to change the future competition level. After a tariff increase, firms find a short window of opportunity to invest in R&D to differentiate themselves from the potential future competition from low-cost foreign manufacturers, which is called the "anticipated escape-competition effect" (Aghion et al., 2018). However, when their cash flows fall because of high competition following a tariff cut, they forgo innovation

projects and lower their R&D investment. In this case, competition is forced to firms by the markets, and firms have to react to a sudden increase in competition. This explains why for some firms, the optimal strategy should be to lower their R&D investments following a tariff cut.

2.1.2 Competition shocks and firm strategies

In response to higher competition following a tariff cut, firms focus on generating cash flows and lower their costs even at the costs of long-term growth (Salter, 2012); firms significantly decrease R&D and capital investment and increase cash holdings (Frésard and Valta, 2013). Firms attempt to cut any expenses that are not relevant for short-term survival or to sell off underperforming divisions or assets (Dasgupta et al., 2017). Following a tariff cut, firms fight for their survival, and the ability to lower expenses and improve efficiency is the desirable skill for CEOs.

Firms must strike a balance out between short-term performance and long-term growth (Gryglewicz et al., 2018). Firms that focus too much on one and neglect the other are likely to lose competitive advantage in either short- or long-term (Olesiński et al., 2014). For instance, a firm may sacrifice its long-term growth by lowering its capital expenditure and R&D to boost its earnings in the short-term. Similarly, a firm may focus on long-term outcomes so much so that it fails to create short-term earnings necessary for its survival.

Increases of import tariffs protect domestic firms from higher foreign competition. Because firms need not worry about their survival, they take advantage of this short window of opportunity and focus more on long-term growth. Following a tariff increase, firms restructure their business and invest heavily in updating technology and infrastructure (Mergent, 2005). Specifically, firms choose to substantially increase R&D investment to improve their competitiveness in the future (Hombert and Matray, 2018). Conditions following tariff increases warrant a CEO with the set of skills required for low competition, and high growth opportunities. Overall, tariff cuts or increases significantly change industry conditions and, consequently, the skill set required to improve firm performance.

2.2 CEO-Firm matches

In addition to monitoring and advising, CEO assessment is another important role of the boards. Hermalin and Weisbach (2014) note that boards constantly assess CEO qualities and whether the CEO is a good match for the firm. The board learns about the CEO's qualities through either hard information (e.g., accounting measures of performance) or soft information (e.g., problem solving skills, leadership skills), and compares them to the firm's needs (Cornelli et al., 2013). Firm performance is an example of hard information that has frequently been studied. CEO turnover is more likely when performance is poor (Weisbach, 1988). An example of soft information is whether the CEO has the skill set and experience to successfully run the firm in current conditions. Here, I discuss the theoretical foundations as to how firms hire or fire CEOs.

The literature on firms' hiring decisions can be roughly divided into two main groups of theoretical models: asymmetric information models and learning models.[2] In the asymmetric information models, employees know their own abilities and skills but firm do not. Given that there is no information asymmetric in my empirical setting, the predictions of these models are not applicable here. In the learning models, which are pertinent to the present paper, firms and employees learn about employees' productivity together and there is no information asymmetric. Therefore, the goal of these models is to find an efficient matching.

Learning models can be classified into two groups. In the first group, while CEOs can have different skills or talents, the expected productivity of a CEO does not depend on the firm for which she works. In other words, CEOs possess a general ability that is valued equally by all firms. These models are often used to explain different CEO pay as well as the upward trend in CEO compensation. Rosen (1981) finds that more talented executives should make more money and work for larger firms, which leads to a concentration of income in top executives. In the spirit of Rosen (1981), Gabaix and Landier (2008) propose a calibratable equilibrium model of CEO-firm matches and use extreme value theorem to explain the increase in CEO pay in recent years. Tervio (2008) develops a competitive assignment model with the unique feature–an exogenous firm-specific characteristic causes variation in firm size–and finds that

[2]see Lazear and Oyer (2007) for a review of matching models.

CEO pay can be mostly explained by variation in firm size and that CEO ability has relatively small effects on firm value. Incorporating risk aversion into a competitive assignment model, Edmans et al. (2007) develop a model of both the level and sensitivity of CEO pay. All these models assume executives' ability is one dimensional and transferable across firms, which is not simply true in the real world. The empirical implication of these models is that firms must hire the most talented CEO they can afford and need not constantly monitor the quality of CEO-firm match when conditions change.

In the second group, however, the productivity of a CEO varies across firms and depends on characteristics of the firm for which she works. The early studies include Jovanovic (1979b) and Jovanovic (1979a) that assume workers have different productivity and firms have different productivity needs. In other words, "there are no "good" workers and "good" employers, but only good matches." This lends credence to the notion of match-specific productivity.[3] The present paper takes the same viewpoint and assumes productivity depends on the quality of CEO-firm matches. Oyer and Schaefer (2010) discuss the possible sources of match-specific productivity: executives' preferences (Prendergast, 2007), coworker complementarity (Van den Steen, 2005; Hayes et al., 2006), complementary relations between firm and executive characteristics (Andersson et al., 2009; Woodcock, 2015; Pan, 2015; Jung and Subramanian, 2017), and firm-specific skill weights (Lazear, 2009).

The dependency of productivity on CEO characteristics provides firms with some guidance on choosing the right CEO. For instance, Prendergast (2007) puts forth a model in which bureaucrats exert effort because of intrinsic, rather than monetary, incentives. This form of motivation is resulted from bias in favor of their principals (e.g., policemen) or in favor of their clients (e.g., teachers, firemen). One possible outcome of this model is bifurcated selection, in the sense that "it becomes composed of those who are most preferred by the principal, and those who are least preferred." The results show that firms benefit from hiring a CEO with strong beliefs, and people with similar belief systems are more likely to join the firm.

[3]Note that implications of the job-matching hypothesis are also consistent with the firm-specific human capital hypothesis (Lazear and Oyer, 2007). The difference is that under the hypothesis of job-matching, the quality of the firm-employee match is fixed at the time of hiring and revealed afterward, whereas the firm-specific human capital hypothesis argues that the quality of the match becomes better over time.

Similarly, Van den Steen (2005) proposes a model in which employees develop and get rents from a successful new project. However, the CEO decides whether to implement the project or not. Managers with stronger beliefs increase firms' expected profits because employees who agree with these managers get easier approval for implementation of the project and exert more effort. This leads to the sorting effect: employees with beliefs similar to the manager are more likely to get hired or stay in the firm. The implication of this model is that the probability of turnover for top executives is higher after a CEO turnover. Hayes et al. (2006) find empirical support for this. The authors also find that the magnitude of the increase in the probability of non-CEO turnover is affected by how long the CEO and managers have worked together. They attribute these findings to complementarities between the skills of CEOs and those of top executives.

The idea of matching the CEO to the product market conditions was further supported by Andersson et al. (2009), where they develop a model to study the relationship between hiring strategies and characteristics of product markets. Firms operating in industries with high upside payoffs gain more from hiring innovative employees. Using data in the software industry where innovation is tied to employees' talent, and returns are skewed, they find that firms pay higher starting salaries and offer higher compensation growth. Woodcock (2015) empirically disentangles effects of CEO skills, from those of firm characteristics, and those of match-specific productivity on wage distribution. The author finds that a considerable portion of earnings can be explained by match effects, which exposes the shortcomings of previous studies that overestimate the effects of CEO experience and underestimate the match effects.

The models so far have considered only the firm's side of the matching and ignore the CEO's role. However, Pan (2015) proposes a two-sided matching model in which firms and CEOs choose each other simultaneously. Using this multi-dimensional competitive assignment model, the author finds that complementaries between CEO and firm characteristics increase productivity. The three documented complementaries are firm size and CEO talent, firm diversification and general managerial skills, and firms' R&D and CEO innovativeness. Similarly, Jung and Subramanian (2017) develop a multi-dimensional competitive assignment model by adding industry effects to Gabaix and Landier (2008)'s model and study

the previously unexplored product market effects on CEO compensation. The CEO effect is measured as the change in the size of the median firm if the best CEO in the industry were to run the firm. The large estimated CEO effect can be attributed more to industry characteristics (e.g., the product substitutability) than to CEO skills. They find that CEO skills are more important in competitive industries with higher product substitutability.

Finally, Lazear (2009) offers a new view of firm-specific human capital: skills are general in the sense that they are not idiosyncratic to a particular firm, but firms put different weights on different skills. Overall, the prediction of the second group of learning models is that because the quality of CEO-firm matches affects firm productivity, a firm must constantly monitor the CEO-firm match and take necessary actions to improve it when conditions change sufficiently. Similar to this view, the present paper assumes that skills relevant to high- or low-competition environments are general skills and transferable across firms and industries, that firms put more weights on the most relevant skills after a competition shock, and that firms and CEOs choose each other simultaneously: the CEO may leave the firms if she is not comfortable working in the new environment or has a better outside opportunity.

2.2.1 Tariff shocks and CEO turnover

The role of industry conditions in CEO turnover has recently received growing attention in finance literature (Eisfeldt and Kuhnen, 2013). Industry conditions change over time and, consequently, lead to a need for new management styles. CEOs have heterogenous skill sets that are suitable for certain conditions. To perform better in new conditions, firms may need to hire CEOs with desirable skill sets. Only when the benefits of having the appropriate management style outweigh the costs of turnover, do firms decide to fire the incumbent CEO and hire a new one with the desirable skill set. This implies that some firms efficiently keep their CEOs, even if the CEO lacks the ideal skill set.

Guay et al. (2013) find empirical evidence of management style-driven turnovers. They argue that after a shock to industry conditions, the desirable management style changes and that not all CEOs can adapt to industry conditions. They find that shocks to industry investment, sales, competition and globalization lead to a higher probability of CEO turnover.

Dasgupta et al. (2017) use tariff cuts as exogenous competition shocks and provide evidence that firms with poor governance are more likely to experience CEO turnover after competition shocks. They note that CEOs cannot acquire the required skill sets quickly enough, and those who lack the skills are forced out. In sum, firms might strategically replace their CEOs in response to a need for new skills induced by a change in industry or firm conditions.

The nature of any industry changes following major tariff changes. For example, following a tariff increase, managers need to have experience and skills to initiate and pick a promising R&D project, whereas after a tariff cut, they need experiences that are required to differentiate their products, cut unnecessary costs and deal with high competition (Thietart and Vivas, 1984). If the board believes the CEO cannot deliver the strategies suitable for the current competition level, the board fires the CEO and hires someone who can implement the strategies. It is also possible that the CEOs prefer to work in conditions where they have relevant skill sets and are comfortable running the firm. This discussion leads to the first hypothesis:

Hypothesis 1. *The probability of CEO turnover increases for firms in an industry that experiences a tariff cut or tariff increase*

After a change in import tariffs, firms need to adapt quickly to the new environment. Given that it takes years for executives to develop skill sets, firms might not survive after a major tariff change in time for their CEOs to learn the desirable skill sets. CEOs' adaptability and abilities can be predicted based on their experiences. A CEO who has worked in conditions similar to the firm's current condition is more likely to have developed the required skills. By looking at the CEO's career, we can observe conditions in which the CEO has worked. If the firm's current competition level is similar to one of those conditions, we can expect the CEO to be a better fit than someone who has never experienced this condition before.

Following a major tariff change, the board assesses the CEO's abilities to run the firm in new conditions (Hermalin and Weisbach, 2014). If the board believes that the incumbent CEO does not have the desired skill set, it will hire a new CEO with relevant experience.

For instance, assume a firm wants to improve efficiency and reduce costs and the board believes that the CEO cannot successfully deliver suitable strategies, so the board wants to hire a new CEO with the desirable skill set. A candidate who has successfully worked in a highly competitive industry is more likely to have acquired the skills suitable to cutting unnecessary costs than a candidate who has worked only in a low competitive industry with high investment opportunities. Note that the underlying assumption is that the CEO has successfully worked in those environments. This assumption is reasonable because we can assume that the board picks someone to run the firm only if she has been successful in her previous jobs.

Hypothesis 2. *The probability of turnover after a competition shock is lower for CEOs who have relevant competition experience.*

CEOs have certain skills and abilities that firms take into account in their hiring and firing decisions (Eisfeldt and Kuhnen, 2013). For instance, CEOs with marketing backgrounds are a better match for firms that emphasize R&D, product differentiation, and organic growth (Srinivasan and Parrino, 2010). Steve Jobs, a co-founder and then the CEO of Apple, was replaced by John Sculley in 1983. Before joining Apple, Sculley was the CEO of PepsiCo and was able to deliver a fivefold increase in Pepsi market shares because of his unique marketing skills (Datta et al., 2002). The board decided that Sculley, an industry outsider, was a better fit than Jobs to run Apple in the growth stage when Apple specifically needed to focus on long-term growth and to target new customers. Hiring an industry outsider is not unique to Apple. In 1993, Kodak was a low-growth firm that was struggling financially because of its inability to exploit and adapt to the shift from traditional to digital photography. Kodak hired George Fisher, who had launched many new digital products at Motorola in the late 1980s. Fisher was able to reinvigorate Kodak by focusing on growth opportunities in digital markets. The aforementioned CEO turnovers are evidence that a seemingly positive change in industry conditions that is considered good news, in the long run, induces a need for a new management style and that if the CEO cannot deliver the new style, CEO turnover is likely.

2.3 Alternative responses to tariff shocks

Product market competition affects firm future cash flows, profits, and the probability of bankruptcy. Firms' responses to competition shocks can vary considerably depending on firm conditions, industry characteristics, the pool of potential CEO candidates, and, more importantly, costs associated with those responses; a firm may hire a new CEO with relevant skills to deliver desired strategies, only if there are hirable CEO candidates with suitable skill sets, and the costs of CEO turnover are outweighed by its benefits. However, firms may not be able to find a candidate whose competitive skill set is sufficiently and meaningfully better than that of the incumbent to justify the costs of turnover or may not have the means (e.g., the ability to offer an enticing contract) to attract a potential candidate or necessary resources (e.g., financial) to implement the desired strategies once the candidate is hired. In this case, firms avoid the high costs of CEO turnover and opt for an alternative way to react to competition shocks. Alternative responses include but not limited to changing firm structure, adding new top management or a board member with a relevant skill set, and entering a new industry. But the most researched and most probable response is changing CEO compensation plans.

2.3.1 Tariff shocks and CEO Compensation

Altering managerial compensation has been proposed as a viable response to changes in firm conditions. Grossman and Hart (1980) argue that a considerable change in a firm's environment may give managers the opportunity to take self-serving actions that harm shareholders' value. That is, the compensation scheme that has initially governed the manager-shareholder relationship and limited managerial slack may not do so following a shock to the firm's environment. Compared to hiring a new CEO, changing executive pay schemes may be a cheaper, albeit less effective way to attempt to implement strategies suitable to new conditions. In this section, I discuss the theoretical predictions of and empirical findings on the effects of product market competition on CEO compensation plan.

Theoretical papers examine the role of product market competition in managerial com-

pensation through three different channels: the information structure of the incentive scheme, firm profits (return to effort), and the probability of liquidation. Overall, theoretical findings suggest that competition could have significant and, sometimes, contradicting effects on agency problems.

First, information asymmetry between shareholders and managers is a source of contractual inefficiency. Competition changes the information structure of agency problems and generates useful information that is not available to shareholders in a monopolistic setting, allowing shareholders to more accurately infer the CEO's choice of effort or skills. Hart (1983) proposes a hidden information model and argues that competition is a source of discipline. In his model, price competition reveals information about common shocks to production costs that otherwise hide the CEO's effort choice, alleviating managerial slack. In that sense, competition aligns the manager's interests with those of shareholders and reduces the need to use compensation schemes to encourage the manager to put more effort.

Scharfstein (1988) shows that the findings of Hart (1983) are susceptible to the choice of CEOs' utility functions and that competition may, in fact, exacerbate agency problems. This inefficiency is due to the fact that managers have an incentive to under-report their productivity, forcing firms to offer larger rewards to induce more effort. Higher competition makes it easier for managers to hide their lack of effort and exacerbates the incentive problem, making it more expensive for firms to incentivize their CEO. Complementary to Scharfstein (1988)'s hidden information model, Hermalin (1992) develops a hidden action model and argues that an increase in competition may lower the difference in expected payoffs of the CEO's actions and lead to less managerial effort. Following a tariff cut, firms experience a significant decrease in their sales, cash flows, and stock price. In these conditions, lower outputs cannot be blamed only on the CEO's incompetence or lack of effort, making it harder for firms to infer the quality of CEO-firm matches and, consequently, to find an optimal CEO compensation plan. Overall, the findings of these papers suggest that the net informational effect of product market competition on managerial compensation schemes is ambiguous and depending on which channel dominates, the net effect could be either positive or negative.

Second, Hermalin (1992) break downs the effects of product market competition on managerial effort (effects other than informational effects) into three: income, risk-adjustment,

and the relative expected value of actions. In his framework, all three channels can have both positive and negative effects on managerial effort. However, under the assumption that agency goods are normal, the income effect dominates the other two and leads to more CEO effort. In this model, the shareholders sell agency goods to the CEO in exchange for a portion of the CEO's future income. Higher competition leads to lower expected revenue for firms and, consequently, lower expected payoffs for CEOs. Put differently, an increase in competition forces CEOs to buy fewer agency goods (i.e., exert more effort).

Raith (2003) takes a different approach and relaxes the exogeneity of market structure to allow competition and compensation schemes to be determined as part of the market equilibrium. In this framework, competition has two contracting effects: "business stealing effect" and "scale effect." On the one hand, an increase in competition flattens demand functions (more elastics), so a decrease in prices attracts more customers and increases the marginal benefit of cost-cutting strategies, which is called "business stealing effect." On the other hand, in a competitive market where rivals offer low prices, a firm gains smaller benefits from lowering its costs ("scale effect"). In the exogenous market structure setting, the net effect is ambiguous; however, relaxing this assumption unambiguously leads to a greater incentive for managers to exert effort. The reason is that some unprofitable firms leave the market, resulting in higher outputs for the remainders and, therefore, stronger managerial incentives. In other words, "scale effect" does not exist in an industry with endogenous entry and exit of firms. In contrast to the assumption in Raith (2003)'s model, higher competition after a tariff cut is caused by an exogenous shock from outside the market and not from within. Even though some less profitable firms leave the industry after a tariff cut, the available higher demand may be absorbed only by foreign firms whose products are close substitutes to those of the departing firms. Overall, the net effect of this channel on CEO compensation is ambiguous: if the "scale effect" dominates, competition has a negative effect on CEO compensation, while if the "business stealing effect" dominates, competition has a positive effect on compensation plan.

Third, Schmidt (1997) examines the role of competition in agency problems through its effects on the probability of liquidation. In his model, higher competition has two opposite effects. First, competition lowers firm profits and, consequently, increases the probability

of liquidation, which unambiguously induce the CEO to exert more effort. Second, the decrease in profits reduces return to effort and leads less managerial effort. So, the net effect of competition on the optimal incentive scheme is ambiguous. In other words, the liquidation effect does not always lead to more managerial effort.

While theoretical models have mixed predictions about the role of competition in CEO compensation, empirical results provide weak evidence that competition forces firms to be more efficient and reduces managerial slack. Cuñat and Guadalupe (2009) use deregulation in the banking and financial industries as exogenous competition shocks and find that following a deregulation episode, firms lower fixed pay and increase variable pay and performance-for-pay sensitivities. In another paper, Cuñat and Guadalupe (2009) find that globalization reduces fixed pay, but increases the sensitivity of pay-for-performance. Lie and Yang (2018) find that higher Chinese import penetration leads to lower total compensation, and stock compensation, but higher option grants.

It is of paramount importance to account for other factors that affect executive compensation when studying the role of competition in managerial compensation. Bebchuk et al. (2002) argue that CEO bargaining power and rent extracting can explain a significant portion of managerial compensation as well as a fair number of puzzles in managerial compensation that cannot be justified by optimal contracting models. For instance, Blanchard et al. (1994) show that managers usually receive extra cash compensation following a cash windfall from winning or settling lawsuits, even though they have played no major role in winning lawsuits. In addition to rent extracting, the desire to camouflage–"attempts to hide, obscure, and justify various aspects of compensation in order to reduce outrage"–may be the reason for inefficiencies in compensation scheme; risk-averse managers are expected to ask for higher fixed compensation, however, rent extraction is camouflaged through excessive option grants. Bertrand and Mullainathan (2001) examine the notion of "pay for luck" and find that managers are equally rewarded for improved performance that is beyond their control.

In addition, to the extent that higher competition causes financial difficulties (e.g., higher likelihood of bankruptcy, financial constraints), many of the arguments about managerial incentives when firms are struggling financially are valid for compensation schemes following

an increase in competition.[4] Gilson and Vetsuypens (1993) examine managerial compensation for financially distressed firms (i.e., firms that either filed for Chapter 11 or restructured their debt). They find that total pay for newly appointed CEOs is higher (lower) for an outside replacement (inside replacement) and that CEOs are disproportionately granted more options during the financial distress period. Ellis (2011) studies compensation schemes of turnaround specialist CEOs and find that turnaround CEOs are paid higher total compensation, cash, and equity incentives. He argues that the findings are consistent with the notion that turnaround CEOs have special skill sets and bear higher risks by joining a distressed firm.

Moreover, higher equity-based compensation is consistent with the noisier monitoring environment during a distress period, when the real reason for the firm's failure cannot be simply blamed on the CEO's mismanagement. Chowdhury et al. (2014) proposes a model to examine the role of financial constraints in executive compensation and argues that financially constrained firms encourage their CEO to exert more effort with higher compensation so that the higher effort makes up for the reduction of output due to financial constraints. Finally, Chang et al. (2016) examine how higher financial risk affects managerial incentives and find that while cash and bonus compensation is lower, equity-based compensation is significantly higher, resulting in higher total pay for CEOs hired when financial risk is high. They attribute this compensation premium to bearing higher risk of distress.

Overall, despite weak empirical evidence of positive effects of product market competition on managerial incentives, theoretical predictions are ambiguous at best. Given that managers can improve performance through either exerting more effort or having better-suited skills, the implication and predictions of theoretical models about rewarding managerial effort are applicable to rewarding managerial skills (Cuñat and Guadalupe, 2009).

[4]Note that pertinent to this study are managerial incentives granted to CEOs who are not responsible for financial problems with which their firm is dealing either because they are newly hired or because the cause of financial distress is outside the CEO's control.

3.0 Data Description and Methodology

To construct my sample, I manually match EXECUCOMP to BOARDEX to find the employment histories of CEOs and CEO characteristics. I exclude those CEOs who have been in office for fewer than two years to make sure there are no interim CEOs in the data set (Eisfeldt and Kuhnen, 2013). Then, I merge this data set with the firm-level accounting and financial data from Compustat and the stock-level data from the Center for Research in Security Prices (CRSP). I obtain the governance data from Institutional Shareholder Service (ISS) (formerly called Investor Responsibility Research Center (IRRC)) and the institutional investors' holdings from Thomson Reuters. I restrict my sample to manufacturing firms (2000-3999 SIC codes) because of the availability of tariff data. I also exclude firm-year observations with negative sales and assets and observations for which tariff data are not available.

The definition of all the variables is provided in the Appendix. My final sample includes 7,007 firm-year observations, 1,725 unique CEOs, and 939 unique firms between 1992 and 2005. Table 1 presents descriptive statistics. On average, CEOs are 55 years old and have a tenure of seven years, which is comparable to previous findings (Dittmar and Duchin, 2015).

3.1 Reductions and increases of import tariff rates

Tariffs are typically politically motivated and decided during bilateral or multilateral trade negotiations (Krugman et al., 2012). Thus, they are perceived to be exogenous to a firm's policy (Frésard and Valta, 2013) and cannot be predicted by industry or market conditions (Dasgupta et al., 2017; Xu, 2012). There are two arguments against the exogeneity of increases in import tariffs. First, firms might lobby for higher tariffs to protect themselves from foreign competition. This argument is more relevant for corporate decisions such as investment, capital structure, or M&A from which CEOs may benefit. It is improbable that CEOs lobby for higher tariffs that would lead to their departure or that firms lobby for

changes in tariffs to subsequently fire their CEOs. In addition, firms that have moved parts of their production offshore are against any tariff increase. These firms tend to be larger and more powerful than an average firm in the industry. Overall, it is highly unlikely that this channel affects my results.

The second argument is that tariffs are set based on industry conditions. For instance, a country might impose tariffs to protect its poor-performing manufacturers. Put differently, industry conditions (e.g., low profitability) lead to tariff increases as well as CEO turnover. To rule out this possibility, I compare characteristics of industries that experience a tariff increase to those of industries that experience a tariff cut. Table 2 shows the three-year average of the main industry variables before tariff changes. Industries that subsequently experience tariff cuts are similar in size, return on assets, sales, and return on equity to those that experience tariff increases. These two groups of industries appear to be different in only R&D, and Tobin's Q. Industries with lower R&D, and Tobin's Q seem to be more likely to experience tariff increases. But industries are vastly different in nature, specifically in growth opportunities and cost structures. To account for these differences, I regress the main variables on industry fixed effects and compare the residuals for these two groups (Panel B of Table 2). After controlling for the differences in the industry average, industries that experience tariff cuts are similar to those that experience tariff increases. That is, tariff changes cannot be foreshadowed solely by industry conditions.

Import tariffs are one of the main components of trade costs (Frésard and Valta, 2013). Much has been said about how major tariff cuts alter firms' long-term and short-term strategies (Valta, 2012; Frésard, 2010). Major tariff increases, too, drastically change how firms operate. For instance, the U.S. imposed 21% tariffs on softwood lumber imports from Canada in 2018. Lumber businesses say that they do not need to worry about cheap imports and have the confidence to invest. One of such businesses is Westervelt that invest $190 million to build a more efficient plant for producing high-margin products.[1] Both tariff cuts and increases significantly alter industry conditions.

I follow Valta (2012) and Frésard (2010) and measure changes of import tariffs using

[1]Joe Pattion, a vice president of Westervelt, said "The trade case gave us the hope to invest." (Eavis, 2019)

product-level import data gathered by Feenstra (1996), Feenstra et al. (2002), and Schott (2010) for my sample period, 1992-2005. Then, I measure changes of import tariffs at the industry level (3 digit SIC codes) by dividing the ad valorem tariff rate by the Free-On-Board custom value of imports. For each industry-year, I classify a tariff change as a significant tariff increase (reduction) if the positive (negative) change in the tariff is three times larger than the median of industry's positive (negative) change.

For tariff changes to be meaningful, I exclude instances where the change in the tariff rate is smaller than 1%, and tariff changes that are followed or preceded within the next three years, by comparably large opposite or similar changes. I identify 57 major tariff cuts and 27 major tariff increases between 1992 and 2005 (Table 4).

3.2 CEO turnover

I begin by merging manufacturing firms (2000-3999 SIC codes) from COMPUSTAT to EXECUCOMP dataset to get the name and compensation of the CEOs of 1,725 publicly traded manufacturing companies from 1992 to 2005. To identify CEO departures using Execucomp, I follow Eisfeldt and Kuhnen (2013) and use the CEOAN variable that takes the value of "CEO." I require that a CEO stays in that position at least for two years to exclude interim CEOs. If the EXECID variable that is a manager identifier changes between year t and year t+1, I record a CEO departure in year t. I classify CEO departures using news search and classifications generously shared by Jenter and Kanaan (2015) and Eisfeldt and Kuhnen (2013). Based on news stories around CEO departures, turnovers are classified into planned-retirements, unclassified, and forced departures. A departure is classified as planned-retirement if it was announced six months ahead of time or caused by a health-related issue. If news articles use words such as "fired," "policy differences," "pressure," or "forced out" to describe a departure, the departure is labeled as forced. All other departures are named unclassified, such as unexpected retirements, departures for unspecified reasons, or the acceptance of a job at another firm. To account for the possibility that a CEO may leave voluntarily following a major change in industry conditions, I include both forced turnovers

and unclassified turnovers if CEOs are younger than 65 years old, an average retirement age, at the time. Total turnover in my sample is 786 (11.2%), which is comparable to the findings of prior literature (Kaplan et al., 2012; Eisfeldt and Kuhnen, 2013) (Table 4). At 11.2%, the estimated average tenure is 8.9 years. I find that of all 786 CEO departures, 139 (17.7%) departures are instances where either CEOs were forced out, or CEOs were younger than 65 and left voluntarily.

3.3 Measuring CEOs' long-term and short-term skills

Boards compare the conditions and challenges of a CEO candidate's experience with the firm's needs in evaluating the suitability of the candidate. This can be seen in the most recent turnover at DuPont. On October 5th, 2015, Dupont replaced CEO, Ellen Kullman, after three years in the role with Edward Breen, an outsider and former CEO of Tyco International. DuPont was struggling financially and needed a CEO who could improve its short-term performance, so they hired Breen the "breakup expert" who acquired flawless cost-cutting skills. Breen split General Instrument Corp into three independent firms, one of which was later acquired by Motorola.[2] He then moved to Tyco International where he served as a CEO and chairman from 2002 to 2012 and led the restructuring and breakup of Tyco through multiple spin-offs.[3] Breen split Dupont into three stand-alone firms and is a good example of CEOs who have developed cost-cutting skills through years of experience in turning firms around and focusing on short-term performance.

Through their prior experiences, managers are believed to have developed specific skills and abilities and to be successful if their skills match their firms' condition. In this paper, I explore skills relevant to short-term (i.e. high-competition) and long-term (i.e. low-competition) goals (Figure 1). Entrepreneurs tend to have abilities and skills that focus mostly on long-term growth and new investment opportunities, and less on day-to-day op-

[2]https://www.delawareonline.com/story/money/business/2015/10/07/dupont-breaks-tradition-outsider/73508328/

[3]http://www.dow-dupont.com/news-and-media/press-release-details/2018/DowDuPont-Announces-Senior-Leaders-of-the-Future-Independent-Companies-Corteva-Agriscience-and-DuPont/default.aspx

eration. On the other side of the spectrum, turn-around specialists only focus on short-term performance with little regard for long-term growth. These CEOs tend to have better cost-cutting skills and to be experts in running a tight ship (Ellis, 2011). These two skills are considered and measured separately and individually (two-dimensional rather than one), allowing the possibility that a CEO could have both high-competition and low-competition skills.

To disentangle firm effects from CEO effects, I consider CEOs' experiences in firms other than their current firms (Dittmar and Duchin, 2015). I generate two indices of the high-competition skill and the low-competition skill based on the conditions in which a CEO had worked prior to her current CEO position. To do this, I first consider six proxies for high-competition skills (Dasgupta et al., 2017) and three proxies for low-competition skills (Mergent Industry survey, 2004).[4]

high-competition skill proxies are:

- Tariff Cut Dummy (S1): Whether a CEO has worked in a firm that experiences a tariff cut. A CEO who experienced a tariff cut before is likely to have developed the skill set suitable to work in competitive conditions.
- Sales shock (S2): Whether a CEO has worked in a firm that experienced a negative sales shock. Firms' sales drop after a tariff cut. A CEO with a negative-sales-shock experience is likely to handle or manage the firm better after a tariff cut.
- Competition (S3): Whether a CEO has worked in highly competitive industries. Because firms face higher competition after a tariff cut, a CEO who worked in competitive industries has probably acquired cost-cutting skills.
- Asset sales (S4): Whether a CEO has engaged in asset sales. To increase productivity, firms tend to sell off their less efficient assets and divisions following a tariff cut.
- Low-cost structure: Whether a CEO has worked in a low-cost structure firm. For one unit of sales, efficiently run firms tend to have lower costs of goods sold (S5) and selling, general and administrative expenses (S6).

[4]To fully capture changes in industry conditions, one needs to consider changes in all the dimensions and aspects of an industry, which is not practical. The set of proxies needs to be sufficient and not exhaustive or complete. As long as, an aspect of the industry is correlated to one of the proxies, its effects are reflected on and captured in the index.

low-competition skill proxies are:

- Tariff Increase Dummy (L1): Whether a CEO has worked in a firm that experienced a tariff increase. A CEO who experienced a tariff increase before is likely to have developed the skill set suitable for restructuring and updating infrastructure.
- R&D (L2): A CEO who was involved in a firm that invests heavily in R&D has probably developed skills desirable for innovation and long-term strategies.
- Tobin' Q (L3): a CEO who worked in a firm with high Tobin's Q is likely to have attained a long-term view and skills.

To construct indices for low-competition and high-competition skills, I take several steps. First, all firms are divided into quantiles based on each of the proxies listed above (except tariff dummies). Then, for every CEO and proxy, the average rank of the firms that a CEO had worked over the ten years prior to joining their current firms is calculated. It is possible that a CEO switches between firms or industries following an unfavorable change in firm or industry conditions. To control for this possibility and partially ensure the assumption that CEOs have worked successfully in their prior positions, I include firm-year ranks at time t in the calculation only if a CEO stayed with the firm or the industry for at least another two years ($t + 2$). To illustrate the methodology, consider CEO A's and CEO B's career histories for the R&D proxy. Note that CEO A switches to a new firm in year seven after the firm's R&D index drops, implying that CEO A prefers to work in a firm with high R&D. The average ranks for CEO A and CEO B are 4.25 and 2, respectively. CEO A has a higher R&D proxy than CEO B, implying that CEO A is more likely than CEO B to have developed low-competition skills.

	Year	1	2	3	4	5	6	7	8	9	10
CEO A	Firm Change	0	0	0	0	0	0	1	0	0	0
	Rank	3	4	5	4	5	2	2	5	4	4
CEO B	Firm Change	0	0	0	0	0	0	0	0	0	0
	Rank	3	3	2	2	1	3	2	2	1	1

$$CEO\ A's\ R\&D\ Proxy = \frac{(3+4+5+4+5+0+0+5+4+4)}{8} = 4.25$$

$$CEO\ B's\ R\&D\ Proxy = \frac{(3+3+2+2+1+3+2+2+1+1)}{10} = 2$$

For every CEO, I follow the same procedure for each proxy and then use principal component analyses to combine each set of proxies into a one-dimensional index of low-competition and high-competition skills. Table 5 shows the results. Eigenvalues for high-competition and low-competition indices are 2.826 and 1.4, suggesting that these indices have higher explanatory power than any of the proxies by itself. All variables are loaded as expected. Asset sales have negative loadings, implying that in competitive conditions, firms are more likely to sell their underperforming assets. For CEO i in year t, high- and low-competition indices are calculated by multiplying the scores in Table 5 by the proxies that are standardized to have zero mean and a standard deviation of one. A higher high-competition index associates with better cost-cutting skills, and better low-competition skills are reflected by a higher low-competition index. In every industry-year (3-digit SIC codes), CEOs whose indices are in the top quartile are considered CEOs with the relevant skills.

$$\begin{aligned}\text{High-Competition Index}_{lt} = {} & 0.042 \times \text{Tariff Cut}_{lt} + 0.483 \times \text{Sales Change}_{lt} \\ & - 0.138 \times \text{Asset Sales}_{lt} + 0.097 \times \text{Competition}_{lt} \\ & + 0.579 \times \text{COGS}_{lt} + 0.634 \times \text{XSGA}_{lt}\end{aligned}$$

$$\text{Low-Competition Index}_{lt} = 0.017 \times \text{Tariff Increase}_{lt} + 0.707 \times \text{R\&D}_{lt} - 0.707 \times \text{Tobin}_{lt}$$

I find significant variation across CEOs in terms of both low-competition and high-competition skills (Figure 2A). Even CEOs with comparable skills in one dimension (e.g., low-competition) appear to have a wide range of abilities in the other dimension (e.g., high-competition). Another pattern that emerges from the graph is that CEOs with higher low-competition (high-competition) skills appear to have lower high-competition (low-competition) skills, implying that CEOs may have a preference for one or the other. An example of a CEO

with high-competition skills is Chadwick Deaton, who was named the CEO of Baker Hughes in 2004 to revive the firm. Baker Hughes, a GE company, is an oil field service company and has to emphasize mostly on efficiency and productivity. The head of the search for a new CEO emphasized on Deaton's "outstanding managerial and operating knowledge." On the other side of the spectrum (low-competition skills) is Prakash Agarwal, who co-founded Neomagic Crop and has served as a CEO, president, and director. He was awarded the 1998 Ernst & Young "Entrepreneur of the Year Award" for distinction in innovation and entrepreneurship. Neomagic went public in 1997 to become one of the fastest rising semiconductor firms. Regarding GE's recent turnover, the CEO of Dupont, Ed Breen, seems to have more cost-cutting skills than the newly appointed CEO of GE, Larry Culp. Overall, CEOs seem to have a wide range of both low-competition and high-competition skills.

Figure 2B and C show how CEOs' skills change over time during my sample period. The demand for high-competition skill CEOs was higher in the 1990s and steadily went down around 2000. The higher demand for high-competition skills is concurrent with the commencement of The North American Free Trade Agreement (NAFTA) in 1994 and The World Trade Organization (WTO) in 1995. Canada, Mexico, and the United States came into the agreement to substantially lower or eliminate trade and investment barriers among these three countries. WTO was signed by 124 countries and replaced the General Agreement on Tariffs and Trade (GATT) through many multilateral agreements. Both agreements considerably lower trade costs for foreign manufacturers and intensify competition for domestic firms. Firms were forced to focus on their short-term performance by improving efficiency. The reversal of some of the tariff reductions and the shift to the information age in the late 90s provided firms with ample investment opportunities. Firms attempted to exploit these opportunities by updating their infrastructure and prioritizing long-term growth. As a result, there was a shift in CEOs with low-competition skills.

CEOs with low-competition skills seem to have different characteristics than those with high-competition skills. They appear to stay in firms for a shorter period, switch between firms more frequently and between industries less frequently, work for conglomerate less often, and found a company (Panel A of Table 7). CEOs with high-competition skills tend to work for larger firms and in a more competitive environment, to receive higher compensation

in terms of salary and cash (Panel B and C of Table 7).

4.0 Results and Methodology

4.1 CEO turnover and tariff shocks

Unanticipated tariff changes provide a quasi-natural experiment setting to examine the role of the competitive environment in CEO turnover. Tariff changes happen at different times across industries. I will exploit these differences in timing and estimate the following difference-in-difference specification:

$$\text{Turnover}_{ijt} = \alpha \times CUT_{jt} + \beta \times INCREASE_{jt} + \eta \times X_{ijt-1} + \theta_t + \mu_i + \epsilon_{ijt} \tag{4.1}$$

Where i indexes firm, j indexes industry, and t indexes time. $Turnover_{ijt}$ is a dummy variable that is equal to 1 if either the CEO is forced out or the CEO who is younger than 65 years leaves for unspecified reasons and 0 otherwise. The variables of interest are CUT_{jt} and $INCREASE_{jt}$ that are indicator variables take the value of 1 in the first three years after an industry-level tariff cut and increase respectively have become effective. θ_t and μ_i are year and firm fixed effects, respectively. Firm fixed effects control for unobservable time-invariant differences among firms. X_{ijt} includes industry-adjusted return on assets, industry-adjusted buy and hold return, changes in sales, Tobin's Q, volatility, competition, institutional ownership, CEO characteristics (age, tenure), and governance characteristics (board size, board independence, G index from Gompers et al. (2003). The error terms are clustered at the industry level.

Table 8 presents the results for Hypothesis 1 (Equation 4.1). Column 1 shows that both CUT and $INCREASE$ are statistically significant and comparable in magnitude. Column 2 shows that the results remain significant after adding control variables used in prior literature (Dasgupta et al., 2017; Jenter and Kanaan, 2015). I add governance control variables in Column 3. In Column 4-6, the event years (the year that a tariff change occurs) are excluded. To address the concerns that industries that experience a tariff change are

systematically different from others, I add industry-year fixed effects where industries are defined by 2-digit SIC codes (Column 7-9); the control group consists of firms in the same 2-digit SIC codes that do not experience a tariff change. The results stay significant in all settings.

The effects of tariff cuts and increases are economically meaningful. The probability of CEO turnover increases by 4.5 percentage points in the first three years following a tariff cut. Consistent with the findings of Dasgupta et al. (2017), the likelihood of CEO turnover more than double after a tariff cut. Moreover, I find the effects of tariff increases on CEO turnover are as large as those of tariff cuts; the probability of CEO turnover is 217% higher following a tariff increase. These results support a non-monotonic relation between competition and CEO turnover. Industry conditions change significantly following a tariff change, so do the skill set required to run the firm successfully. If the CEO lacks the desirable skills and the benefit of hiring a new CEO justifies the costs, CEO turnover will result.

Next, I examine whether the conditions in which the CEO has previously worked play a role in how the firm responds to changes in competition. I add experience dummies as well as their interactions with the tariff cut, and the tariff increase dummies to Equation 4.1.

$$\begin{aligned}\text{Turnover}_{ijt} = {} & \alpha \times CUT_{jt} \times EXP\_CUT_{lt} + \beta \times INCREASE_{jt} \times EXP\_INCREASE_{lt} \\ & + \delta \times CUT_{jt} + \lambda \times INCREASE_{jt} + \rho \times EXP\_CUT_{lt} \\ & + \gamma \times EXP\_INCREASE_{lt} + \eta \times X_{ijt-1} + \theta_t + \mu_i + \epsilon_{ijt}\end{aligned} \tag{4.2}$$

Where i indexes firm, j indexes industry, t indexes time and l indexes CEO. EXP_CUT_{lt} ($EXP\_INCREASE_{lt}$) is an indicator variable that is equal to 1 if the CEO's experience proxy is in the top quartile and 0 otherwise. The variables of interest are the interaction terms between tariff dummies and experiences dummies (i.e., $CUT_{jt} \times EXP\_CUT_{lt}$ and $INCREASE_{jt} \times EXP\_INCREASE_{lt}$). The results are shown in Table 9. I find that CEOs with high-competition skills are 76% less likely to leave either voluntarily or involuntarily following a tariff cut. I find even stronger effects for CEOs with low-competition skills

after tariff increases that are relevant to low competition environment; a CEO with low-competition skills does not face a higher probability of turnover after a tariff increase. The results remain statistically significant and economically meaningful after adding a battery of control variables (Columns 2-3), excluding the event years (Columns 4-6), and adding industry-year fixed effects (Columns 7-9).

My proxies for high-competition or low-competition skills might be simply a proxy for CEO talent. If that is the case, more talented CEOs are expected to be more efficient at running a firm in any conditions and less likely to leave following a tariff change. However, I find that CEOs with high-competition or low-competition skills are as likely as other CEOs to leave in normal conditions. To further address this concern, I include interaction terms between the tariff cut dummy and the low-competition skill dummy, as well as the tariff increase dummy and the high-competition skill dummy. In contrast to this alternative explanation, I find CEOs with high-competition skills are more likely to leave following a tariff increase than CEOs without any low-competition or high-competition skills. There is, however, some evidence that CEOs with low-competition skills are less likely to leave following a tariff cut, which disappears after adding governance controls into the model. These results support the idea that CEO talent and skill are not one-dimensional, and firms must pick a CEO with relevant skills.

4.2 Hiring decisions and tariff shocks

Firms consider CEOs' low-competition and high-competition skills in their turnover decisions. Next, I examine whether they do so in their hiring decision as well. Because my proxies of high-competition and low-competition skills are a relative measure, I need a benchmark to explore whether newly hired CEOs have better high-competition or low-competition skills. The first benchmark is CEOs who work in the industries with the same 2-digit SIC codes as the industry that experiences a tariff shock. These industries likely have comparable conditions and require a similar set of skills for CEOs. If an industry experiences a tariff shock and its desirable skill set changes, one expects firms in that industry to be more likely

to appoint a candidate with the new desirable skill set than firms in other industries.

Figure 3 illustrates this identification. Industry A, B, and C have the same 2-digit SIC code. In each industry, firms that are run by a CEO with the relevant skill are marked. To identify CEOs with relevant skills, I compare a CEO's skill proxy to those of the CEOs in all the industries (Industry A, B, and C) rather than to those of the CEOs in their own industry; the CEOs whose high-competition (low-competition) skill proxies are in the top quartile among all the CEOs are classified as a CEO with high-competition (low-competition) skills. A CEO in industry A was originally compared to other CEOs in industry A, but now her proxy is compared to all the CEOs in industry A, B, and C. Industry A experiences a tariff shock, and the portion of CEOs with the desirable skill set goes up. To empirically test this for every industry, I divide the number of CEOs with a particular skill to the total number of CEOs in that industry to estimate the portion of CEOs with the new definition of skill. Then I examine how this estimated number changes after a tariff shock. Table 10 presents the results. Column 1 and 4 show that firms in an industry that experiences a tariff shock are more likely to hire a CEO with the skill set required to run the firm in the new condition successfully. In terms of economic magnitude, the portion of CEOs with low-competition (high-competition) skills in an industry that experiences a tariff increase (cut) goes up by 60% (45%). Firms do not hire CEOs with low-competition skills following a tariff cut (Column 2) and are less likely to hire CEOs with high-competition skills after a tariff increase (Column 5). These results support the idea that firms consider CEOs' prior experience and match it to their needs. They also provide more evidence that the proxies for low-competition and high-competition skills are not simply a measure of CEOs' talent.

The second benchmark is the skill of the departing CEO. For firms that hire a CEO, I compare the skill proxy of the departing CEO with that of the newly hired CEO. Conditional on hiring a new CEO, a firm is more likely to hire a CEO with better high-competition (low-competition) skills than that of the incumbent CEO following a tariff cut (increase). Column 3 shows that a newly hired CEO is more likely to have better low-competition skills and worse high-competition skills than the incumbent CEO after a tariff increase. Column 6 provides similar results for CEOs who are hired following a tariff cut; the new CEO is more likely to have better high-competition skills and worse low-competition skills than the incumbent

CEO. These results provide evidence that boards consider CEOs' experience in their hiring decisions.

5.0 Robustness Tests and Extensions

5.1 Costs of CEO turnover and firm behavior

So far, we have seen that firms consider CEOs' high-competition and low-competition skills in their hiring and firing decisions. If firms benefit from a CEO with suitable skills, why do some firms that are run by a CEO without the skill retain their CEO? One plausible explanation is the costs associated with CEO turnovers; CEO turnover costs include direct costs (e.g., searching for a replacement, severance or retirement package) and indirect costs (e.g., negative reputation effects for board members, the personal bonding between the CEO and board members) (Taylor, 2010). Taylor (2010) finds that "boards behave as if firing a CEO costs shareholders an estimated 5.9% of firm assets, or $254 million for the median size firm." Similarly, Eisfeldt and Kuhnen (2013) shows that fixed costs of termination cause firms to change their CEOs only when the benefits outweigh the costs. This implies that boards may optimally keep a CEO who lacks the relevant skill. Another reason why some firms do not hire a CEO candidate with relevant competitive experience is that they lack necessary resources (e.g., financial means) that the CEO candidate, once hired, needs to implement new strategies.

To examine the cost explanation, I take two different approaches. First, I replicate my baseline results for smaller and larger tariff shocks. A tariff change is classified as large (small) if the change in the tariff is four (two) times larger than the industry's median change rather than three times used originally. Table 11 reports the results. The first three columns of Table 8 (baseline results) are shown as well to facilitate the comparison. The probability of CEO turnover in the first three years after a large tariff shock is four times higher (Column 9). Small tariff shocks do not considerably affect the likelihood of CEO turnover (Columns 4, 5, and 6); the effect of small tariff shocks is 50% smaller.

I also examine whether the magnitude of tariff shocks affect the magnitude of changes in firm performance around the shocks (Table 12). Panel A shows that the average drop in return on assets is 27% higher following a large tariff cut (Column 5) and that firms do not

experience a decrease in return on assets after a small tariff cut (Column 3). Panel B shows that the increase in Tobin's Q is 38% smaller after a small tariff increase and 8% higher following a large tariff increase. The drop in Tobin's Q is 23% higher following a large cut.

Second, I replicate my main results for firms run by CEOs who are entrenched. Specifically, I look at family firms (CEOs who are related by blood or marriage to the founder or a large shareholder (Pérez-González, 2006)), CEO/chairman duality (CEOs are also the Chairman of the board), CEOs with large stockholdings (CEOs' holdings are above the industry mean), and co-opted boards (the fraction of the board who has been appointed after the incumbent CEO assumed office (Coles et al., 2014)). Entrenched CEOs are, on average, less likely to leave (Table 13). The effect is stronger for family firms and co-opted boards. To put this into perspective, the effect of tariff shocks is canceled out by the entrenchment effect in family firms. In other words, the probability of turnover is not higher after a competition shock for family firms. One standard deviation increase in Co-opt results in almost a 20% (%30) lower probability of turnover after tariff cuts (increases). CEOs who hold stock more than industry mean are less likely to be fired following tariff increase (more than 80%), but not after tariff cuts. Being the chairman does not seem to affect the probability of turnover following a competition shock.

5.2 CEO experience and firm performance

In this section, I examine whether relevant competition skills affect firm performance. Because firm performance, and CEO-firm matching are both endogengous, one would only be able to observe effects of CEO experience on firm performance when firms are out of equilibrium. If firms are at equilibrium and CEO-firm matching is optimal, then there will be no cross-sectional relation between managerial experience and firm performance (Hermalin and Weisbach, 2003). Given the results presented so far, it is plausible to assume that there are frictions in the CEO market (e.g., search costs, severance packages given to departing CEOs), which prevent firms from having their ideal CEOs all the time. A tariff shock changes firm needs drastically and forces companies out of equilibrium. If some firms do not hire a

CEO with a relevant skill set, we would expect to observe effects of CEO competitive skill sets on firm performance.

I hypothesize that CEOs with suitable experience outperform CEOs who lack the skill. To test this, I follow prior literature (Denis and Denis, 1995; Bennedsen et al., 2012) and investigate how firm performance changes for these two groups of CEOs. The variables that are commonly used in the literature for firm performance are return on assets and Tobin's Q. Following (Dasgupta et al., 2017), I exclude firms with foreign operations. Foreign income taxes paid are used to identify firms with foreign operations (Foley et al., 2007). I specifically test the following model:

$$\begin{aligned}\text{Performance}_{ijt} = \alpha \times CUT_{jt} \times EXP\_CUT_{lt} + \beta \times INCREASE_{jt} \times EXP\_INCREASE_{lt} \\ + \delta \times CUT_{jt} + \lambda \times INCREASE_{jt} + \rho \times EXP\_CUT_{lt} \\ + \gamma \times EXP\_INCREASE_{lt} + \eta \times X_{ijt-1} + \theta_t + \mu_j + \epsilon_{ijt}\end{aligned} \tag{5.1}$$

Where i indexes firm, j indexes industry, t indexes time and l indexes CEO. EXP_CUT_{lt} ($EXP\_INCREASE_{lt}$) is an indicator variable that is equal to 1 if the CEO's experience proxy is in the top quartile and 0 otherwise. The variables of interest are the interaction terms between tariff dummies and experiences dummies (i.e., $CUT_{jt} \times EXP\_CUT_{lt}$ and $INCREASE_{jt} \times EXP\_INCREASE_{lt}$). Control variables ($X$) include assets, and R&D. θ_t and μ_i are year and firm fixed effects, respectively. Firm and industry fixed effects control for unobservable time-invariant differences among firms and industries. They also alleviate the concern that firms with certain characteristics hire CEOs with relevant skills and perform better following a competition shock. Time fixed effects control for macroeconomic shocks. The error terms are clustered at the industry level.

Table 14 reports the results. Column 2 of Panel A shows that returns on assets, on average, are 2.89 (58%) percentage points lower in the three years following a tariff cut. However, firms that are run by a CEO with high-competition skills do not experience lower returns. Following Hombert and Matray (2018), I control for firm size (Columns 3-7) and R&D (Columns 5-7). The results remain significant and economically meaningful. Firm

fixed effects partially address the concern that a CEO with the suitable skill set for highly competitive conditions may join a firm that outperforms others following a tariff cut. In addition, I control for time-invariant industry characteristics by adding industry fixed effects (Columns 2, 4, and 6) and for time-varying industry characteristics by adding industry (2-digit SIC code)-year fixed effects. Firms that are run by a CEO with low-competition skills, on the other hand, are more likely to experience a larger drop following a tariff cut (Columns 1, 3, and 5). It is noteworthy that high- and low-competition skills do not seem to affect return on assets in normal conditions, reiterating that these measures are not a proxy for CEO talent.

Panel B of Table 14 presents results for long-term performance. Tobin's Q, on average, are 31% higher in the first three years after a tariff increase (Column 2). Firms that are run by a CEO with low-competition skills, on average, experience a 60% increase in Tobin's Q. The results are robust to adding firm fixed effects (Column 1, 3, and 5), controlling for firm size (Columns 3-7) and R&D (Columns 5-7), and adding in industry (2-digit SIC code)-year fixed effects (Column 7). On the other hand, firms that are run by a CEO with high-competition skills, if anything, experience a drop in Tobin's Q in the first three years after a tariff increase (Column 1). Firms, on average, experience a drop in Tobin's Q following a tariff cut, only if they are not run by a CEO with high-competition skills. Overall, these results show that firms that are run by a CEO with relevant competition skills outperform firms whose CEOs lack the skill.

Firms take into account the costs and benefits of a wide range of responses before responding optimally and differently to tariff shocks, responses ranging from updating infrastructure (Bustos, 2011), to restructuring (Bloom and Van Reenen, 2007), and to entering a new business segment. Given that hiring a new CEO is costly, firms decide to change their CEOs only when the benefits of a CEO with relevant skills outweigh the costs, implying that some firms optimally do not hire a new CEO even though the incumbent lacks the skill. To further investigate the role of CEOs' experience and disentangle effects of managerial experience from those of CEO turnover, I examine differences in performance of firms run by a CEO with the relevant skills and firms run by a CEO without the relevant skill for two groups: 1) a group of firms that do not have a CEO turnover (Panel A and B of Table 15),

2) a group of firms that hire a new CEO (Panel C and D of Table 15) following a tariff shock. The idea is that to disentangle as much as possible the effects of CEO turnover from those of CEO experience.

For the first group, I start with firms that experience a tariff cut and do not hire a new CEO. I calculate 2-year ($ROA_{t+1} - ROA_{t-1}$), 3-year ($ROA_{t+2} - ROA_{t-1}$), and 4-year ($ROA_{t+3} - ROA_{t-1}$) changes in return on assets and changes in the 3-year average return. Then I match firms that are run by a CEO with the high-competition skill (treated) with those that are run by a CEO who lacks the skill (matched). I match firms by size, return on assets in the year prior to the tariff cut. Then, I compare the changes in return on assets for treated and matched firms. Panel A of Table 15 shows the results. Firms that are run by CEOs with high-competition skills outperform those that are run by CEOs who lack the skills. The effect of experience on performance following a tariff cut magnifies as time passes. I repeat the same analysis for firms that are run by a CEO with low-competition skills, using Tobin's Q as a proxy for firm performance. These firms weakly underperform others following a tariff cut. Panel B of Table 15 reports the results for firms that experience a tariff increase and do not hire a new CEO. I find a similar pattern for firms that are run by a CEO with low-competition skills: they significantly outperform those that are run by CEOs without skills relevant to low competition.

For the second group, I begin with firms that experience a tariff cut and a CEO turnover in the first three years following the cut. I calculate 2-year ($ROA_{t+1} - ROA_{t-1}$), 3-year ($ROA_{t+2} - ROA_{t-1}$), and 4-year ($ROA_{t+3} - ROA_{t-1}$) changes in return on assets and changes in the 3-year average return. Then I match firms that hire a CEO candidate with the high-competition skill (treated) with those that hire a CEO candidate who lacks the skill (matched). In cases where there are no matches in the same industry, I pick a match from an industry that experiences a tariff cut and is in the same 2-digit SIC code. I find that firms that hire a candidate with high-competition skills, on average, have 6.32 percentage points higher return on assets in the three years after the turnover (Panel C of Table 15). Similarly, I find that firms that hire a candidate with low-competition skills, on average, have higher Tobin's Q in three years following the turnover (Panel D of Table 15). In untabulated results, I find qualitatively similar results when I regress firm performance measures on

industry and year fixed effects and use residuals to performance the same analyses. Overall, CEO competition experiences seem to be correlated with firm performance.

Because firms hire a new CEO with a certain skill set based on firm needs to implement particular strategies, the endogeneity problem of CEO turnover is more severe in the first few years post-appointment. To further address this problem, I exclude the first three years of CEO tenure to examine the effect of CEO experience on firm performance (Table 16). Specifically, the treatment group includes firms that have hired a CEO with the relevant skill set at least three years before a tariff shock and retain their CEOs for at least three years after the shock. The control firms are those that retain their CEOs after tariff shocks and satisfy one of the following conditions:

- They have hired a CEO who lacks the relevant skills at least three years before the shock (Panel A)
- They have hired a CEO with the relevant skills right before the shock (Year -1 or Year 0) (Panel B)
- They have hired a CEO with the relevant skills for at least three years but are in a different industry that does not experience a tariff shock (Panel C)

Panel A shows that CEOs with relevant experience outperform those who lack the skill even when the endogeneity is less of a concern. So far, we have compared firms whose CEOs have the desirable skill set to firms whose CEOs lack the skill. It is not unreasonable to assume these two groups of firms are fundamentally different and that their difference is driving the results. To address this valid concern, I use firms that have hired a CEO with a relevant skill set right before the competition shocks as a control group (Panel B). The only difference between the treatment and control groups is CEO tenure. If it takes time for CEOs to imprint their style on firm policies, we expect to see stronger effects later on in their tenures. The results show that the performance difference between the treatment and control groups fades away as time goes by, providing stronger evidence on the positive effect of CEO experiences on firm performance. Finally, in Panel C, I use performance of firms run by a CEO with a desirable skill set in an industry that does not experience a tariff shock. Once again, the endogeneity of CEO-firm matches is less of a concern because both

treatment and control groups consist of firms run by a CEO with relevant skills. The results show that CEO experiences relevant to high (low) competition have positive effects on firm performance only when firms experience a tariff cut (increase).

Given the endogenous nature of CEO-firm matches, these results should not be construed as a causal relationship but as a correlation between managerial experience and firm performance. This correlation between CEO characteristics and firm performance can be explained in two ways (Bandiera et al., 2017). First, it is possible that heterogeneity in firm characteristics is responsible for both CEO selection and firm performance. Under this interpretation, firms that hire a CEO with a relevant skill set must have better performance before CEO appointments and must not show a gradual improvement in their performance following CEO appointments. This explanation cannot be the case because the results remain significant even after adding fixed effects and controlling for returns prior to competition shocks. Moreover, firm performance before CEO appointments has no explanatory power for firms' choice of CEOs. Finally, we observe a gradual improvement in firm performance following the hire of a CEO with a relevant skill set. Overall, the results show that the correlation between firm performance and CEO competitive skill sets are not merely a reflection of time-invariant firm characteristics or performance trends before CEO appointments.

The second explanation is that CEO characteristics affect firm performance. This interpretation itself can be divided into two: 1) CEOs can be ranked vertically: some CEOs are more talented than others, and 2) CEOs can be ranked horizontally: there are no "good" or "bad" CEOs, just "good" or "bad" CEO-firm matches. Under the first explanation, CEO skills are one-dimensional, and talented CEOs can improve firm performance regardless of firm characteristics and needs. If there are a limited number of talented CEOs, some firms will end up with untalented ones, and their performance would suffer. However, the results show that firms run by CEOs with relevant skill sets only outperform after competition shocks and have no performance advantage in normal conditions. Under the second explanation, if there are frictions in the market that prevent some firms from having their ideal matches, we would expect to see a performance loss in firms run by CEOs who lack the desired skill sets. The latter seems to be the only possible explanation because of performance improvements following appointing a CEO with skills relevant to high and low competition.

As discussed before, despite undeniable roles of CEOs in firm outcomes, showing causal links between CEO characteristics and firm performance is an arduous task (Custódio and Metzger, 2014), mainly because firm performance, the quality of CEO-firm matches, other firm characteristics (e.g., governance) are endogenous, which is supported by the results presented in this paper. The relationship between the quality of CEO-firm matches, firm characteristics, and performance are two-sided: the quality of CEO-firm matches affects firm characteristics and performance, and, at the same time, is affected by those two.

Even though using exogenous competition shocks partly mitigates the endogeneity problem, simply estimating effects of CEO experience on firm performance would lead to uninterpretable results. For instance, the decision to hire a new CEO depends on factors such as financial conditions, the pool of candidates, and the board's expectation regarding both the impact of the competition shock and the benefits of a new CEO. It may be the case that a financially constrained firm benefits from implementing strategies suitable for high-competition following a tariff cut, but the firm may not be able to do so or even attract a potential candidate with relevant skills due to financial constraints. In this case, the firm's financial constraints cause both underperforming and the poor CEO-firm match.

To convincingly establish the impact of CEO characteristics on firm performance, we would ideally need a random assignment of CEOs with different competitive skill sets to firms with high- and low-competition needs, which is close to impossible in the CEO literature. Without a random CEO assignment, regressing CEO characteristics on firm performance would result in inconsistent estimations in which both the magnitude and the sign of coefficient could be wrong due to omitted variable biases (Adams et al., 2009). In this literature, the variation in managerial experience usually comes from CEO turnover (the new CEO may have a different skill set from the departing CEO). The problem is that even with exogenous CEO departures (e.g., CEO death), hiring a new CEO is always endogenous.

To address this concern, I exploit a two-stage least squares (2SLS) setting. This estimation framework would control for any time-varying unobservable factors that impact both CEO selection and firm performance. Because my proxies for CEO skills are endogenous dummies, which are nonlinear models, using traditional 2SLS estimations leads to what is called a forbidden regression (Wooldridge, 2010). In 2SLS settings, only OLS estimations

of the first stage are guaranteed to produce a consistent estimator in the second stage. To avoid plugging in incorrect nonlinear fitted values from the first stage, I follow Adams et al. (2009) and take the following steps. First, I use a probit function (nonlinear function) to estimate nonlinear fitted values for the probability of having a CEO with high- and low-competition experience using an instrument (i.e., being a family firm). Second, I use these nonlinear fitted values as instruments in the first stage of a conventional 2SLS. The interaction terms between experience and tariff shocks are instrumented by their corresponding interactions between the instrument variable and tariff shocks. Finally, I regress firm performance on the fitted probabilities generated in the first stage to estimate the effects of managerial experience. Unlike conventional 2SLS estimates, this procedure is believed to result in consistent coefficients because it accounts for the binary nature of the endogenous dummy, and standard errors are asymptotically valid (Adams et al., 2009).

The variable that I use as an instrument is a dummy variable that is equal to one if the firm is a family firm and zero otherwise. The idea is that as presented in this paper, family firms are less responsive to industry shocks because they tend to appoint someone who is related to them by blood or relationships. They behave as if their costs of CEO turnover are far more than those of non-family firms. I exploit this variation in costs of CEO appointments to examine the impact of having good CEO-firm matches on firm performance following tariff shocks. A possible caveat is that being a family firm may affect performance through channels other than the quality of CEO-firm matches. For instance, family firms may not engage in product differentiation as much as other firms do. So when low-cost manufacturers come in after a tariff cut, family firms' sales will be hit the most. However, one can argue that less differentiation is caused by a poor CEO-firm match. In that sense, time-varying firm characteristics are a by-product of CEO selection.

Panel A of Table 17 shows the results for the first stage. As expected, the proposed instrument is negatively correlated with the probability that the CEO has a skill set relevant to high and low competition, with robust (clustered by industry) z-statistics of -8.06 (*Exp_Cut*) and -10.83 (*Exp_Increase*). The results remain significant and economically meaningful even after controlling CEO power (i.e., CEO tenure, CEO's holding, and dual CEO/chair). Firm size (i.e., total assets), a proxy for growth opportunity, is correlated positively to high-

competition skills and negatively to low-competition skills. The F-statistics are 63.87 and 22.79 for the null hypothesis that the instruments are jointly zero, which are significantly above the threshold level of 10 recommended by Stock et al. (2002), suggesting that the instruments are not weak.

The results from the second stage are shown in Panel B of Table 17. The coefficients of interest are the interaction terms between tariff shocks and corresponding CEO skill sets. Note that *Exp_cut* (*Exp_increase*) is not a dummy anymore and is fitted probabilities of having a CEO with high-competition (low-competition) skills from the first stage with the mean and median of 0.125 (0.123) and 0.121 (0.117) respectively. After tariff cuts, firms run by CEOs with high-competition skill sets have higher returns on assets and value. Similarly, firms whose CEOs have skill sets relevant to low competition are more likely to outperform following a tariff increase. The results are slightly less significant relative to OLS estimations, which is expected due to higher standard errors in instrumental variable settings.

In terms of the magnitude of these effects, replacing a CEO who is ranked at the bottom 25 percent based on her high-competition skills with a CEO ranked at the top 25 percent, an increase of 0.15 units in *Exp_cut*, causes return on assets to increase by 4.65 percentage points following a tariff cut. Similarly, hiring a CEO ranked at the top 25 percent based on low-competition experience to replace a CEO ranked at the bottom 25 percent (an increase of 0.10 units in Exp_increase) results in an increase of 0.91 units in firm Tobin's Q following a tariff increase. These results are comparable to the findings of Bennedsen et al. (2007) that appointments of a less skilled CEO cause return on assets to fall by at least four percentage points. More importantly, these results can be regarded as the proximate costs of CEO turnover. Taylor (2010) argues that firms behave as if CEO turnover costs 5.9% of firm assets, which consists of entrenchment costs of somewhere between 1.3% to 4.6%. My estimated gain of 4.65% in return on assets is very close to Taylor (2010)'s upper bound (4.6%), which is not surprising given that family firms, used as IVs, are expected to have high costs of turnover. Overall, the results provide the first evidence of causal links between managerial competition experience and firm performance.

5.3 Tariff shocks and CEO compensation

In the spirit of Cuñat and Guadalupe (2009), I first examine whether and how firms that retain their CEOs change CEO compensation in response to a tariff shock. Table 18 shows the results for the univariate test. Firms incentivize CEOs to exert more effort by increasing total compensation after a tariff cut (Panel A), which is consistent with Cuñat and Guadalupe (2009) and "business stealing effect" but is in contrast with "liquidation effect." This increase in compensation comes in the form of stock and options. If firms put in place compensation schemes that incentivize CEOs to implement cost-cutting strategies following a tariff cut, we would expect to observe a decrease in stock and option compensation (i.e., long-term compensation) rather than an increase. However, note that competition is not the only factor that affects compensation plans. As discussed before, the increase in option and stock compensation can be consistent with "camouflage," financial constraints, and a higher probability of bankruptcy. Following a tariff cut when firms are struggling financially, it is hard for CEOs to justify high cash compensation. So, either CEOs intentionally choose to receive or firms decide to pay higher stock and options. The higher total and equity compensation are also consistent with a larger risk premium for bearing higher bankruptcy risks.

On the other hand, firms lower long-term compensation (i.e., options and stock) and, consequently, total compensation after a tariff increase (Panel B). This is consistent with CEO bargaining power and "pay for luck." Overall, the univariate results show that competition may not be the only factor that affects CEO pay, making it harder to study the role of competition in managerial compensation empirically. To control for industry heterogeneity, I replicate the univariate results using industry-adjusted compensation (Panel C and D). The results both statistically and economically remain the same.

Next, I formally examine the role of tariff shocks in managerial compensation. The results from difference and difference estimations are shown in Table 19. The results are in line with those of the univariate test, showing that firms, on average, increase equity compensation in response to a tariff cut while they increase short-term compensation (e.g., cash and bonus) following a tariff increase. Firm fixed effects control for time-invariant firm characteristics.

The results are robust to controlling for CEO entrenchment, return on assets, and firm size (Panel B), as well as adding industry fixed effects (Panel C and D).

In addition to the level of pay, firms may change the sensitivity of pay for performance after tariff shocks (Table 20). After a tariff cut, firms seem to lower the sensitivity of pay for short-term performance (ROA) and weakly increase the sensitivity of pay for long-term performance (Tobin's Q) (Columns 3 and 4). The sensitivity of pay for short-term performance goes up while that of pay for long-term performance goes down following a tariff increase. There are several possible explanations for these findings. First, in the noisy environment following a shock, firms do not want to punish or reward CEOs for performance that is beyond CEOs' control: lower returns following a tariff cut and higher stock prices after a tariff increase. In other words, based on industry conditions, firms put more weight on a performance measure that is the most accurate proxy for CEOs' effort or skills. However, because the volatility of stock prices is higher following a tariff cut, and because higher sales after a tariff increase cannot be attributed to managerial effort, this channel cannot explain the results. Second, the results are consistent with CEO power: CEOs choose the most lenient performance measure to be used for compensation. Third, because stock volatility goes up after tariff cuts and goes down following tariff increases, and the value of option compensation highly depends on stock volatility, it mechanically seems as if firms increase (decrease) the sensitivity of pay for long-term performance after a tariff cut (increase). I find support for the second explanation by breaking compensation into long-term and short-term (Columns 5-8). To determine CEOs' salary and bonuses, firms put more (less) weight on long-term performance and less (more) weight on short-term performance following a tariff increase (cut). These results are consistent with the idea of a noisy environment and CEO power.

Next, I further explore channels through which higher competition leads to higher total and equity compensation. Specifically, I examine whether firms' poor financial conditions after tariff cuts can explain the results. I use four proxies for financial constraints. Firms are considered financial constrained if they are ranked in the top tercile based on their KZ-index (Kaplan and Zingales, 1997) (Panel A) and WW-index (Whited and Wu, 2006) (Panel B) or if they are a non-dividend payer (Panel C) or have Altman Z-scores (Altman,

1968) below 1.8 (Panel D). The results in Table 21 show that financially constrained firms increase stock and option (cash and bonus) compensation following a tariff cut (increase). However, it is hard to argue how compensation compositions have been affected because we did not account for the changes in total compensation. Table 22 shows how different parts of CEO compensation as a percentage of total compensation change after competition shocks. Regardless of the choice of proxies, financially constrained firms seem to lower the short-term portion of compensation (i.e., salary, bonus, cash) following a tariff cut while offering more stock or options to their CEOs. This is consistent with managerial power ("camouflage"), financial constraints, and a higher probability of bankruptcy explanations. On the other hand, financially constrained firms tend to reward their CEOs with bonus, or cash after a tariff increase while lowering the long-term portion of compensation. This is consistent with managerial power ("windfall" or "pay-for-luck"). Overall, the results can be explained mostly by the role of management power in setting CEO compensation schemes.

Furthermore, I investigate the relationship between CEO experience and CEO compensation. Specifically, I examine how compensation of CEOs with high- and low-competition skills are different from compensation of CEOs who lack those skills and how these differences change following a tariff shock. The results from the univariate test show that before a tariff cut, CEOs with high-competition skills receive higher total compensation resulted from higher option compensation relative to CEOs with no skills (Panel A of Table 23). CEOs with low-competition skills have a lower bonus but higher stock compensation relative to CEOs with no skills. After a tariff cut, CEOs with high-competition skills receive even more compensation relative to CEOs with no skills. Extra compensation is in the form of stock and options. The results can be explained by CEO power: CEOs with desirable skill sets (i.e., high-competition skills) have higher bargaining power following a tariff cut.

Before a tariff increase, CEOs with low-competition skills are paid less (total compensation), even though they receive higher salaries relative to CEOs with no skills (Panel B of Table 23). Unsurprisingly, CEOs with low-competition skills have higher total compensation relative to CEOs with no skills after a tariff increase, while there is no notable difference between CEOs with high-competition skills and CEOs with no skills. This finding once again attests to higher managerial power for CEOs with desirable skill sets after tariff shocks. The

results hold when I control for industry heterogeneity (Panel C and D).

Next, I formally examine the relationship between managerial experience and compensation using triple difference estimations (Table 24). The results mirror the findings of the univariate test. Firms lower short-term compensation for CEOs with high-competition skills and reward them with more stock after a tariff cut. In other words, firms behave as if they put more weight on long-term compensation after tariff cuts. As explained before, the reason could be that CEOs with high bargaining power ask for higher compensation, but to hide it from shareholders, the increase in compensation is in the form of stock and options. The same is true for CEOs with low-competition skills after a tariff increase when they receive higher salaries and cash for the increase in firms' revenue in which they played no part.

5.4 Corporate governance and CEO turnover

It is plausible to assume that firm governance affects their firing and hiring decisions after competition shocks. On the one hand, better-governed firms are expected to be more responsive to industry conditions and proactively change their CEOs when needed. That is, firms with good governance are more likely to have CEO turnover (positive effects). On the other hand, they are expected to be better suited to tolerate industry shocks and to have a better CEO-firm match, to begin with. Put differently, firms with good governance are less likely to change their CEOs following a competition shock (negative effects).

Using different measures of governance, I examine whether and how governance affects firms' firing decisions (Table A1). The results show that firms with poor governance are more likely to change their CEOs after a tariff cut but not after a tariff increase, which is consistent with the findings of Dasgupta et al. (2017). This can be explained by a higher probability of bankruptcy after a tariff cut. Because bankruptcy has a significantly negative reputation effect for directors, tariff cuts lower agency problems of directors and cause poorly governed firms to increase the quality of their CEO matches. However, firms with strong governance seem to proactively respond to tariff increases to take advantage of the short window of opportunity and update their technology. This strategy fits well with the "anticipated escape-

competition" hypothesis.

5.5 CEO replacement

In this section, I further examine how firms choose a new CEO. Panel A of Table A2 shows statistics about new hires. CEOs are divided into three categories: *Firm Insider*, *Industry Insider* whose last job was at another firm in the same industry, and *Industry Outsider* whose last job was at a firm in a different industry. Firms disproportionately hire someone from their own organization (*Firm Insider*). This pattern exists for both forced and unforced turnovers. *Industry Outsider*, and *Industry Insider* are the second and third, respectively, favorite options for firms hiring a new CEO. Unsurprisingly, after a forced turnover when firms want a change of pace, they are more likely to prefer an outsider over a candidate from within the firm.

Next, I use a multinomial logit model to examine whether competition shocks, as well as their magnitudes affect firms' choices of replacement. The benefits of this test are twofold. First, it provides evidence on whether competitive experiences are general skills that is transferable across firms and industries. Second, the value of competitive experience is juxtaposed with that of industry- or firm-specific experience. Relative to the baseline, which is hiring a *firm insider*, only the marginal increase in the probability of hiring an *industry outsider* is %6.54 higher following a tariff increase, and firms do not appear to show any preference over *Industry Outsider* or *Industry Insider* (Panel B of Table A2).

Next, I examine whether the choice of CEO replacement is affected by the magnitude of competition shocks. The results show that firms are more likely to hire an *Industry Outsider* following a larger competition shock ($4 \times Median$) than following a small competition shock ($2 \times Median$). Relative to the baseline, which is hiring a *Firm Insider*, the marginal increase in the probability of hiring an *Industry Outsider* is 43% (2.9%) higher following a large tariff increase (cut), while this probability is insignificant after a small shock. These findings show that skills relevant to high- and low-competition are general skills and transferable across firms and industries. After a large competition shock when the value of competition skills

is higher, firms put more weights on these competition experiences relative to industry- and firm-specific experience.

Given that firm governance affects the decision to hire a new CEO, it is plausible to assume it also plays a role in the skill choice of new hires. So, I examine whether and how governance affects firms' decision to hire a CEO with certain competitive experiences. The effect of governance on CEOs' skill sets are in line with its effects on firing decision (Table A3). Poorly governed firms are more likely to hire a CEO with high-competition skills after a tariff cut, while better-governed firms are more likely to hire a CEO with low-competition skills after a tariff increase. Surprisingly, firms with strong governance do not appear to hire a CEO with high-competition skills after a tariff cut. It may be the case that firms with strong governance, which do not change their CEOs after tariff cuts as frequently as others, are equipped to deliver optimal strategies even without a CEO with high-competition skills at the helm.

5.6 Exogeneity of tariff Shocks

There is a legitimate concern over the exogeneity of tariff increases because certain industries (e.g., steel industry) are more likely to experience a tariff increase. My identification is immune to this concern so long as the timing of the shocks is exogenous. This can be better understood in the context of stuides that use natural disasters as an exogenous shock. For instance, Florida and New Orleans are more prone to hurricane than Pennsylvania. However, because the timing of hurricanes is unknown in advance and is unaffected by firm or industry conditions, hurricanes are perceived to be exogenous.

We have seen that industry conditions cannot predict tariff changes. Here I examine whether firms contemplating changing their CEOs foresee competition shocks. There are two scenarios. First, firms may wait until a shock happens then change their CEOs. In this scenario, we would expect to see a temporary decline in CEO turnover right before the shock. By postponing the hiring of a new CEO to after the shock, boards would have a full understanding of the new industry conditions and the types of skills that are requisite

for successfully running the firm in these conditions. The downside is that the firm would have to compete with others to hire a CEO with a relevant skill set. Second, firms may hire a CEO before the shock to escape the competition for CEOs with relevant skills after the shock at the risk of not fully knowing the effects of the shock. In this scenario, there would be a temporary increase in CEO turnover before the shock.

The results show no changes in turnover behaviors of firms in one, two, or three years before a tariff shock (Table A4). The findings are robust to adding control variables, firm and year fixed effects. These results provide more evidence on the exogeneity of tariff shocks.

5.7 Alternative definitions for CEO experience

5.7.1 Adding capital spending to the skill measures

Firms may lower their capital spending when faced with high competition from foreign low-cost manufacturers. So they may need someone in charge who can effectively lower investment without losing too much of their comparative advantage in the future. To account for this need, I add capital spending to the other six characteristics (changes in sales, asset sales, costs of goods sold, competition, and selling, general, and administrative expenses) that are used for constructing a proxy for low-competition skill sets. The results are qualitatively the same: CEOs with relevant skills are less likely to leave following a tariff shock (Table A5). This is not surprising given that using principal component analyses makes the impact of an individual variable on the final proxy smaller.

5.7.2 Length of experience measures

For constructing proxies for CEO skills, the conditions are considered in which a CEO has worked in the ten years before joining her current firm. In this section, I examine whether the results are robust to changing the duration over which the proxies are measured. Two sets of proxies are constructed using the conditions in which a CEO has worked in the last 15 and five years before joining her current firm. Then, I examine the baseline model

(Equation 4.2) using these two sets of proxies. Using the last 15 years, I find that CEOs with high-competition skills are 48% less likely to leave in the first three years following a tariff cut and that CEOs with low-competition skills are 27% less likely after a tariff increase (Table A6). Using the last five years to construct the proxies yields the same results: CEO with high-competition skills are 72% less likely to leave in the first three years following a tariff cut, and the probability of turnover for CEOs with low-competition skills does not increase after a tariff increase. There are two possible explanations for stronger effects when the last five years are used. First, executives are more likely to hold higher-ranked positions in the immediate years before becoming a CEO than positions held early in their careers. The responsibilities in these positions resembe those they have as a CEO, so the experience they acquire during these years tend to have stronger effects on their performance as a CEO. Second, it may be a time effect or salience effect; the more recent conditions may have stronger effects on executives' skills than the condition they experienced earlier in their careers. Moreover, boards may put more weight on the conditions in which CEOs have worked in recent years because they are better proxies for types of conditions in which the candidate may be comfortable working. I further examine these two explanations in the next section.

5.7.3 Executive experience

As discussed before, it is plausible that experiences acquired through performing tasks that are comparable and closely related to the tasks performed by a CEO may be more beneficial and helpful when one runs a firm. I examine this by replicating the main table using a new proxy for CEO experience: the experience acquired while served as an executive (CEO, CFO, COO, or president). The results are qualitatively the same (Table A7). Unsurprisingly, I find stronger effects of CEOs' experience on CEO turnover: CEOs with relevant skill sets are less like to leave and more likely to be retained.

5.8 Using probit models

The main problem with using a linear probability model (LPM) is that it does not ensure the predicted probability of an event to be between 0 and 1. The common solution to address this concern is to use a probit model. Note that using probit models with fixed effects may result in biased estimations (Greene, 2002). I replicate the baseline models (Equation 1, 2) using a Probit model. I find that the marginal effects of tariff cuts and increases on CEO turnover are 4.4% and 4.1%, respectively (Panel A of Table A8). The marginal effects of high-competition skills following a tariff cut and low-competition skills after a tariff increase are -10.7% and -11.6%, respectively (Panel B of Table A8). Overall, the results using probit models support the results using LPM.

6.0 Conclusion

This paper exploits the staggered changes (both increase and decrease) in product import tariffs across industries and through time as a quasi-natural experiment to examine whether CEOs' experience in relevant competitive conditions influences the CEO-firm match. Prior literature focuses on one-side of competition shocks, whereas this paper is the first to study both sides of competition shocks. I find a non-monotonic relation between the likelihood of CEO turnover and competition. This result warrants further research on the role of low competition environments in corporate policies and decisions.

Based on competitive conditions in which a CEO has worked, I construct two measures of the specialty of skills: 1) low-competition skill, 2) high-competition skill. I find that CEOs with relative competition skills are less likely to leave following a tariff shock and that firms are more likely to hire a candidate with the desirable skill. This evidence suggests that boards consider CEOs' competition experience in hiring and firing decisions. I also find that firms run by CEOs with the desirable skills outperform those run by CEOs who lack the skills.

Consistent with the notion that CEO turnover is costly, firms only appoint a CEO with a relevant skill set if the benefits outweigh the costs. Alternatively, firms might choose to change compensation schemes to motivate CEOs to implement desirable strategies if the benefits of turnover are not sufficiently high. However, the results show that firm financial conditions rather than investment strategies are the deciding factor for designing compensation plans. Moreover, the findings provide evidence on the undeniable role of managerial power in compensation plan and the importance of accounting for CEO power when studying CEO compensation.

Overall, findings suggest that boards need to constantly monitor firm conditions and take necessary actions to improve the CEO-firm match. They also show that CEO skills and abilities vary over time and are not fixed.

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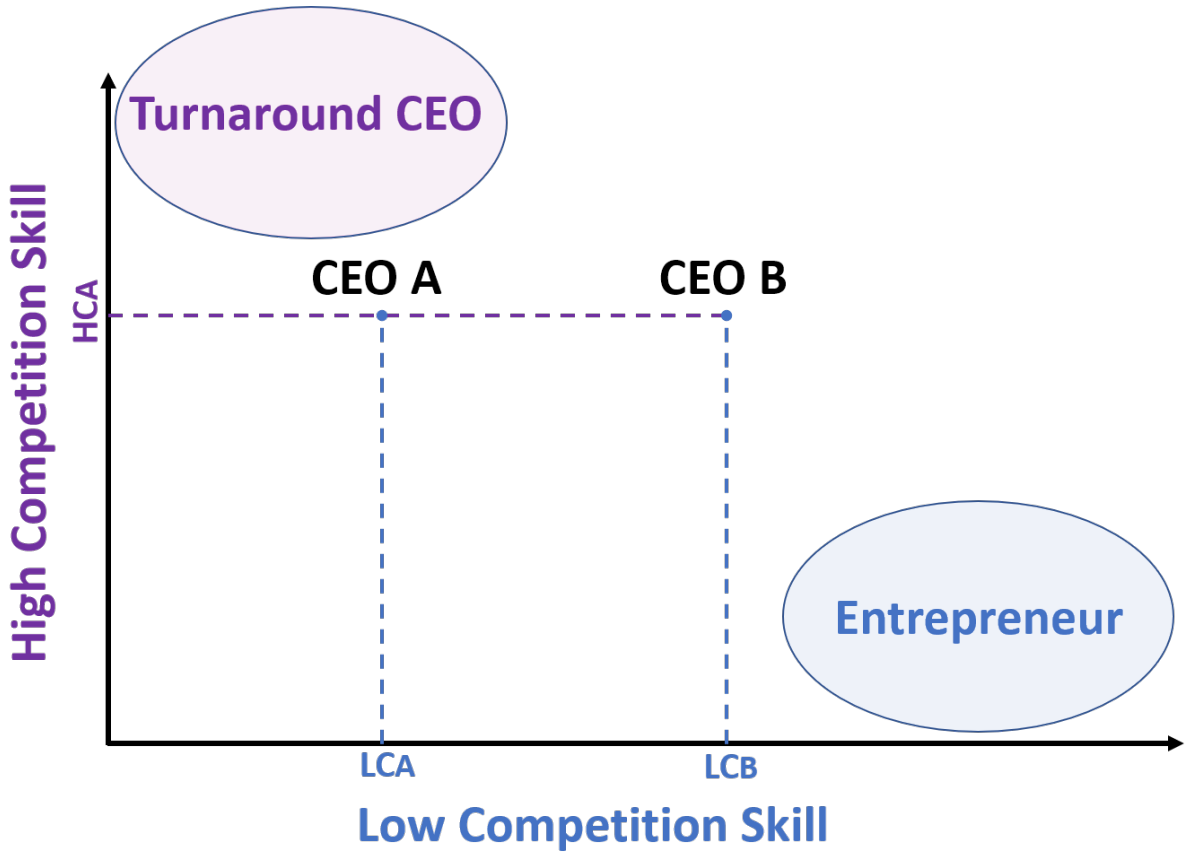
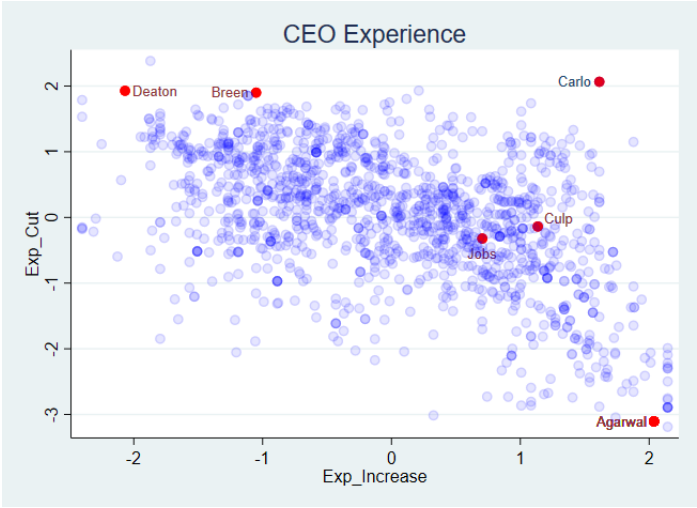
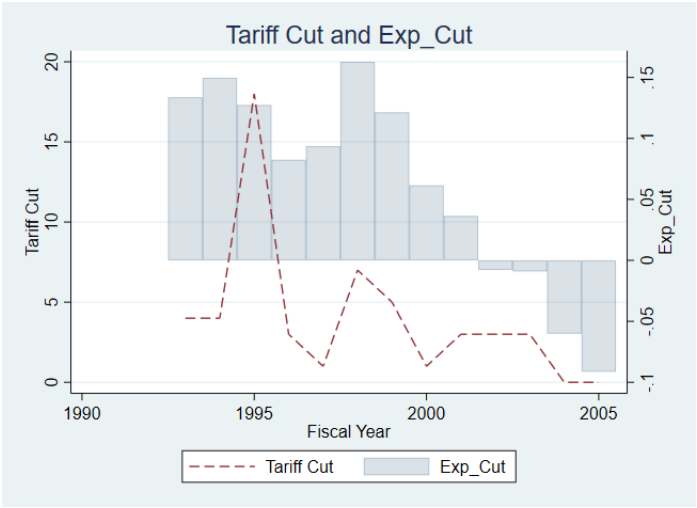


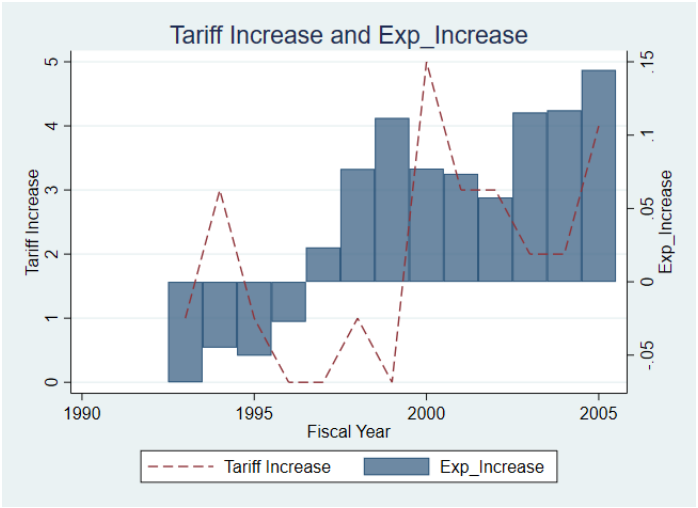
Figure 1: **CEO experience.** This figure presents a schematic relation between high- and low-competition skills for managers.



(a) High-competition and Low-competition skills



(b) high-competition skills and Tariff Cuts



(c) low-competition skills and Tariff Increases

Figure 2: **High-competition and low-competition skills.** This figure presents the relation between high-competition and low-competition skills for CEOs (2A), between the average high-competition (2B) and low-competition (2C) and the number of tariff changes by year from 1993 to 2005. Indices for low-competition and high-competition skills are constructed based on CEOs' prior experience. The sample consists of CEOs of manufacturing firms from 1993 to 2005. Tariffs are computed at the three-digit SIC industry level. An industry experiences a major tariff cut (increase) if the tariff reduction (increase) is three times larger than the average tariff cut (increase) in that industry. The sample consists of CEOs of manufacturing firms from 1993 to 2005.

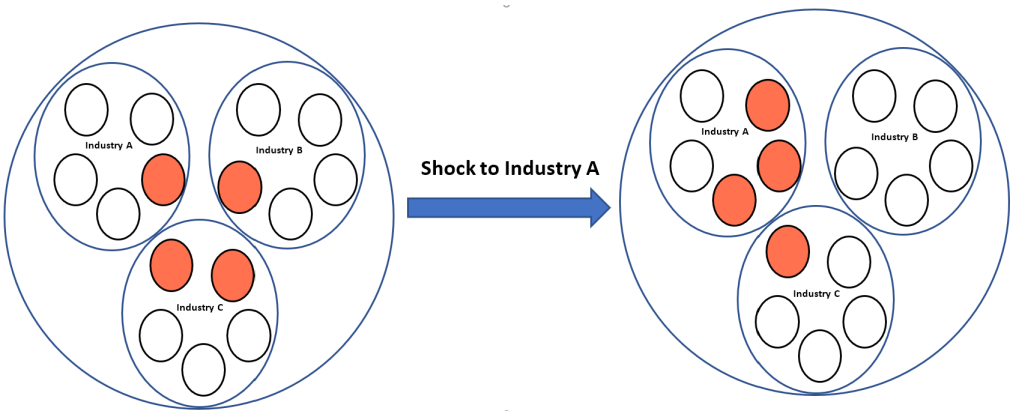


Figure 3: **Competition shocks and hiring a CEO.** This figure shows how firms are expected to respond to a tariff shock through CEO turnovers. Industries A, B, and C have the same two-digit SIC codes. Firms that are run by a CEO with the relevant skill are marked. Industry A experiences a tariff shock.

Table 1: **Summary Statistics**

This table presents summary statistics for my sample of about 7,000 firm-year observations. The sample consists of manufacturing firms (SIC codes 2000-3999) in the Compustat/ExecuComp/CRSP. The sample period is between 1992 and 2005. All variables are defined in the appendix.

Panel A: Descriptive Statistics

Variable	N	Mean	Std Dev	25th Pctl	Median	75th Pctl
ROA	7004	0.051	0.413	0.015	0.059	0.105
Buy&Hold	6995	0.193	0.722	-0.158	0.094	0.360
Sale_change	6999	0.341	12.199	-0.003	0.083	0.203
Assets	7007	6.998	1.556	5.897	6.840	7.926
Tobin Q	7004	2.239	2.110	1.289	1.664	2.418
Age	6578	55.245	7.472	50	55	60
Volatility	6895	0.123	0.171	0.068	0.098	0.144
Tenure	7007	7.130	3.534	4	7	9
Institutional Ownership	7002	0.631	0.206	0.503	0.645	0.773
G-index	5613	9.334	2.745	7	9	11
Competition	7007	0.226	0.167	0.104	0.180	0.293
Board Size	4436	9.286	2.367	8	9	11
Board Independence	4428	0.678	0.167	0.571	0.714	0.800

Table 2: **Industry Conditions before Tariff Shocks**

This table presents the industry mean and median of the main variables for manufacturing industries (SIC codes 2000-3999) that experience significant tariff changes between 1992 and 2005. The mean and median of each variable during three years before tariff changes are presented. P-values of Wilcoxon signed-rank and standard t-test are shown. For Panel B, the variables are demeaned by industry and year. Panel B reports the industry mean and median of the demeaned variables. All variables are defined in the appendix.

Panel A: Industry Mean and Median Before Tariff Changes

	Before Tariff Change					
	Mean		t-test	Median		Signrank
Variable	INCREASE	CUT	(p-value)	INCREASE	CUT	(p-value)
Assets	7.38	7.15	0.307	7.61	6.72	0.273
ROA	0.06	0.07	0.271	0.06	0.07	0.100
ROE	0.14	0.13	0.802	0.13	0.14	0.894
R&D	0.02	0.04	0.002	0.01	0.03	0.001
Tobin's Q	1.54	1.95	0.001	1.37	1.60	0.003
Sales	1.26	1.20	0.416	1.16	1.15	0.541
Competition	0.36	0.29	0.048	0.35	0.22	0.129

Panel B: Demeaned Industry Mean and Median before Tariff Changes

	Before Tariff Change					
	Mean		t-test	Median		Signrank
Variable	INCREASE	CUT	(p-value)	INCREASE	CUT	(p-value)
Assets	0.061	0.181	0.358	-0.011	0.039	0.784
ROA	-0.004	0.008	0.107	-0.005	0.001	0.361
ROE	-0.009	0.024	0.102	-0.017	0.015	0.136
R&D	-0.001	-0.004	0.588	-0.002	-0.004	0.394
Tobin's Q	-0.074	-0.032	0.617	-0.133	0.007	0.532
Sales	-0.065	-0.022	0.297	-0.061	0.004	0.196
Competition	-0.006	0.004	0.616	0.012	0.018	0.673

Table 3: **Firm Policies and Performance Around Tariff Changes**

This table presents the changes in the main variables around tariff changes. The sample consists of manufacturing firms (SIC codes 2000-3999) in the Compustat/ExecuComp/CRSP that experience significant tariff changes between 1992 and 2005. The mean and median of each variable during three years before and after tariff changes are presented. P-values of Wilcoxon signed-rank and standard t-test are shown. All variables are defined in the appendix.

Panel A: Mean and Median Around Tariff Cuts

	CUT					
	Mean		t-test	Median		Signrank
Variable	Before	After	(p-value)	Before	After	(p-value)
Assets	6.76	6.84	0.692	6.75	6.70	0.601
ROA	0.07	0.04	0.009	0.09	0.07	0.039
ROE	0.15	0.11	0.058	0.12	0.10	0.054
R&D	0.10	0.08	0.153	0.05	0.04	0.021
Tobin's Q	2.45	2.16	0.057	1.81	1.68	0.133
Sales	1.27	1.09	0.007	1.25	1.17	0.002
COGS	0.68	0.60	0.098	0.66	0.62	0.004
SPPE	0.01	0.02	0.075	0.00	0.00	0.101
SG&A	1.83	2.38	0.124	1.12	1.34	0.347
PPENT	0.32	0.28	0.056	0.28	0.26	0.109
Competition	0.19	0.23	0.014	0.15	0.18	0.000
Volatility	0.11	0.14	0.003	0.09	0.10	0.006

Panel B: Mean and Median Around Tariff Increases

	INCREASE					
	Mean		t-test	Median		Signrank
Variable	Before	After	(p-value)	Before	After	(p-value)
Assets	7.61	7.28	0.125	7.73	7.45	0.241
ROA	0.05	0.07	0.020	0.05	0.07	0.000
ROE	0.13	0.16	0.076	0.08	0.11	0.001
R&D	0.04	0.06	0.041	0.03	0.05	0.007
Tobin's Q	1.73	2.27	0.063	1.24	1.48	0.005
Sales	1.19	1.24	0.272	1.04	1.19	0.036
COGS	0.67	0.70	0.159	0.63	0.70	0.023
SPPE	0.02	0.02	0.285	0.01	0.02	0.000
SG&A	2.20	2.29	0.395	1.33	1.52	0.501
PPENT	0.32	0.27	0.064	0.23	0.24	0.859
Competition	0.22	0.23	0.554	0.13	0.16	0.000
Volatility	0.15	0.10	0.000	0.10	0.10	0.007

Table 4: **Tariff Shocks and CEO Turnover: statistics summary**

This table reports summaries of CEO turnover and tariff shocks in my sample. The sample consists of manufacturing firms (SIC codes 2000-3999) in the Compustat/ExecuComp/CRSP. CEO departure includes all turnovers: forced, voluntary, retirement, health-related, or etc. CEO turnover includes only turnovers where the CEO either is forced out or is younger than 65 and leaves for unspecified reasons. The sample period is between 1992 and 2005. All variables are defined in the appendix.

CEO Turnover and Tariff Changes by year

Year	CEO Departure	CEO Turnover	Tariff Cut	Tariff Increase
1992	9	4	5	2
1993	32	9	4	1
1994	48	14	4	3
1995	50	9	18	1
1996	50	11	3	0
1997	69	9	1	0
1998	55	5	7	1
1999	75	16	5	0
2000	84	10	1	5
2001	55	13	3	3
2002	64	8	3	3
2003	70	10	3	2
2004	74	14	0	2
2005	51	7	0	4
1992-2005	786	139	57	27

Table 5: **Competition Skill Indices: principal component analysis**

This table presents the results of principal component analyses for indices of high-competition and low-competition skill. Six aspects of a CEO's experience are used as proxies for high-competition skills: whether the CEO has experienced (1) a tariff cut, (2) a negative sales shock, and (3) high competition (Herfindahl-Hirschman index); (4) whether the CEO has engaged in asset sales; and (5-6) whether the CEO has worked in a firm with low-cost structures. Three proxies used for low-competition skills are (1) whether the CEO has experienced a tariff increase; and whether the CEO has worked in a firm (2) with high growth opportunities or (3) with high R&D expenses. All variables are defined in the appendix.

high-competition Index

	Tariff Cut	Sales Shock	Asset Sales	Competition	COGS	XSGA	Eigenvalue	Proportion explained
Loadings	0.042	0.483	-0.138	0.097	0.579	0.634	2.813	0.302

low-competition Index

	Tariff Increase	R&D	Tobin	Eigenvalue	Proportion explained
Loadings	0.017	0.707	0.707	1.400	0.467

Table 6: **CEO Characteristics**

This table presents descriptive statistics of CEO characteristics and experience. The sample consists of EXECUCOMP CEOs of manufacturing firms (SIC codes 2000-3999) whose prior experiences are available in Boardex. The sample period is between 1992 and 2005. Panel A reports CEO characteristics and experiences. Panel B reports the descriptive summary of CEOs' compensation. All variables are defined in the appendix.

Panel A: CEO Characteristics

Variables	Mean	Median	STD	MIN	Max	Observation
#Years in previous firms (Median)	7.6	6.25	4.8	1	29	1406
#Years in previous firms (Mean)	7.8	7	4.6	0.7	29	1406
#Positions	9.0	9	3.3	2	22	1430
#Firms	3.8	3	1.6	1	9	1430
#Industries	4.3	4	2.1	1	14	1430
CEO_dummy	0.3	0	0.5	0	1	1430
Conglomerate_dummy	0.3	0	0.4	0	1	1430
Ivy League	0.3	0	0.5	0	1	1431
MBA	0.4	0	0.5	0	1	1431
Female	0.0	0	0.1	0	1	1431
Chairman	0.7	1	0.4	0	1	1431
Founder	0.05	0	0.2	0	1	1431
Age	56.4	57	6.1	35	80	1361
Tenure	4.3	4	2.9	1	14	1491

Panel B: CEO Compensation

Variables	Mean	Median	STD	MIN	Max	Observation
Total Compensation	8.036	7.993	1.134	0.000	13.305	1421
Cash Compensation	6.961	7.016	0.995	0.000	10.681	1430
Salary	6.363	6.479	0.888	0.000	7.728	1430
Stock Compensation	1.913	0.000	3.122	0.000	11.222	1430
Equity Compensation	6.381	7.166	2.927	0.000	13.305	1430
Short_term Compensation	7.001	7.070	0.988	0.000	10.681	1430
Long_term Compensation	7.076	7.383	2.049	0.000	13.305	1421
Delta	5.546	5.528	1.422	0.000	10.107	1420
Vega	4.180	4.271	1.606	0.000	9.336	1427
Holding	0.016	0.003	0.047	0.000	0.440	1374

Table 7: **CEO Characteristics and Experience**

This table reports CEO characteristics and experience for CEOs with the skill sets relevant to tariff cuts and increases. The sample consists of EXECUCOMP CEOs of manufacturing firms (SIC codes 2000-3999) whose prior experiences are available in Boardex. The sample period is between 1992 and 2005. P-values of Wilcoxon signed-rank and standard t-test are shown. Panel A reports CEO characteristics and experiences. Panel B reports the descriptive summary of CEOs' compensation and their current firms' characteristics. All variables are defined in the appendix.

Panel A: CEO Characteristics and Experiences

	Mean		t-test	Median		Signrank
Variables	Exp_Cut	Exp_Increase	(p-value)	Exp_Cut	Exp_Increase	(p-value)
#Years in previous firms (Median)	7.84	6.02	0.001	6.00	5.00	0.018
#Years in previous firms (Mean)	8.07	6.07	0.000	6.00	5.00	0.003
#Positions	8.95	8.66	0.425	9.00	8.00	0.320
#Firms	3.17	3.81	0.000	3.00	4.00	0.000
#Industries	4.20	2.90	0.000	4.00	2.00	0.000
CEO_dummy	0.31	0.31	0.978	0.00	0.00	0.978
Conglomerate_dummy	0.27	0.12	0.001	0.00	0.00	0.002
Ivy League	0.27	0.26	0.937	0.00	0.00	0.937
MBA	0.39	0.40	0.771	0.00	0.00	0.771
Female	0.00	0.01	0.100	0.00	0.00	0.100
Chairman	0.67	0.60	0.243	1.00	1.00	0.242
Founder	0.04	0.12	0.006	0.00	0.00	0.013
Age	55.08	55.22	0.851	55.00	56.00	0.916
Tenure	4.01	4.36	0.277	3.00	4.00	0.274
Holding	0.015	0.010	0.283	0.002	0.003	0.280

Panel B: CEO Compensation and CEO Experience

Total Compensation	8.23	8.05	0.065	8.19	8.03	0.230
Cash Compensation	7.06	6.87	0.032	6.97	6.87	0.046
Salary	6.46	6.34	0.024	6.48	6.32	0.024
Stock Compensation	1.72	2.11	0.261	0.00	0.00	0.264
Equity Compensation	6.73	6.95	0.486	7.51	7.57	0.911
Short_term Compensation	7.10	6.90	0.024	7.05	6.88	0.031
Long_term Compensation	7.34	7.30	0.875	7.76	7.64	0.642
Delta	5.71	5.46	0.109	5.80	5.59	0.088
Vega	4.30	4.24	0.743	4.57	4.36	0.463

Panel C: Firm Characteristics and CEO Experience

	Mean		t-test	Median		Signrank
Variables	Exp_Cut	Exp_Increase	(p-value)	Exp_Cut	Exp_Increase	(p-value)
Assets	7.50	7.09	0.020	7.55	6.91	0.015
ROA	0.04	0.02	0.108	0.05	0.04	0.219
ROE	0.08	0.06	0.406	0.12	0.10	0.295
R&D	0.09	0.10	0.479	0.07	0.07	0.551
Tobin	2.45	2.34	0.543	1.85	1.85	0.801
Sale	0.88	0.76	0.012	0.84	0.77	0.037
COGS	0.58	0.69	0.090	0.56	0.66	0.039
SPPE	0.03	0.02	0.211	0.00	0.00	0.357
XSGA	5.47	2.07	0.224	1.28	1.48	0.235
PPENT	0.24	0.21	0.053	0.21	0.17	0.048
Competition	0.15	0.17	0.025	0.12	0.14	0.085
Volatility	0.14	0.13	0.386	0.11	0.12	0.463

Table 8: **Tariff Shocks and CEO Turnover**

This table presents the difference in difference estimates for the changes in CEO turnover following changes of import tariffs. The dependent variable equals 1 if the CEO either is forced out or leaves the firm for unspecified reasons and is younger than 65 years, and 0 otherwise. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables are lagged and include industry-adjusted return on assets, industry-adjusted buy and hold returns, changes in sales, Tobin's Q, volatility, competition, age dummy, CEO tenure and Institutional Ownership. Governance control variables include G-index, Board Size, and Board Independence. All variables are defined in the appendix. In Columns 4-6, the event year observations are excluded. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cut	0.0468***	0.0489***	0.0499***	0.0518***	0.0538***	0.0484***	0.0487***	0.0495***	0.0564***
	(5.16)	(4.23)	(3.48)	(5.49)	(4.92)	(3.42)	(5.52)	(5.05)	(4.01)
Increase	0.0454**	0.0432*	0.0472***	0.0480**	0.0454	0.0657**	0.0499***	0.0520**	0.0473*
	(2.22)	(1.73)	(2.70)	(2.20)	(1.54)	(2.49)	(2.90)	(2.49)	(1.91)
Controls		Y	Y		Y	Y		Y	Y
Governance Controls			Y			Y			Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y			
Industry#Year FE							Y	Y	Y
Observation	6915	5595	3564	6622	5337	3427	6910	5587	3559
R-squared	0.178	0.179	0.204	0.188	0.185	0.201	0.212	0.222	0.242

Table 9: **CEO Experience and CEO Turnover**

This table presents the triple difference estimates for the changes in CEO turnover following changes of import tariffs. The dependent variable equals 1 if the CEO either is forced out or leaves the firm for unspecified reasons and is younger than 65 years, and 0 otherwise. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). Exp_cut (Exp_Increase) is a dummy variable equal to 1 if the CEO has experience relevant to tariff cuts (increases) and 0 otherwise. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables are lagged and include industry-adjusted return on assets, industry-adjusted buy and hold returns, changes in sales, Tobin's Q, volatility, competition, age dummy, CEO tenure and Institutional Ownership. Governance control variables include G-index, Board Size, and Board Independence. All variables are defined in the appendix. In Columns 4-6, the event year observations are excluded. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cut * Exp_Cut	-0.109***	-0.145***	-0.151***	-0.151***	-0.215***	-0.218***	-0.116***	-0.145***	-0.150***
	(-3.49)	(-7.74)	(-4.63)	(-3.32)	(-10.92)	(-8.41)	(-3.96)	(-7.63)	(-5.10)
Increase * Exp_Increase	-0.160***	-0.119***	-0.212***	-0.0586**	-0.0566	-0.0605	-0.138***	-0.102***	-0.135*
	(-4.58)	(-4.63)	(-3.09)	(-2.25)	(-1.60)	(-0.87)	(-2.71)	(-2.72)	(-1.93)
Cut	0.212***	0.272***	0.197***	0.259***	0.351***	0.242***	0.210***	0.267***	0.195***
	(3.23)	(4.31)	(2.78)	(3.05)	(4.88)	(4.71)	(3.39)	(4.24)	(3.33)
Cut * Exp_Increase	-0.0895*	-0.112**	-0.0205	-0.0897*	-0.119*	0.00404	-0.0877**	-0.116**	-0.0332
	(-1.96)	(-2.01)	(-0.42)	(-1.73)	(-1.82)	(0.10)	(-2.07)	(-2.21)	(-0.85)
Increase	0.173***	0.138***	0.157**	0.0457*	0.0333	-0.00153	0.181***	0.133***	0.132**
	(4.43)	(3.80)	(2.36)	(1.82)	(0.59)	(-0.03)	(3.84)	(2.84)	(2.06)
Increase * Exp_Cut	0.0579***	0.0488**	0.124***	0.106***	0.137**	0.176***	0.0594**	0.0733***	0.123***
	(2.95)	(2.10)	(3.07)	(2.92)	(2.62)	(3.29)	(2.49)	(2.93)	(3.59)
Exp_Cut	-0.0225	-0.0227	-0.0273	-0.0226	-0.0217	-0.0257	-0.0189	-0.0176	-0.0191
	(-1.34)	(-1.28)	(-0.84)	(-1.28)	(-1.18)	(-0.77)	(-0.93)	(-0.71)	(-0.47)
Exp_Increase	-0.000315	-0.00203	0.0115	-0.00280	-0.00494	0.00879	-0.00249	0.000753	0.0112
	(-0.01)	(-0.06)	(0.22)	(-0.10)	(-0.15)	(0.16)	(-0.09)	(0.02)	(0.21)
Controls		Y	Y		Y	Y		Y	Y
Goveranance Controls			Y			Y			Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y			
Industry-Year FE							Y	Y	Y
R-squared	0.306	0.276	0.312	0.325	0.307	0.351	0.379	0.369	0.420
Observation	1528	1285	923	1459	1223	877	1473	1236	887

Table 10: **Tariff Shocks and Firms' Hiring Decisions**

This table presents the effect of tariff changes on firms' hiring decision. Skill dummies are created using 2-digit SIC codes. In Columns 1-2 and 4-5, the dependent variable is the portion of the CEOs with the relevant skill sets who work in the industry that experiences tariff changes. In Columns 3 and 6, the dependent variable is the difference in the first factor of the principal component analyses of the newly hired CEO and the old CEO. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). Exp_cut (Exp_Increase) is a dummy variable equal to 1 if the CEO has experience relevant to tariff cuts (increases) and 0 otherwise. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. All variables are defined in the appendix. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

	INCREASE_EXP			CUT_EXP		
	Composition		PCA	Composition		PCA
	(1)	(2)	(3)	(4)	(5)	(6)
CUT		0.158	-0.350**	0.100**	0.0904**	0.573***
		(0.69)	(-2.37)	(2.39)	(2.12)	(13.76)
INCREASE	0.150***	0.145***	0.243*		-0.116***	-2.626***
	(3.17)	(2.70)	(2.18)		(-2.99)	(-7.34)
Year FE	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y		Y	Y	

Table 11: **Tariff Shocks and CEO Turnover: magnitudes**

This table presents the difference in difference estimates for the changes in CEO turnover following changes of import tariffs. The dependent variable equals 1 if the CEO either is forced out or leaves the firm for unspecified reasons and is younger than 65 years, and 0 otherwise. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase) which is greater than 3 times In Columns 1-3 the median tariff cut(increase), small and large tariff changes are changes in import tariff that are 2 times (columns 4-6) and 4 times (columns 7-9) the median tariff change. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables are lagged and include industry-adjusted return on assets, industry-adjusted buy and hold returns, changes in sales, Tobin's Q, volatility, competition, age dummy, CEO tenure, and Institutional Ownership. Governance control variables include G-index, Board Size, and Board Independence. All variables are defined in the appendix. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

	$3 \times Median$			$2 \times Median$			$4 \times Median$		
	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cut	0.0468***	0.0489***	0.0499***	0.0106	0.00972	0.0278**	0.0489***	0.206***	0.211***
	(5.16)	(4.23)	(3.48)	(1.25)	(1.15)	(2.47)	(4.39)	(9.94)	(4.60)
Increase	0.0454**	0.0432*	0.0472***	0.0111	0.0207*	0.0287*	0.0659***	0.150**	0.217**
	(2.22)	(1.73)	(2.70)	(0.88)	(1.74)	(1.71)	(3.35)	(2.45)	(2.36)
Controls		Y	Y		Y	Y		Y	Y
Goveranance Controls			Y			Y			Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observation	6622	5595	3564	5542	4609	3533	6915	5010	3820
R-squared	0.178	0.179	0.204	0.168	0.171	0.199	0.190	0.209	0.236

Table 12: **Tariff Shocks and Firm Performance**

This table presents the difference in difference estimates for the changes in firm performance following changes of import tariffs. The dependent variable return on assets. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase) which is greater than 3 times in Columns 1-3 the median tariff cut(increase), small and large tariff changes are changes in import tariff that are 2 times (columns 4-6) and 4 times (columns 7-9) the median tariff change. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables are lagged and include industry-adjusted return on assets, industry-adjusted buy and hold returns, changes in sales, and Tobin's Q. All variables are defined in the appendix. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: Change in Return on Assets Following a Tariff Cut

	$3 \times Median$		$2 \times Median$		$4 \times Median$	
	ROA	ROA	ROA	ROA	ROA	ROA
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Cut	-0.0527***	-0.0706***	-0.00746	0.0159	-0.0669***	0.0802
	(-3.22)	(-3.67)	(-0.71)	(0.78)	(-3.38)	(0.30)
Cut * R&D		4.753***		0.376		2.003*
		(8.97)		(1.24)		(1.74)
Increase	0.0393*	0.0450***	0.0257***	0.0701***	0.0481***	0.0519***
	(1.93)	(4.90)	(3.11)	(4.09)	(4.93)	(5.91)
Increase * R&D		-0.770***		-1.560***		-1.154**
		(-10.28)		(-2.73)		(-2.56)
R&D	-0.0682**	-0.106*	0.117	0.379***	0.134**	0.324***
	(-2.02)	(-1.68)	(1.52)	(4.63)	(2.38)	(3.57)
Assets	-0.0523**	-0.0712***	-0.0537***	-0.0753***	-0.0587***	-0.0684***
	(-2.41)	(-6.47)	(-2.72)	(-7.55)	(-4.27)	(-6.06)
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observation	3612	3612	3043	3043	3981	3981
R-squared	0.601	0.602	0.614	0.629	0.592	0.603

Panel B: Change in Tobin's Q Following a Tariff Cut

	$3 \times Median$		$2 \times Median$		$4 \times Median$	
	Tobin	Tobin	Tobin	Tobin	Tobin	Tobin
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Cut	-0.984**	-0.511**	-0.184	-0.101	-1.212***	-0.564*
	(-2.61)	(-2.47)	(-1.05)	(-0.55)	(-2.81)	(-1.80)
Cut * R&D		-3.721***		-3.429		-3.608***
		(-10.45)		(-0.87)		(-7.14)
Increase	0.517***	0.249***	0.318**	0.166	0.560***	0.253**
	(3.79)	(2.80)	(2.19)	(1.38)	(3.76)	(2.57)
Increase * R&D		3.547***		1.894		2.153
		(3.21)		(0.83)		(1.07)
R&D	2.386**	2.773**	2.847***	3.055***	2.513**	2.992***
	(2.40)	(2.62)	(2.80)	(2.91)	(2.54)	(2.81)
Assets	-0.891***	-0.883***	-0.855***	-0.845***	-0.814***	-0.816***
	(-6.27)	(-6.28)	(-3.94)	(-3.92)	(-6.24)	(-6.28)
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observation	3612	3612	3043	3043	3981	3981
R-squared	0.619	0.623	0.669	0.671	0.619	0.623

Table 13: **Tariff Shocks and CEO Turnover: entrenchment**

This table presents the estimates for the changes in CEO turnover following changes of import tariffs. The dependent variable equals 1 if the CEO either is forced out or leaves the firm for unspecified reasons and is younger than 65 years, and 0 otherwise. *Cut* (*Increase*) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. *Family* is a dummy variables equal to 1 for CEOs who are related by blood or marriage to the founder or a large shareholder (Pérez-González, 2006). *Chairman* is a dummy variable equal to 1 if the CEO is also the chairman of the board. *CEO's Holding* is a dummy variable equal to 1 if the CEO's holding is above the industry mean. *Co-opt* is the fraction of the board who has been appointed after the incumbent CEO assumed office (Coles et al., 2014). Control variables are lagged and include firm size, industry-adjusted return on assets, changes in sales, Tobin's Q, volatility, competition, and government index. All variables are defined in the appendix. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

	Family		Chairman		CEO's Holding		Co-opt	
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cut	0.0458***	0.0465***	0.0661***	0.0687***	0.0409***	0.0423***	0.0495***	0.0487***
	(4.75)	(4.74)	(3.74)	(4.14)	(3.97)	(3.47)	(2.87)	(2.69)
Increase	0.0464***	0.0380**	0.0469**	0.0357	0.0601***	0.0498***	0.0126	0.0125
	(3.37)	(2.37)	(2.31)	(1.49)	(4.20)	(2.72)	(1.44)	(1.04)
Entrechment	-0.0131***	-0.0101	-0.00918**	-0.00957**	-0.00938***	-0.00882**	-0.00793**	-0.00872**
	(-2.77)	(-1.58)	(-2.12)	(-2.07)	(-3.03)	(-2.38)	(-2.01)	(-2.26)
Cut * Entrechment	-0.0380***	-0.0296***	-0.0284	-0.0291	0.00172	0.00628	-0.0300**	-0.0305**
	(-3.57)	(-3.10)	(-1.41)	(-1.45)	(0.08)	(0.30)	(-2.30)	(-2.45)
Increase * Entrechment	-0.0434***	-0.0220*	-0.000594	0.00439	-0.0351**	-0.0350**	-0.0581**	-0.0596**
	(-2.83)	(-1.71)	(-0.03)	(0.24)	(-2.28)	(-2.11)	(-2.53)	(-2.57)
Control	Y	Y	Y	Y	Y	Y	Y	Y
Industry Fixed Effects	N	Y	N	Y	N	Y	N	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
N	4858	4858	4669	4669	4189	4189	3166	3165
R-squared	0.021	0.038	0.024	0.041	0.024	0.042	0.026	0.050

Table 14: **CEO Experience and Firm Performance**

This table presents the triple difference estimates for the changes in firm performance following changes of import tariffs. In Panel A, the dependent variable is return on assets. In Panel B, the dependent variable is Tobin's Q. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). Exp_cut (Exp_Increase) is a dummy variable equal to 1 if the CEO has experience relevant to tariff cuts (increases) and 0 otherwise. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. All variables are defined in the appendix. In Columns 4-6, the event year observations are excluded. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: The Effect of Experience on Return on Assets

	ROA	ROA	ROA	ROA	ROA	ROA	ROA
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cut * Exp_Cut	0.0965***	0.0430***	0.103***	0.0123**	0.107***	0.0355*	0.0181**
	(2.67)	(2.97)	(5.74)	(2.40)	(4.45)	(2.03)	(2.58)
Cut	-0.0237	-0.0289*	-0.091***	-0.00807***	-0.0288	-0.0344*	-0.0665***
	(-0.98)	(-1.89)	(-3.26)	(-4.87)	(-1.06)	(-1.69)	(-4.44)
Cut * Exp_Increase	-0.0554**	0.0114	-0.0619**	-0.0123	-0.0526**	0.0163	0.0236
	(-2.26)	(0.78)	(-2.64)	(-0.40)	(-2.57)	(1.12)	(1.45)
Increase	0.0181	0.00804	0.122***	0.0508*	0.119***	0.0466	0.0124
	(0.60)	(0.59)	(3.96)	(1.74)	(3.51)	(1.35)	(0.73)
Increase * Exp_Increase	-0.0559***	-0.0172	-0.0937***	-0.0347**	-0.0876***	-0.0316*	-0.0211
	(-3.00)	(-0.81)	(-5.35)	(-2.27)	(-4.79)	(-1.93)	(-1.52)
Increase * Exp_Cut	0.0215	0.00868	-0.0356	-0.0250	-0.0378	-0.0192	-0.0117
	(1.09)	(0.41)	(-0.88)	(-1.08)	(-0.85)	(-0.75)	(-0.48)
Exp_Cut	0.000724	-0.0114	0.00718	-0.00326	0.00759	-0.00348	-0.00968
	(0.05)	(-0.92)	(0.48)	(-0.27)	(0.50)	(-0.34)	(-0.93)
Exp_Increase	0.00605	-0.0111	-0.000171	-0.00438	0.00359	-0.00903	-0.0131
	(0.39)	(-0.84)	(-0.01)	(-0.61)	(0.25)	(-1.00)	(-1.31)
Assets			-0.0512	0.0121	-0.0497	0.00729	0.00871
			(-1.33)	(0.98)	(-1.36)	(0.83)	(0.95)
R&D					0.0611	-0.305	-0.377**
					(0.41)	(-1.45)	(-2.08)
Year FE	Y	Y	Y	Y	Y	Y	
Firm FE	Y		Y		Y		
Industry FE		Y		Y		Y	
Industry-Year FE							Y
Observation	1515	1568	1313	1374	1107	1163	986
R-squared	0.597	0.136	0.634	0.158	0.626	0.185	0.295

Panel B: The Effect of Experience on Tobin's Q

	Tobin	Tobin	Tobin	Tobin	Tobin	Tobin	Tobin
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cut * Exp_Cut	.5104***	0.938***	0.913**	1.019***	0.908***	1.006***	1.360***
	(3.87)	(5.90)	(2.37)	(6.05)	(3.22)	(5.56)	(4.19)
Increase * Exp_Increase	0.4120***	0.643***	1.010***	0.556***	0.917***	0.534***	0.410*
	(4.02)	(3.10)	(3.30)	(3.87)	(3.25)	(3.43)	(1.75)
Cut	-0.660***	-0.619**	-0.969***	-1.071***	0.156	-0.929***	-0.776***
	(-4.27)	(-2.18)	(-3.51)	(-6.87)	(0.50)	(-5.57)	(-3.79)
Cut * Exp_Increase	0.415	0.485**	-0.328	0.207	-0.759*	-0.242	-0.288
	(1.47)	(2.27)	(-0.95)	(1.03)	(-1.86)	(-1.35)	(-1.29)
Increase	0.187**	0.697***	0.302*	0.297	0.539	0.386	0.0412**
	(2.21)	(3.51)	(1.93)	(1.26)	(1.53)	(1.23)	(2.40)
Increase * Exp_Cut	-0.1280*	-0.287	0.0965	-0.217*	0.167	-0.104	-0.206
	(-1.69)	(-1.50)	(0.45)	(-1.72)	(0.85)	(-0.59)	(-1.12)
Exp_Cut	0.112	0.423***	-0.116	0.286**	-0.135	0.246	0.293
	(0.56)	(2.74)	(-0.67)	(2.16)	(-0.81)	(1.36)	(1.68)
Exp_Increase	0.107	-0.0495	0.0641	-0.0802	0.0689	0.0155	0.0709
	(0.49)	(-0.40)	(0.34)	(-0.52)	(0.32)	(0.08)	(0.30)
Assets			-1.194***	-0.0949**	-1.021***	0.0172	0.0337
			(-4.38)	(-2.13)	(-3.56)	(0.29)	(0.67)
R&D					2.833**	5.690***	5.149***
					(2.02)	(5.93)	(7.05)
Year FE	Y	Y	Y	Y	Y	Y	
Firm FE	Y		Y		Y		
Industry FE		Y		Y		Y	
Industry-Year FE							Y
Observation	1527	1579	1322	1382	1115	1170	993
R-squared	0.495	0.189	0.626	0.283	0.624	0.323	0.439

Table 15: **CEO Experience and Firm Performance: propensity score matching**

This table presents the difference in difference estimates for the changes in firm value and performance for firms that experience import tariff shocks but do not change their CEOs (Panel A and B) and those that change their CEOs (Panels C and D). The treated firms are firms run by a CEO with the relevant skill set. The matched firms are firms in the same industry that are run by a CEO without the relevant skills and have comparable size. The dependent variable is return on assets in Panels A and C and Tobin's Q in Panels B and D. In Columns 1-3, the differences between a year before the tariff change and 1, 2 or 3 following the tariff change are shown. In Column 4, the differences in the three-year average before and after the tariff change are presented. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). Exp_cut (Exp_Increase) is a dummy variable equal to 1 if the CEO has experience relevant to tariff cuts (increases) and 0 otherwise. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999) that experience a tariff change. The sample period is between 1992 and 2005. All variables are defined in the appendix. T-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: Change in Return on Assets for Firms that Retain their CEOs

	Tariff Cut			
	ROA	ROA	ROA	ROA
	2-year difference	3-year difference	4-year difference	3-year average
Variable	(1)	(2)	(3)	(4)
Exp_Cut	0.0479**	0.0674**	0.110***	0.0416***
	(2.22)	(2.21)	(3.64)	(2.90)
Exp_Increase	-0.0432	-0.209*	-0.0977*	-0.118
	(-0.33)	(-1.70)	(-1.67)	(-1.09)

Panel B: Change in Tobin's Q for Firms that Retain their CEOs

	Tariff Increase			
	Tobin	Tobin	Tobin	Tobin
	2-year difference	3-year difference	4-year difference	3-year average
Variable	(1)	(2)	(3)	(4)
Exp_Increase	0.388	1.506**	1.541***	0.872**
	(0.19)	(2.32)	(2.82)	(2.12)
Exp_Cut	-0.737	0.675	-1.949*	-0.811*
	(-0.46)	(1.59)	(-1.89)	(-1.68)

Panel C: Change in Return on Assets for Firms that Hire a new CEO

	Tariff Cut			
	ROA	ROA	ROA	ROA
	2-year difference	3-year difference	4-year difference	3-year average
Variable	(1)	(2)	(3)	(4)
Exp_Cut	0.048*	0.058**	0.063***	0.036**
	(1.76)	(2.06)	(4.24)	(2.43)
Exp_Increase	-0.0996	-0.159	-0.206**	-0.197
	(-1.07)	(-1.62)	(-2.09)	(-1.55)

Panel D: Change in Tobin's Q for Firms that Hire a new CEO

	Tariff Increase			
	Tobin	Tobin	Tobin	Tobin
	2-year difference	3-year difference	4-year difference	3-year average
Variable	(1)	(2)	(3)	(4)
Exp_Increase	0.320	0.608*	0.862**	0.421*
	(0.52)	(1.95)	(2.35)	(1.72)
Exp_Cut	0.408	0.490	-1.329*	-1.476
	(1.48)	(1.26)	(-1.93)	(-0.76)

Table 16: **CEO Experience and Firm Performance: tenure, and industry**

This table presents the difference in difference estimates for the changes in firm value and performance following import tariff shocks. The treatment group includes firms that have hired a CEO with the relevant skill set at least three years before the tariff shock and retain their CEOs for at least three years after the shock. The matched firms are those that retain their CEOs after tariff shocks, and that have hired a CEO who lacks the relevant skill at least three years before the shock (Panel A), or that have hired a CEO with the relevant skill right before the shock (Year 0 or Year -1) (Panel B), or that have hired a CEO with the relevant skill for at least three years but are in a different industry that does not experience a tariff shock (Panel C). The dependent variable is (industry-adjusted) return on assets and Tobin's Q in Panel A and B (Panel C). In Columns 1-3, the differences between a year before the tariff change and 1, 2 or 3 following the tariff change are shown. In Column 4, the differences in the three-year average before and after the tariff change are presented. *Cut* (*Increase*) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). *Exp_cut* (*Exp_Increase*) is a dummy variable equal to 1 if the CEO has experience relevant to tar-iff cuts (increases) and 0 otherwise. The sample comprises publicly traded, manufacturing firms(SIC codes 2000-3999) that experience a tariff change. The sample period is between 1992 and 2005. All variables are defined in the appendix. T-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: Firms that have hired their CEOs who lack the skill

	2-year difference	3-year difference	4-year difference	3-year average
Variable	(1)	(2)	(3)	(4)
	Change in ROA around Tariff Cut			
Exp_Cut	0.0732	0.122**	0.156**	0.0789**
	(1.00)	(2.32)	(2.00)	(2.00)
	Change in Tobin's Q around Tariff Increase			
Exp_Increase	0.0703	1.373***	1.230*	2.208
	(0.36)	(15.90)	(1.75)	(1.14)

Panel B: Firms that have hired their CEOs right before shocks

	2-year difference	3-year difference	4-year difference	3-year average
Variable	(1)	(2)	(3)	(4)
			Change in ROA around Tariff Cut	
Exp_Cut	0.105**	0.0573**	0.0163**	-0.0157
	(2.00)	(2.00)	(2.00)	(-0.43)
			Change in Tobin's Q around Tariff Increase	
Exp_Increase	0.783***	0.895***	1.184	1.018
	(4.62)	(2.91)	(1.56)	(1.46)

Panel C: Firms that have hired their CEOs with relevant skills in an industry that doesn't experience a tariff shock

	2-year difference	3-year difference	4-year difference	3-year average
Variable	(1)	(2)	(3)	(4)
			Change in ROA around Tariff Cut	
Exp_Cut	0.0069	0.0143*	0.0240***	0.0171**
	(0.50)	(1.87)	(3.58)	(2.33)
			Change in Tobin's Q around Tariff Increase	
Exp_Increase	-0.0399	0.646	0.344*	0.169***
	(-0.21)	(0.81)	(1.66)	(3.81)

Table 17: **CEO Experience and Firm Performance: instrumental variable**

This table presents the difference in difference estimates for the changes in firm performance following changes of import tariffs using an instrumental variable setting. Panel A reports the results from the Probit model of whether the CEO has experience relevant to high or low competition. Family is a dummy variable equal to 1 if the firm is a family firm. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase) which is greater than 3 times the median tariff cut(increase). Column 1 and 3 report the results from the Probit model, while column 2 and 4 report the marginal effects. Panel B presents the results from the second stage model. The measures of performance are return on assets and Tobin's Q. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables are lagged. All variables are defined in the appendix. Standard errors are clustered by industry, and z-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: Instrumental Variable: First Stage Regression

	Exp_cut		Exp_Inc	
	Probit	Marginal Effects	Probit	Marginal Effects
Variable	(1)	(2)	(3)	(4)
Family	-2.492***	-0.497***	-2.947***	-0.548***
	(-8.06)	(-6.88)	(-10.83)	(-8.75)
Cut	0.329*	0.0594*	-0.234	-0.0422
	(1.74)	(1.72)	(-1.56)	(-1.55)
Increase	-0.202	-0.0327	0.272**	0.0486*
	(-1.13)	(-1.13)	(1.97)	(1.94)
Assets	0.106**	0.0171**	-0.0983*	-0.0157*
	(2.38)	(2.44)	(-1.91)	(-1.91)
Competition	0.620	0.112	-1.695	-0.291
	(0.48)	(0.48)	(-1.24)	(-1.25)
CEO Holding	-1.515***	-0.274***	-3.840*	-0.659*
	(-3.10)	(-3.09)	(-1.68)	(-1.68)
Tenure	-0.0637**	-0.0115**	0.0158	0.00286
	(-2.42)	(-2.46)	(0.83)	(0.83)
Chairman	0.152	0.0274	-0.0875	-0.0150
	(1.34)	(1.34)	(-0.51)	(-0.51)
Control	Y	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
N	1213	1213	1327	1327
F-Statistics	63.87		22.79	
P-Value	0.000		0.000	

Panel B: Change in Tobin's Q Following a Tariff Cut (Second Stage)

	ROA	Tobin's Q
Variable	(1)	(2)
Cut * Exp_Cut	0.310**	3.024*
	(2.22)	(1.74)
Cut	-0.0351**	-0.0817***
	(-2.23)	(-3.20)
Cut * Exp_Increase	0.673	1.799
	(0.58)	(0.31)
Increase * Exp_Increase	1.085	9.116**
	(1.48)	(2.53)
Increase	0.0433**	0.141**
	(2.12)	(2.35)
Increase * Exp_Cut	-1.012	-12.09
	(-1.33)	(-0.44)
Exp_Cut	0.0209	0.150
	(0.05)	(0.05)
Exp_Increase	-3.798	-1.919
	(-0.33)	(-0.21)
Control	Y	Y
Industry Fixed Effects	Y	Y
Year Fixed Effects	Y	Y
N	1075	1082

Table 18: **Tariff Shocks and CEO Compensation: univariate test**

This table presents changes in CEO compensation following changes of import tariffs for firms that did not change their CEOs. Tariff Cut (Increase) are the first three years after a tariff cut (increase) which is greater than 3 times the median tariff cut (increase), The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Panel A and B show the results for changes in mean and median of CEO compensation following a tariff cut and increase respectively. Panel C and D show the results for industry-adjusted estimates (residuals of regressing compensation variables on industry fixed-effects). All variables are defined in the appendix. Standard errors are clustered by industry

Panel A: The effect of tariff cuts on CEO compensation

	Tariff Cut					
	Mean		t-test	Median		Singrank
Variable	Before	After	(p-value)	Before	After	(p-value)
Stock	0.847	1.256	0.016	0	0	0.012
Option	5.156	5.545	0.078	6.184	6.477	0.005
Equity	5.236	5.799	0.009	6.322	6.630	0.001
Salary	6.266	6.274	0.885	6.266	6.312	0.058
Cash	6.752	6.783	0.627	6.714	6.815	0.094
Bonus	4.989	4.794	0.276	5.784	5.922	0.763
Total Compensation	7.502	7.781	0.000	7.384	7.610	0.000
Delta	817.9	686.2	0.537	185.4	209.5	0.220
Vega	62.33	121.23	0.000	28.22	37.88	0.001
Short_term	6.801	6.857	0.320	6.766	6.853	0.093
Long_term	6.080	6.643	0.000	6.521	6.827	0.000
Equity/Total Compensation	0.361	0.433	0.000	0.369	0.453	0.001

Panel B: The effect of tariff increases on CEO compensation

	Tariff Increase					
	Mean		t-test	Median		Singrank
Variable	Before	After	(p-value)	Before	After	(p-value)
Stock	1.620	1.682	0.785	0	0	0.884
Option	6.529	5.306	0.000	7.048	6.432	0.000
Equity	6.762	5.628	0.000	7.209	6.588	0.000
Salary	6.205	6.194	0.901	6.434	6.369	0.037
Cash	6.844	6.823	0.830	6.984	6.824	0.188
Bonus	5.091	5.177	0.674	6.065	5.928	0.924
Total Compensation	8.214	7.683	0.000	8.125	7.698	0.000
Delta	1872.7	774.5	0.026	211.3	189.9	0.201
Vega	260.4	141.3	0.001	75.68	44.73	0.000
Short_term	6.877	6.847	0.754	7.015	6.846	0.169
Long_term	7.398	6.401	0.000	7.529	6.858	0.000
Equity/Total Compensation	0.508	0.389	0.000	0.499	0.385	0.000

Panel C: The effect of tariff cuts on industry-adjusted CEO compensation

	Tariff Cut					
	Mean		t-test	Median		Singrank
Variable	Before	After	(p-value)	Before	After	(p-value)
Stock	-0.531	-0.170	0.030	-1.047	-1.047	0.023
Option	-0.309	0.261	0.006	0.664	1.188	0.000
Equity	-0.527	0.174	0.001	0.339	0.974	0.000
Salary	-0.076	-0.071	0.931	-0.055	-0.025	0.070
Cash	-0.113	-0.083	0.631	-0.139	-0.029	0.086
Bonus	-0.060	-0.151	0.594	0.630	0.705	0.794
Total Compensation	-0.280	0.030	0.000	-0.338	-0.024	0.000
Delta	-18.19	4.998	0.890	-175.3	-139.2	0.025
Vega	-73.00	-11.41	0.000	-70.53	-51.37	0.000
Short_term	-0.105	-0.057	0.360	-0.145	-0.039	0.097
Long_term	-0.513	0.142	0.000	-0.109	0.370	0.000
Equity/Total Compensation	-0.058	0.030	0.000	-0.050	0.040	0.000

Panel D: The effect of tariff increases on industry-adjusted CEO compensation

	Tariff Increase					
	Mean		t-test	Median		Singrank
Variable	Before	After	(p-value)	Before	After	(p-value)
Stock	-0.065	0.063	0.552	-0.892	-0.892	0.530
Option	0.863	-0.226	0.000	1.364	0.731	0.000
Equity	0.744	-0.302	0.000	1.251	0.705	0.000
Salary	-0.041	0.022	0.381	0.063	0.085	0.711
Cash	-0.013	0.055	0.410	0.021	0.039	0.511
Bonus	-0.011	0.235	0.200	0.613	0.896	0.083
Total Compensation	0.306	-0.139	0.000	0.222	-0.081	0.000
Delta	666.7	-382.9	0.031	-368.9	-257.1	0.886
Vega	74.97	-24.15	0.006	-52.99	-64.40	0.097
Short_term	-0.007	0.032	0.637	0.041	0.015	0.860
Long_term	0.587	-0.301	0.000	0.746	0.219	0.000
Equity/Total Compensation	0.074	-0.030	0.000	0.099	-0.026	0.000

Table 19: **Tariff Shocks and CEO Compensation: multivariate analyses**

This table presents the changes in CEO compensation following changes of import tariffs for firms that did not change their CEOs. The dependent variables are total or components of CEO compensation. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase) which is greater than 3 times the median tariff cut (increase), The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables include CEO age, tenure, return on assets, and firm size. Panel A and B show the estimates for models with firm fixed effects, while Panel C and D show for models with industry fixed effects. All variables are defined in the appendix and lagged one year. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: The effect of tariff shocks on CEO compensation: firm fixed effects

	Total	Salary	Bonus	Cash	Option	Stock	Equity	Delta	Vega	Short-term	Long-term
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Cut	0.121***	-0.0266	-0.117	-0.0323	0.256*	0.169	0.283**	15.36	18.60*	-0.0128	0.302***
	(3.10)	(-0.49)	(-0.82)	(-0.49)	(1.77)	(1.25)	(2.07)	(0.15)	(1.68)	(-0.21)	(3.26)
Increase	-0.158**	0.0397	0.180	0.0659	-0.0907	0.153	-0.138	-537.8	-27.51	0.0270	-0.288**
	(-2.08)	(0.84)	(1.28)	(1.09)	(-0.45)	(0.79)	(-0.76)	(-1.32)	(-1.07)	(0.55)	(-2.33)
Control	N	N	N	N	N	N	N	N	N	N	N
Firm Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	6404	6457	6457	6457	6404	6457	6457	6387	6435	6457	6404

Panel B: The effect of tariff shocks on CEO compensation: firm fixed effects and controls

	Total	Salary	Bonus	Cash	Option	Stock	Equity	Delta	Vega	Short-term	Long-term
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Cut	0.140***	-0.0448	-0.128	-0.0619	0.318**	0.157	0.354**	-315.4	-13.87	0.0511	-0.234*
	(3.28)	(-0.68)	(-0.82)	(-0.77)	(2.01)	(1.01)	(2.43)	(-1.06)	(-0.70)	(0.72)	(-1.76)
Increase	-0.106	0.0684	0.250	0.0979	0.00144	0.182	0.0181	201.5	67.38***	0.0870**	0.338***
	(-1.41)	(1.29)	(1.49)	(1.15)	(0.01)	(0.82)	(0.09)	(1.50)	(3.09)	(2.51)	(3.77)
Control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	5345	5369	5369	5369	5345	5369	5369	5328	5360	5369	5345

Panel C: The effect of tariff shocks on CEO compensation: industry fixed effects

Variable	Total (1)	Salary (2)	Bonus (3)	Cash (4)	Option (5)	Stock (6)	Equity (7)	Delta (8)	Vega (9)	Short-term (10)	Long-term (11)
Cut	0.123**	-0.0550	-0.143	-0.0618	0.361***	0.131	0.345***	9.283	12.98	-0.0143	0.340***
	(2.18)	(-0.87)	(-0.68)	(-0.81)	(3.33)	(1.09)	(2.76)	(0.11)	(1.59)	(-0.22)	(3.89)
Increase	-0.116	0.0805***	0.264*	0.131***	-0.107	0.0162	-0.256	-445.7	-20.08	0.0920**	-0.316
	(-0.84)	(2.69)	(1.91)	(2.99)	(-0.42)	(0.08)	(-1.02)	(-0.97)	(-0.71)	(2.35)	(-1.51)
Control	N	N	N	N	N	N	N	N	N	N	N
Industry Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	6475	6528	6528	6528	6475	6528	6528	6460	6508	6528	6475

Panel D: The effect of tariff shocks on CEO compensation: industry fixed effects and controls

Variable	Total (1)	Salary (2)	Bonus (3)	Cash (4)	Option (5)	Stock (6)	Equity (7)	Delta (8)	Vega (9)	Short-term (10)	Long-term (11)
Cut	0.143***	-0.0679	-0.239	-0.0897	0.466***	0.177	0.434***	11.42	10.01	-0.0212	0.384***
	(2.90)	(-0.82)	(-1.08)	(-0.93)	(3.60)	(1.47)	(3.01)	(0.13)	(0.80)	(-0.26)	(3.62)
Increase	-0.0270	0.0758**	0.350**	0.137***	0.0416	0.0325	-0.0560	-215.8	-4.789	0.0960**	-0.182
	(-0.34)	(2.29)	(2.51)	(3.04)	(0.17)	(0.16)	(-0.39)	(-0.95)	(-0.28)	(2.50)	(-1.59)
Control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	5327	5351	5351	5351	5327	5351	5351	5310	5343	5351	5327

Table 20: **Tariff Shocks and CEO Pay-for-Performance**

This table presents the difference in difference and triple difference estimates for the changes in CEO compensation following changes of import tariffs. The dependent variable is total compensation in Columns 1-4, long_term compensation in Columns 5-6 and short_term compensation in Columns 7-8. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase) which is greater than 3 times the median tariff cut (increase), The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables include institutional holdings, CEO tenure, and G-Index. All variables are defined in the appendix. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

	Total	Total	Total	Total	Long_term	Long_term	Short_term	Short_term
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CUT	0.137**	0.130**	0.0311	0.197***	-0.00308	0.301	0.0379	0.0536
	(2.20)	(2.07)	(0.49)	(3.01)	(-0.01)	(0.48)	(0.29)	(0.41)
CUT * ST Performance			-0.0436***	-0.049***	-0.285**	-0.282*	-0.0346	0.0368
			(-3.93)	(-3.65)	(-2.36)	(-1.79)	(-0.17)	(0.19)
CUT * LT Performance			0.0349***	-0.0136	0.201**	0.159	-0.0393***	-0.0405***
			(2.67)	(-0.82)	(2.05)	(1.20)	(-3.04)	(-3.08)
Increase	-0.0945	-0.12	0.0962	0.185***	1.684**	1.399	-0.0913	-0.163
	(-0.83)	(-0.96)	(1.08)	(3.21)	(2.59)	(1.46)	(-0.54)	(-1.22)
Increase * ST Performance			1.536**	1.888***	0.411**	0.413**	-1.218***	-0.794***
			(2.59)	(2.7)	(2.35)	(2.32)	(-4.31)	(-3.24)
Increase * LT Performance			-0.235***	-0.342***	-0.504***	-0.482***	0.118*	0.126**
			(-2.89)	(-7.66)	(-2.85)	(-2.63)	(1.75)	(2.52)
ST Performance			0.0720**	0.0900***	0.0814	0.0911	0.0593	0.0327
			(2.56)	(3.76)	(1.08)	(1.02)	(0.64)	(0.33)
LT Performance			0.0531***	0.125***	0.453***	0.337***	0.0395***	0.0427***
			(2.84)	(8.28)	(4.69)	(3.21)	(3.79)	(4.21)
Assets	0.190***	0.199***	0.228***	0.253***	-0.138	-0.234	0.0958**	0.114***
	(4.32)	(3.32)	(6.18)	(6.07)	(-0.75)	(-1.03)	(2.18)	(2.83)
Control		Y		Y		Y		Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observation	6458	4299	5381	4267	5381	4267	5381	4267

Table 21: **Tariff Shocks and CEO Compensation: financial constraints**

This table presents the changes in CEO compensation following changes of import tariffs for firms that did not change their CEOs and struggle financially. The dependent variables are total or components of CEO compensation. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase) which is greater than 3 times the median tariff cut (increase). Firms are considered financial constrained if they are ranked in the top tercile based on their KZ-index (Kaplan and Zingales, 1997) and WW-index (Whited and Wu, 2006); are a non-dividend payer, or have Altman-z scores below 1.8. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables include CEO age, tenure, return on assets, and firm size. All models include control variables, year and industry fixed effects. Panel A and B show the estimates for models with firm fixed effects, while Panel C and D show for models with industry fixed effects. All variables are defined in the appendix and lagged one year. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: KZ-index

	Total	Salary	Bonus	Cash	Option	Stock	Equity	Delta	Vega	Short-term	Long-term
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Cut * Constraint	0.326***	-0.181	0.250	0.0123	0.643	0.333	0.498	206.8	46.36**	0.190**	0.540**
	(3.94)	(-0.78)	(0.61)	(0.05)	(1.35)	(0.53)	(1.01)	(1.46)	(1.99)	(2.01)	(2.24)
Increase * Constraint	0.164	-0.173**	0.299	0.0119	-0.0812	-1.387***	-0.394	625.8**	-29.63	0.0738	-0.0985
	(1.06)	(-2.07)	(0.98)	(0.09)	(-0.14)	(-3.29)	(-0.74)	(2.41)	(-0.95)	(0.52)	(-0.27)
N	5348	5373	5373	5373	5348	5373	5373	5331	5364	5373	5348
R-squared	0.467	0.271	0.214	0.372	0.200	0.172	0.218	0.217	0.265	0.431	0.308

Panel B: WW-index

	Total	Salary	Bonus	Cash	Option	Stock	Equity	Delta	Vega	Short-term	Long-term
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Cut * Constraint	0.168***	-0.201**	-0.774**	-0.278***	0.151	0.344	0.203	-6.143	-17.65	0.219**	0.331**
	(2.69)	(-2.12)	(-2.39)	(-2.80)	(0.67)	(1.64)	(0.87)	(-0.04)	(-1.08)	(2.46)	(2.16)
Increase * Constraint	-0.233***	0.508***	-0.171	0.321***	0.329	-0.791***	-0.0562	-985.9***	-96.50***	0.318***	-0.142
	(-2.67)	(12.12)	(-0.93)	(6.69)	(1.45)	(-4.94)	(-0.25)	(-3.70)	(-4.53)	(6.00)	(-0.84)
N	5348	5373	5373	5373	5348	5373	5373	5331	5364	5373	5348
R-squared	0.466	0.271	0.213	0.372	0.197	0.170	0.214	0.217	0.262	0.431	0.306

Panel C: non-dividend payer

	Total	Salary	Bonus	Cash	Option	Stock	Equity	Delta	Vega	Short-term	Long-term
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Cut * Constraint	0.316***	-0.0164	-0.622*	0.122	0.583*	0.307	0.474	23.63	5.150	0.193*	0.564**
	(3.80)	(-0.11)	(-1.66)	(0.79)	(1.71)	(1.09)	(1.43)	(0.16)	(0.26)	(1.80)	(2.58)
Increase * Constraint	-0.381***	-0.0769	0.225	-0.0994	-0.380	-0.392	-0.466*	-800.7**	-28.18	-0.0902	-0.751***
	(-2.93)	(-1.14)	(0.56)	(-0.79)	(-0.99)	(-0.97)	(-1.68)	(-2.37)	(-1.57)	(-0.76)	(-3.45)
N	5360	5385	5385	5385	5360	5385	5385	5343	5376	5385	5360
R-squared	0.473	0.271	0.213	0.372	0.201	0.172	0.217	0.218	0.262	0.432	0.310

Panel D: Altman-Z score

	Total	Salary	Bonus	Cash	Option	Stock	Equity	Delta	Vega	Short-term	Long-term
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Cut * Constraint	0.220***	-0.0486	0.617*	0.0655	0.996***	0.414	1.033***	334.8	49.42**	0.258**	0.682***
	(2.64)	(-0.24)	(1.76)	(0.26)	(2.89)	(1.10)	(3.47)	(1.61)	(2.28)	(2.36)	(3.94)
Increase * Constraint	-0.197	0.170	0.593*	0.187	-0.0404	-0.725*	-0.341	196.3	-83.15***	0.147	-0.408
	(-1.31)	(1.34)	(1.68)	(1.54)	(-0.07)	(-1.81)	(-0.65)	(0.92)	(-2.89)	(1.29)	(-1.24)
N	5360	5385	5385	5385	5360	5385	5385	5343	5376	5385	5360
R-squared	0.471	0.272	0.236	0.380	0.198	0.170	0.216	0.221	0.267	0.437	0.308

Table 22: **Tariff Shocks and Composition of CEO Compensation: financial constraints**

This table presents the changes in composition of CEO compensation following changes of import tariffs for firms that did not change their CEOs and struggle financially. The dependent variables are components of CEO compensation as a percentage of total compensation. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase) which is greater than 3 times the median tariff cut (increase). Firms are considered financial constrained if they are ranked in the top tercile based on their KZ-index (Kaplan and Zingales, 1997) and WW-index (Whited and Wu, 2006); are a non-dividend payer, or have Altman-z scores below 1.8. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables include CEO age, tenure, return on assets, and firm size. All models include control variables, year and industry fixed effects. Panel A and B show the estimates for models with firm fixed effects, while Panel C and D show for models with industry fixed effects. All variables are defined in the appendix and lagged one year. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: KZ-index

	Salary	Bonus	Cash	Option	Stock	Equity	Short-term	Long-term
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cut * Constraint	-0.111***	0.0297	-0.0814**	0.0711	-0.000272	0.0708*	-0.0894**	0.0894**
	(-5.50)	(0.93)	(-2.31)	(1.57)	(-0.01)	(1.81)	(-2.61)	(2.61)
Increase * Constraint	-0.0807***	0.0598*	-0.0208	0.0608	-0.0466**	0.0143	-0.00653	0.00653
	(-4.16)	(1.76)	(-0.47)	(1.20)	(-2.48)	(0.27)	(-0.14)	(0.14)
N	5344	5344	5344	5344	5344	5344	5344	5344
R-squared	0.257	0.162	0.238	0.233	0.126	0.222	0.236	0.236

Panel B: WW-index

	Salary	Bonus	Cash	Option	Stock	Equity	Short-term	Long-term
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cut * Constraint	-0.0513***	-0.0249*	-0.0264	-0.00875	0.0274***	0.0187	-0.0265	0.0265
	(-3.87)	(-1.71)	(-1.29)	(-0.37)	(2.92)	(0.80)	(-1.28)	(1.28)
Increase * Constraint	0.114***	-0.0465***	0.0676***	-0.0160	-0.0329***	-0.0489**	0.0598***	-0.0598***
	(8.51)	(-2.97)	(3.10)	(-0.80)	(-4.04)	(-2.37)	(2.70)	(-2.70)
N	5344	5344	5344	5344	5344	5344	5344	5344
R-squared	0.254	0.161	0.237	0.231	0.126	0.220	0.234	0.234

Panel C: non-dividend payer

	Salary	Bonus	Cash	Option	Stock	Equity	Short-term	Long-term
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cut * Constraint	-0.0879***	-0.00200	-0.0859***	0.0601**	0.0173	0.0774***	-0.0918***	0.0918***
	(-3.61)	(-0.11)	(-3.17)	(2.28)	(1.26)	(3.06)	(-3.50)	(3.50)
Increase * Constraint	0.0694*	0.00960	0.0790***	-0.0187	-0.0132	-0.0319	0.0752***	-0.0752***
	(1.87)	(0.27)	(3.28)	(-0.70)	(-0.77)	(-1.21)	(3.12)	(-3.12)
N	5356	5356	5356	5356	5356	5356	5356	5356
R-squared	0.261	0.162	0.246	0.253	0.127	0.237	0.242	0.242

Panel D: Altman-Z score

	Salary	Bonus	Cash	Option	Stock	Equity	Short-term	Long-term
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cut * Constraint	-0.101***	0.0333	-0.0682**	0.0459	0.0246	0.0706**	-0.0571**	0.0571**
	(-4.10)	(1.62)	(-2.12)	(1.21)	(1.38)	(2.11)	(-2.25)	(2.25)
Increase * Constraint	0.0611	0.0107	0.0718	0.00491	-0.0498***	-0.0449	0.0735	-0.0735
	(1.33)	(0.39)	(1.53)	(0.12)	(-3.88)	(-1.06)	(1.57)	(-1.57)
N	5356	5356	5356	5356	5356	5356	5356	5356
R-squared	0.259	0.172	0.237	0.231	0.126	0.222	0.234	0.234

Table 23: **CEO Experience and Compensation**

This table presents the difference in difference estimates of CEO compensation following changes of import tariffs for firms that did not change their CEOs and whose CEOs have relevant skill sets. The dependent variables are total or components of CEO compensation. *Tariff Cut* (*Tariff Increase*) are the first three years after a tariff cut (increase) which is greater than 3 times the median tariff cut (increase). *Exp_cut* (*Exp_Increase*) is a dummy variable equal to 1 if the CEO has experience relevant to tariff cuts (increases) and 0 otherwise. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Panel A, C (Panel B, and D) show the estimates for tariff cuts (tariff increases). Panel C, and D show results for industry-ajusted variables (residuals of regressing variables on industry fixed effects). All variables are defined in the appendix. Standard errors are clustered by industry.

Panel A: The effect of CEOs' experience on their compensation: tariff cut

	Tariff Cut											
	Before Shock					Average Treatment Effects after shock						
Variable	No Experience	Exp_cut	Difference (p-value)	Exp_increase	Difference (p-value)	No Experience	Exp_cut	Difference	(p-value)	Exp_increase	Difference	(p-value)
Stock	0.820	1.016	0.544	3.461	0.000	0.647	2.276	1.630	0.005	-0.954	-1.600	0.141
Option	6.162	7.591	0.002	5.927	0.609	-0.202	1.096	1.299	0.023	0.645	0.847	0.079
Equity	6.251	7.685	0.002	6.369	0.795	0.117	1.281	1.163	0.020	0.915	0.797	0.057
Salary	6.514	6.590	0.408	6.480	0.713	-0.117	0.155	0.272	0.108	-0.294	-0.177	0.200
Cash	7.106	7.131	0.833	6.916	0.107	-0.179	0.124	0.303	0.207	-0.184	-0.005	0.972
Bonus	5.771	5.461	0.329	3.926	0.000	-0.641	-0.802	-0.161	0.815	1.427	2.069	0.000
Total Compensation	7.998	8.339	0.065	7.934	0.731	0.030	0.899	0.869	0.000	-0.104	-0.134	0.345
Delta	580.9	945.2	0.010	800.2	0.123	128.2	247.6	119.3	0.444	-588.8	-717.0	0.000
Vega	129.1	129.9	0.986	43.52	0.051	91.22	146.9	55.7	0.168	17.04	-74.19	0.058
Short_term	7.143	7.180	0.764	6.916	0.065	-0.133	0.098	0.231	0.309	-0.177	-0.044	0.743
Long_term	6.802	7.906	0.001	6.734	0.836	0.252	1.149	0.897	0.006	0.613	0.361	0.210
Equity/Total Compensation	0.423	0.534	0.011	0.558	0.002	0.058	0.239	0.181	0.026	0.046	-0.012	0.857

Panel B: The effect of CEOs' experience on their compensation: tariff Increase

	Tariff Increase											
	Before Shock					Average Treatment Effects after shock						
Variable	No Experience	Exp_cut	Difference (p-value)	Exp_increase	Difference (p-value)	No Experience	Exp_cut	Difference	(p-value)	Exp_increase	Difference	(p-value)
Stock	1.751	3.673	0.060	1.661	0.953	0.519	-0.580	-1.099	0.493	-0.487	-1.007	0.377
Option	7.477	7.623	0.777	7.230	0.707	-2.298	-1.229	1.069	0.124	-1.212	1.086	0.101
Equity	7.713	7.975	0.482	7.372	0.488	-1.820	-1.327	0.493	0.620	-1.267	0.553	0.264
Salary	5.718	6.547	0.024	6.311	0.084	0.084	-0.184	-0.269	0.161	-0.124	-0.208	0.138
Cash	6.603	7.058	0.259	6.756	0.643	-0.117	-0.117	0.000	1.000	-0.158	-0.040	0.875
Bonus	5.063	4.612	0.523	4.533	0.376	0.112	0.364	0.252	0.697	-0.020	-0.132	0.922
Total Compensation	8.764	8.422	0.290	8.048	0.004	-0.980	-0.178	0.802	0.152	-0.425	0.555	0.045
Delta	893.1	870.7	0.976	782.0	0.644	23.98	59.22	35.25	0.957	-593.7	-617.7	0.126
Vega	526.3	584.2	0.904	173.7	0.000	-195.4	-438.0	-242.6	0.582	-63.75	131.6	0.022
Short_term	6.643	7.082	0.280	6.758	0.731	-0.127	-0.086	0.041	0.916	-0.149	-0.023	0.935
Long_term	8.241	8.044	0.535	7.491	0.068	-1.610	-1.047	0.563	0.640	-1.143	0.467	0.283
Equity/Total Compensation	0.607	0.660	0.458	0.571	0.759	-0.202	-0.160	0.041	0.462	-0.037	0.164	0.158

Panel C: The effect of CEOs' experience on compensation: tariff cut and industry adjusted

	Tariff Cut											
	Before Shock					Average Treatment Effects after shock						
Variable	No Experience	Exp_cut	Difference (p-value)	Exp_increase	Difference (p-value)	No Experience	Exp_cut	Difference	(p-value)	Exp_increase	Difference	(p-value)
Stock	-0.886	-0.031	0.010	2.414	0.000	0.777	2.049	1.272	0.003	-1.357	-2.134	0.003
Option	0.584	1.137	0.142	-0.527	0.003	-0.054	1.211	1.265	0.025	1.088	1.142	0.000
Equity	0.225	1.132	0.010	-0.184	0.247	0.331	1.287	0.956	0.049	1.150	0.819	0.031
Salary	0.133	0.257	0.197	0.148	0.879	-0.120	0.136	0.257	0.176	-0.349	-0.229	0.196
Cash	0.178	0.326	0.211	0.111	0.569	-0.168	0.093	0.261	0.361	-0.268	-0.099	0.640
Bonus	0.393	0.516	0.522	-1.020	0.000	-0.434	-0.914	-0.481	0.588	1.170	1.604	0.000
Total Compensation	0.161	0.369	0.220	-0.035	0.247	0.066	0.914	0.848	0.000	-0.041	-0.107	0.289
Delta	-841.6	142.2	0.237	-2.774	0.313	461.3	308.7	-152.6	0.554	-423.7	-885.0	0.002
Vega	-22.46	-60.92	0.282	-147.3	0.000	95.57	157.9	62.31	0.065	36.34	-59.23	0.288
Short_term	0.185	0.337	0.229	0.073	0.380	-0.126	0.068	0.194	0.470	-0.261	-0.135	0.487
Long_term	0.028	0.853	0.004	-0.320	0.230	0.389	1.167	0.778	0.012	0.756	0.367	0.072
Equity/Total Compensation	-0.010	-0.006	0.952	0.017	0.622	0.073	0.255	0.183	0.040	0.108	0.036	0.549

Panel D: The effect of CEOs' experience on compensation: tariff increase and industry adjusted

	Tariff Increase											
	Before Shock					Average Treatment Effects after shock						
Variable	No Experience	Exp_cut	Difference (p-value)	Exp_increase	Difference (p-value)	No Experience	Exp_cut	Difference	(p-value)	Exp_increase	Difference	(p-value)
Stock	0.206	2.609	0.022	0.578	0.813	0.389	-0.494	-0.883	0.568	-0.321	-0.710	0.495
Option	1.837	1.790	0.910	1.392	0.416	-2.363	-1.444	0.919	0.253	-1.496	0.867	0.109
Equity	1.799	2.079	0.381	1.492	0.349	-1.999	-1.556	0.443	0.674	-1.562	0.437	0.277
Salary	-0.304	0.476	0.003	0.229	0.028	0.137	-0.074	-0.211	0.218	0.016	-0.121	0.381
Cash	0.007	0.465	0.048	0.139	0.382	-0.040	-0.014	0.026	0.942	-0.004	0.036	0.865
Bonus	0.241	0.042	0.743	-0.110	0.422	0.254	0.623	0.368	0.454	0.371	0.117	0.922
Total Compensation	0.972	0.709	0.460	0.307	0.001	-0.988	-0.267	0.720	0.230	-0.501	0.487	0.064
Delta	-240.3	-517.2	0.753	-601.4	0.025	-63.8	-474.9	-411.1	0.652	-1233.9	-1170.1	0.000
Vega	323.3	411.5	0.859	-11.48	0.000	-192.8	-473.2	-280.4	0.535	-95.38	97.40	0.057
Short_term	0.026	0.455	0.062	0.115	0.549	-0.061	0.014	0.075	0.830	-0.002	0.059	0.799
Long_term	1.507	1.475	0.932	0.858	0.025	-1.693	-1.217	0.476	0.706	-1.280	0.413	0.261
Equity/Total Compensation	0.145	0.202	0.140	0.105	0.655	-0.212	-0.206	0.007	0.920	-0.090	0.123	0.163

Table 24: **CEO Experience and Compensation: multivariate analyses**

This table presents the difference in difference and triple difference estimates of CEO compensation following changes of import tariffs for firms that did not change their CEOs and whose CEOs have skill sets relevant to high and low competition environments. The dependent variables are total or components of CEO compensation. *Tariff Cut* (*Tariff Increase*) are the first three years after a tariff cut (increase) which is greater than 3 times the median tariff cut (increase). *Exp_cut* (*Exp_Increase*) is a dummy variable equal to 1 if the CEO has experience relevant to tariff cuts (increases) and 0 otherwise. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Panel A (Panel B) shows the estimates adding firm fixed effects (industry fixed effects). All variables are defined in the appendix and lagged one year. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: The effect of CEOs' experience on their compensation: firm fixed effects

	Total	Salary	Bonus	Cash	Option	Stock	Equity	Delta	Vega	Short-term	Long-term
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Cut	0.124	-0.0686	0.0354	-0.0593	0.227	0.543	0.500	-26.80	44.24	-0.00977	0.387
	(1.00)	(-1.15)	(0.12)	(-0.70)	(0.40)	(1.29)	(1.16)	(-0.17)	(0.86)	(-0.17)	(1.26)
Increase	-0.644*	-0.0781	0.191	-0.292	-1.383***	0.313	-0.760**	183.5	-71.65	-0.332	-0.931**
	(-1.78)	(-1.38)	(0.58)	(-1.17)	(-3.71)	(0.53)	(-2.27)	(1.62)	(-1.15)	(-1.25)	(-2.16)
Exp_cut	-0.0856	0.00920	-0.394	-0.0577*	0.122	-0.489	-0.327	-329.4	7.046	-0.0697**	-0.0674
	(-0.67)	(0.43)	(-1.46)	(-1.93)	(0.32)	(-1.13)	(-0.95)	(-1.19)	(0.21)	(-2.02)	(-0.29)
Exp_increase	-0.0993	-0.0678***	0.408	0.0299	-0.365	0.383	-0.284	-310.0	-16.12	0.0425	-0.251*
	(-1.05)	(-3.13)	(1.11)	(0.56)	(-1.49)	(0.96)	(-1.13)	(-1.62)	(-0.80)	(0.56)	(-1.82)
Cut * Exp_cut	-0.00468	0.132*	-1.000**	-0.114	-0.0664	0.116	-0.199	-180.3	18.92	-0.157**	-0.271
	(-0.03)	(1.79)	(-2.46)	(-1.17)	(-0.09)	(0.20)	(-0.34)	(-1.07)	(0.22)	(-2.29)	(-0.62)
Cut * Exp_increase	0.0613	0.0857	-0.680	0.0860	0.463	-0.982**	0.292	176.3	-6.706	-0.0107	0.413
	(0.55)	(0.75)	(-1.09)	(1.02)	(1.03)	(-2.38)	(0.73)	(1.08)	(-0.18)	(-0.13)	(1.48)
Increase * Exp_cut	0.722	0.198***	1.688***	0.715***	1.068**	0.677	0.857*	453.7***	124.6**	0.735***	0.769
	(1.67)	(4.89)	(2.88)	(4.74)	(2.42)	(1.22)	(1.76)	(3.47)	(2.10)	(4.54)	(1.42)
Increase * Exp_increase	-0.662**	-0.0527	-1.836	-0.134	0.270	-1.462***	-0.506	-754.5***	-142.9**	-0.0998	-0.373
	(-2.07)	(-1.32)	(-1.32)	(-0.68)	(0.44)	(-4.16)	(-1.02)	(-4.15)	(-2.18)	(-0.49)	(-0.85)
Control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	1314	1320	1320	1320	1314	1320	1320	1312	1317	1320	1314
R-squared	0.653	0.795	0.535	0.704	0.513	0.590	0.471	0.650	0.664	0.740	0.542

Panel B: The effect of CEOs' experience on their compensation: industry fixed effects

Variable	Total (1)	Salary (2)	Bonus (3)	Cash (4)	Option (5)	Stock (6)	Equity (7)	Delta (8)	Vega (9)	Short-term (10)	Long-term (11)
Cut	0.113	-0.104*	-0.351	-0.166**	0.509	0.232	0.461	-162.0	23.68	-0.102*	0.287
	(1.02)	(-1.73)	(-1.27)	(-2.12)	(1.24)	(0.77)	(1.20)	(-0.89)	(0.60)	(-1.72)	(1.11)
Increase	-0.573**	-0.107	0.0721	-0.256	-1.148***	0.00454	-0.888**	202.0***	-27.06	-0.292	-0.958***
	(-2.42)	(-1.02)	(0.27)	(-1.19)	(-3.13)	(0.01)	(-2.50)	(3.13)	(-0.67)	(-1.30)	(-2.80)
Exp_cut	0.117*	0.120	0.362	0.125	0.369	-0.211	0.326	-450.8***	-47.82	0.104	0.293*
	(1.89)	(1.39)	(0.98)	(1.12)	(1.07)	(-0.76)	(1.38)	(-3.12)	(-1.19)	(0.86)	(1.96)
Exp_increase	0.0864	-0.00406	0.213	-0.000117	0.408*	0.146	0.365*	-296.2**	-28.84	0.00970	0.116
	(1.53)	(-0.05)	(1.14)	(-0.00)	(1.78)	(0.51)	(1.79)	(-2.26)	(-1.12)	(0.23)	(0.74)
Cut * Exp_cut	0.114	0.0725	-1.594***	-0.164	-0.0458	1.976***	0.152	270.8**	-166.7***	-0.272**	0.132
	(1.29)	(1.06)	(-4.36)	(-1.44)	(-0.09)	(4.99)	(0.44)	(2.39)	(-2.99)	(-2.45)	(0.57)
Cut * Exp_increase	-0.0152	-0.0425	0.0226	0.0582	-0.0584	1.368	0.662	60.47	-17.71	-0.0304	0.444*
	(-0.12)	(-0.25)	(0.05)	(0.39)	(-0.11)	(1.43)	(1.46)	(0.31)	(-0.28)	(-0.23)	(1.70)
Increase * Exp_cut	0.569***	0.621***	0.660	0.541***	1.481***	1.405***	1.265***	326.2**	-151.4***	0.575***	1.122***
	(4.94)	(7.41)	(1.65)	(4.57)	(4.48)	(4.41)	(5.10)	(2.08)	(-2.69)	(4.34)	(5.60)
Increase * Exp_increase	-0.0184	0.548***	0.209	0.353***	0.665**	-1.584***	0.181	-415.1**	-85.00	0.346***	0.173
	(-0.15)	(7.20)	(0.31)	(3.03)	(2.56)	(-3.39)	(0.73)	(-2.42)	(-1.52)	(3.13)	(0.81)
Control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	1373	1379	1379	1379	1373	1379	1379	1373	1377	1379	1373
R-squared	0.415	0.278	0.290	0.400	0.190	0.268	0.201	0.225	0.258	0.419	0.275

Appendix

Variable definitions

Variable	Description
Panel A: CEO Pay	
Total Comp	Total CEO pay [EXECUCOMP log(1+(TDC1))]
Short-term Comp	Short-term pay consists of salary, bonus, non-equity incentive plan and other annaul [EXECOCUMP log(1+(SALARY + BONUS + NONEQ_INCENT + OTHANN))]
Long-term Comp	The difference between Total compenstation - Short-term compensation [EXECUCOMP log(1+(TDC1- (SALARY + BONUS + NONEQ_INCENT + OTHANN)))]
Delta	Pay-performance sensitivity (Coles et al., 2006))
Vega	Risk-taking incentive (Coles et al., 2006)
Panel B: Firm Characteristics	
Assets	Logarithm of total assets [COMPUSTAT log(AT)]
Buy&Hold	Annual stock return
ROA	Income before extraordinary items divided by lagged total assets (COMPUSTAT IB/lag(AT))
ROE	Net income divided by lagged total stockholders' equity [COMPUSTAT NI/lag(SEQ)]
Volatility	Annualized standard deviation of monthly stock returns (CRSP)
Turnover	A dummy variable that equals to 1 if the name of the CEO in year t is different from the name of the CEO in year t+1 and zero otherwise (EXECUCOMP)
G-index	Governance index (Gompers et al., 2003)
Board size	The number of directors [IRRC]
Board Independence	The number of independent directors [IRRC]
Institutional Ownership	Total number of shares held by institutional investors divided by the number of shares outstanding [THOMSON]
Increase	A dummy variable that equals to 1 for the 3 years following a major tariff increase
Cut	A dummy variable that equals to 1 for the 3 years following a major tariff cut
Age	Age of CEO in years (EXECUCOMP)
Panel C: Proxies for low-competition Skills	
R&D	Research and development expenses divided by lagged total assets [COMPUSTAT XRD/lag(AT)]
Tobin's Q	Total assets plus market value of equity minus book value of equity divided by total assets [Compustat (AT -CSHO*PRCC_F - CEQ)/AT)]
Panel D: Proxies for high-competition Skills	
COGS	Cost of goods sold divided by lagged total property, plant, and equipment [COMPUSTAT COGS / lag(PPENT)]
SPPE	Sale of property by lagged total property, plant, and equipment [COMPUSTAT SPPE / lag(PPENT)]
SG&A	Selling, general and administrative expense divided by lagged total property, plant, and equipment [COMPUSTAT XSGA / lag(PPENT)]
PPENT	Total property, plant, and equipment divided by lagged total assets [COMPUSTAT PPENT / lag(AT)]
Sale_change	Change of firm sales
Competition	Herfindahl-Hirschman concetration index of sales (3-digit SIC codes)

Table A1: **Tariff Shocks and CEO Turnover: corporate governance**

This table presents the estimates for the changes in CEO turnover following changes of import tariffs. The dependent variable equals 1 if the CEO either is forced out or leaves the firm for unspecified reasons and is younger than 65 years, and 0 otherwise. *Cut* (*Increase*) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. *Institutional Holdings* is the portion of a firm's shares outstanding that is held by institutional investors. *Board Independence* measures the portion of independent directors on the board. *G-Index* is the governance index by Gompers et al. (2003). *E-Index* is the entrenchment index by Bebchuk et al. (2009). the Panel A shows the results for firms with strong and weak governance separately. Panel B shows the results for the interaction of weak governance dummy, and *Cut* and *Increase*. Control variables are lagged and include industry-adjusted return on assets, industry-adjusted buy and hold returns, changes in sales, Tobin's Q, volatility, competition, age dummy, and CEO tenure. All variables are defined in the appendix. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: Turnover and corporate governance

	Institutional Holdings		Board Independence		G-Index		E-Index	
	Strong	Weak	Strong	Weak	Strong	Weak	Strong	Weak
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cut	0.0656***	0.0466***	0.0695***	0.0417*	0.0288	0.0786***	0.0206*	0.0729***
	(3.01)	(3.73)	(2.75)	(1.82)	(1.58)	(3.36)	(1.80)	(3.31)
Increase	0.0541*	0.0433	0.0684***	0.0264	0.0439*	0.0544*	0.0383	0.0394*
	(1.86)	(1.45)	(2.64)	(1.21)	(1.72)	(1.96)	(1.62)	(1.87)
Control	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
N	2880	2493	1790	1608	2721	1699	2029	2383
R-squared	0.253	0.254	0.227	0.273	0.246	0.235	0.244	0.245

Panel B: Interaction of governance and tariff changes

	Institutional Holdings		Board Independence		G-Index		E-Index	
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cut	0.0594**	0.0351***	0.0586***	0.0334**	0.0379	0.0308**	0.0276*	0.0306***
	(2.58)	(3.85)	(3.33)	(2.34)	(1.58)	(2.40)	(1.90)	(3.09)
Increase	0.0651**	0.0240	0.0548***	0.0543***	0.0299	0.0270*	0.0426*	0.0323*
	(2.14)	(0.86)	(2.65)	(2.63)	(1.26)	(1.69)	(1.93)	(1.71)
Governance	0.0102*	-0.00584*	0.000612	-0.00131	-0.0526*	-0.00319	-0.0247**	-0.00576
	(1.74)	(-1.89)	(0.08)	(-0.32)	(-1.72)	(-0.82)	(-2.10)	(-1.25)
Cut * Governance	-0.0222	0.0229	-0.0199	0.0327*	0.0602*	0.0295*	0.0328*	0.0279**
	(-0.74)	(1.45)	(-0.81)	(1.73)	(1.71)	(1.73)	(1.81)	(2.00)
Increase * Governance	-0.0442*	0.0292	-0.0169	0.0135	0.00509	0.0193	-0.00534	0.0155
	(-1.91)	(1.19)	(-0.68)	(0.62)	(0.14)	(1.11)	(-0.22)	(0.95)
Control	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effects	Y	N	Y	N	Y	N	Y	N
Industry Fixed Effects	N	Y	N	Y	N	Y	N	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
N	5595	5689	3564	3679	4491	4598	4491	4598
R-squared	0.180	0.039	0.204	0.048	0.187	0.040	0.188	0.040

Table A2: **CEO Replacement: summary statistics and multinomial logit model**

This table presents statistics summary for types of CEO replacement. For firms that have turnover and hire a replacement, the replacement is categorized into three groups: firm insider, industry insider (outside the firm but inside the industry), and industry outsider. The sample comprises all the turnovers for publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Panel A presents summary statistics for CEO replacement. The percentage of total turnover and the percentage of each category are shown in parenthesis in front of and below the numbers. Panel B shows estimations of multinomial logit models. The reference category is firm insider. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase) which is greater than 3 times in Columns 1-2 the median tariff cut(increase), small and large tariff changes are changes in import tariff that are 2 times (columns 3-4) and 4 times (columns 5-6) the median tariff change. Control variables are lagged and include industry-adjusted return on assets, industry-adjusted buy and hold returns, age dummy, CEO tenure, and firm size. All variables are defined in the appendix. Marginal effects of independent variables on the probabilities of every outcome type happening, relative to the reference category (firm insider), are listed in square brackets.Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: Summary Statistics for CEO replacement

	Turnover		
	Unforced	Forced	Total
Industry Outsider	122 (79%)	33 (21%)	155 (100%)
	(21%)	(24%)	(22%)
Industry Insider	44 (73%)	16 (27%)	60 (100%)
	(7%)	(11%)	(8%)
Firm insider	418 (83%)	87 (17%)	505 (100%)
	(72%)	(64%)	(70%)
Total	584 (81%)	136 (19%)	720 (100%)
	(100%)	(100%)	(100%)

Panel B:Multinomial logit models for CEO replacement

	$3 \times Median$		$2 \times Median$		$4 \times Median$	
	Industry Insider	Industry Outsider	Industry Insider	Industry Outsider	Industry Insider	Industry Outsider
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Cut	0.280	0.153	0.0887	0.690*	0.387	0.235***
	(0.31)	(0.48)	(0.12)	(1.93)	(0.45)	(5.86)
	[2.27%]	[3.13%]	[0.93%]	[10.3%]	[2.26%]	[2.89%]
Increase	0.841	0.522*	-2.329***	0.345	-3.325***	1.269*
	(1.29)	(1.70)	(-3.93)	(0.49)	(-4.27)	(1.67)
	[5.08%]	[6.54%]	[-92.4%]	[30.2%]	[-80.6%]	[43.4%]
Assets	-0.0230	-0.257***	0.0295	-0.256***	0.0151	-0.254***
	(-0.20)	(-4.15)	(0.32)	(-3.17)	(0.15)	(-3.35)
	[0.26%]	[-3.82%]	[0.37%]	[-4.01%]	[0.37%]	[-3.85%]
Controls	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observation	622		470		592	

Table A3: **CEO replacement and CEO experience**

This table presents statistics summary and linear probability models for skill choices of CEO replacement. For firms that have turnover and hire a replacement, the replacement is categorized in two group: CEOs with relevant experiences (CEOs' whose skill index is on the top quartile) and CEO without relevant skills (CEOs' whose skill index is on the bottom quartile). The sample comprises all the turnovers for publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Panel A presents summary statistics for CEO replacement. The percentage of total turnover and the percentage of each category are shown in parenthesis in front of and below the numbers. Panel B and C show estimations of linear probability models. The dependent variable is equal to 1 if a firm hires a CEO with a relevant skill set and 0 otherwise. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase) which is greater than 3 times the median tariff cut(increase), Panel B (C) shows the results for hiring a CEO with skills suitable for high competition (low competition). Control variables are lagged and include volatility, and firm size. All variables are defined in the appendix. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: Summary Statistics for CEO replacement

	No Experience	Experience			
		Increase	Cut	Both	Total
Industry Outsider	23 (68%)	6 (17%)	5 (15%)	0	34
	(16%)	(19%)	(28%)	(0%)	
Industry Insider	11 (46%)	7 (29%)	5 (21%)	1 (4%)	24
	(8%)	(23%)	(28%)	(50%)	
Firm insider	110 (80%)	18 (13%)	8 (6%)	1 (1%)	137
	(76%)	(58%)	(44%)	(50%)	
Total	144	31	18	2	195

Panel B:Hiring a CEO with skills relevant to high competition

	Institutional Holdings		Board Independence		G Index		E Index	
	Strong	Weak	Strong	Weak	Strong	Weak	Strong	Weak
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cut	-0.0759**	-0.0268	-0.0274	0.00823**	-0.0455**	0.0182*	-0.0552**	0.0192*
	(-2.30)	(-1.32)	(-1.05)	(2.34)	(-2.18)	(1.74)	(-2.00)	(1.77)
Increase	-0.0394**	-0.0362*	-0.0501**	-0.0203	-0.0151*	-0.0483**	-0.0321***	-0.0396
	(-2.43)	(-1.80)	(-2.12)	(-1.01)	(-1.78)	(-2.13)	(-2.69)	(-1.54)
Control	Y	Y	Y	Y	Y	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
N	332	288	242	168	316	208	341	183
R-squared	0.067	0.089	0.059	0.048	0.041	0.088	0.040	0.088

Panel C:Hiring a CEO with skills relevant to low competition

	Institutional Holdings		Board Independence		G Index		E Index	
	Strong	Weak	Strong	Weak	Strong	Weak	Strong	Weak
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cut	-0.0438**	0.0393	-0.0214	-0.0146	-0.0165	0.0701	-0.0362*	0.000182
	(-2.21)	(1.35)	(-1.06)	(-0.47)	(-1.37)	(1.22)	(-1.87)	(0.01)
Increase	0.0385**	-0.0340*	0.0455*	-0.0500*	0.0216*	-0.0547*	0.00431	-0.0554**
	(2.49)	(-1.77)	(1.97)	(-1.67)	(1.67)	(-1.93)	(0.16)	(-2.04)
Control	Y	Y	Y	Y	Y	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
N	332	288	242	168	316	208	341	183
R-squared	0.047	0.073	0.047	0.075	0.054	0.102	0.072	0.094

Table A4: **CEO Turnover Before Tariff Shocks**

This table presents the estimates for the changes in CEO turnover before changes of import tariffs. The dependent variable equals 1 if the CEO either is forced out or leaves the firm for unspecified reasons and is younger than 65 years, and 0 otherwise. *Cut* (*Increase*) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). *Will_Cut* (*Will_Increase*) is a dummy variable equal to 1 for the last three years before a tariff cut (increase). The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables are lagged and include firm size, industry-adjusted return on assets, changes in sales, Tobin's Q, volatility, and competition. All variables are defined in the appendix. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

	One Year Before		Two Year Before		Three Year Before	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Cut	0.0459***	0.0477***	0.0457***	0.0459***	0.0463***	0.0453***
	(4.71)	(3.63)	(5.15)	(3.79)	(4.69)	(3.80)
Increase	0.0446**	0.0424	0.0458**	0.0448*	0.0453**	0.0436
	(2.14)	(1.66)	(2.17)	(1.68)	(2.10)	(1.64)
Will_Cut	-0.00770	-0.00828	-0.00527	-0.0132	-0.00179	-0.0152
	(-0.74)	(-0.48)	(-0.39)	(-1.10)	(-0.17)	(-1.25)
Will_Increase	-0.0164	-0.0133	0.00639	0.0161	-0.000332	0.00542
	(-1.61)	(-0.80)	(0.33)	(0.61)	(-0.02)	(0.24)
Control		Y		Y		Y
Firm Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y
N	6915	5595	6915	5595	6915	5595
R-squared	0.178	0.179	0.178	0.179	0.178	0.179

Table A5: **Alternative Definition for CEO Skills: capital spending**

This table presents the replication of main results using an alternative definition of CEO skills. In addition to main variables (changes in sales, asset sales, costs of goods sold, competition, and SG&A for high-competition skills and Tobin's Q and R&D for low-competition skills), capital spending is also used to measure CEO skills. The dependent variable equals 1 if the CEO either is forced out or leaves the firm for unspecified reasons and is younger than 65 years, and 0 otherwise. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). Exp_cut (Exp_Increase) is a dummy variable equal to 1 if the CEO has experience relevant to tariff cuts (increases) and 0 otherwise. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables are lagged and include industry-adjusted return on assets, industry-adjusted buy and hold returns, changes in sales, Tobin's Q, volatility, competition, age dummy, CEO tenure and Institutional Ownership. Governance control variables include G-index, Board Size, and Board Independence. All variables are defined in the appendix. In Columns 1-3, the new skill variable is used. In Column 4, the main results (Table 7) are shown for comparison. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

	Turnover	Turnover	Turnover	Turnover
Variable	(1)	(2)	(3)	(4)
Cut	0.0282**	0.0267*	0.0290**	0.197***
	(2.08)	(1.82)	(2.09)	(2.78)
Cut * Exp_Cut	-0.0226*	-0.0278*	-0.0218*	-0.151***
	(-1.76)	(-1.84)	(-1.98)	(-4.63)
Cut * Exp_Increase	0.0247	0.0235	0.0385	-0.0205
	(0.78)	(0.57)	(0.65)	(-0.42)
Increase	0.145**	0.172**	0.195***	0.157**
	(2.40)	(2.48)	(2.80)	(2.36)
Increase * Exp_Increase	-0.167***	-0.176**	-0.111**	-0.212***
	(-2.68)	(-2.07)	(-2.56)	(-3.09)
Increase * Exp_Cut	-0.395***	0.0651	0.0956	0.124***
	(-7.28)	(1.60)	(1.42)	(3.07)
Exp_Cut	-0.00105	0.000436	-0.00479	-0.0273
	(-0.29)	(0.07)	(-0.44)	(-0.84)
Exp_Increase	-0.0494	-0.0564	-0.0807	0.0115
	(-1.37)	(-1.12)	(-1.09)	(0.22)
Controls		Y	Y	Y
Goveranance Controls			Y	Y
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
R-squared	1196	1011	716	0.312
Observation	0.325	0.363	0.428	923

Table A6: **Alternative Definition for CEO Experience: 5 and 15 years**

This table presents the triple difference estimates for the changes in CEO turnover following changes of import tariffs. The dependent variable equals 1 if the CEO either is forced out or leaves the firm for unspecified reasons and is younger than 65 years, and 0 otherwise. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). Exp_cut (Exp_Increase) is a dummy variable equal to 1 if the CEO has experience relevant to tariff cuts (increases) and 0 otherwise. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables are lagged and include industry-adjusted return on assets, industry-adjusted buy and hold returns, changes in sales, Tobin's Q, volatility, competition, age dummy, CEO tenure and Institutional Ownership. Governance control variables include G-index, Board Size, and Board Independence. All variables are defined in the appendix. In Columns 4-6, the event year observations are excluded. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: 15 Years

Variable	Turnover (1)	Turnover (2)	Turnover (3)	Turnover (4)	Turnover (5)	Turnover (6)	Turnover (7)	Turnover (8)	Turnover (9)
Cut * Exp_Cut	-0.0639**	-0.0817***	-0.127***	-0.0703**	-0.0883***	-0.144***	-0.0629***	-0.0769***	-0.117***
	(-2.47)	(-4.31)	(-6.92)	(-2.08)	(-3.85)	(-8.28)	(-2.73)	(-5.63)	(-7.77)
Increase * Exp_Increase	-0.0658*	-0.0775**	-0.111***	-0.0845*	-0.104**	-0.145***	-0.0635**	-0.0755**	-0.102***
	(-1.92)	(-2.43)	(-3.11)	(-1.91)	(-2.34)	(-3.41)	(-2.00)	(-2.26)	(-2.78)
Cut	0.154***	0.184***	0.261***	0.188***	0.223***	0.314***	0.148***	0.170***	0.225***
	(3.01)	(4.41)	(6.23)	(2.81)	(3.99)	(6.70)	(3.15)	(3.92)	(5.35)
Cut * Exp_Increase	-0.0658*	-0.0775**	-0.111***	-0.0845*	-0.104**	-0.145***	-0.0635**	-0.0755**	-0.102***
	(-1.92)	(-2.43)	(-3.11)	(-1.91)	(-2.34)	(-3.41)	(-2.00)	(-2.26)	(-2.78)
Increase	0.153***	0.205***	0.409***	0.0821***	0.0699***	0.0527*	0.192***	0.220***	0.441***
	(3.88)	(5.40)	(3.10)	(3.59)	(3.16)	(1.83)	(5.05)	(5.93)	(3.77)
Increase * Exp_Cut	-0.0612	-0.0914	-0.169*	0.0516**	0.112***	0.141*	-0.0569	-0.0870	-0.178
	(-1.37)	(-1.40)	(-1.68)	(2.54)	(2.99)	(1.99)	(-1.02)	(-1.31)	(-1.61)
Exp_Cut	-0.0105	-0.00951	-0.0127	-0.0110	-0.0127	-0.0124	-0.0102	-0.0110	-0.00858
	(-0.95)	(-0.65)	(-0.61)	(-0.94)	(-0.91)	(-0.61)	(-0.82)	(-0.66)	(-0.34)
Exp_Increase	-0.00710	-0.00982	-0.00566	-0.00430	-0.00766	-0.0108	-0.0109	-0.0128	-0.00647
	(-0.32)	(-0.34)	(-0.14)	(-0.18)	(-0.25)	(-0.26)	(-0.44)	(-0.39)	(-0.14)
Controls		Y	Y		Y	Y		Y	Y
Goveranance Controls			Y			Y			Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y			
Industry#Year FE							Y	Y	Y
R-squared	0.307	0.289	0.342	0.320	0.310	0.361	0.374	0.372	0.433
Observation	1733	1468	1060	1656	1398	1006	1674	1417	1027

Panel B: Five years

Variable	Turnover (1)	Turnover (2)	Turnover (3)	Turnover (4)	Turnover (5)	Turnover (6)	Turnover (7)	Turnover (8)	Turnover (9)
Cut	0.110**	0.109**	0.158**	0.137***	0.142***	0.186***	0.0999**	0.0823	0.131*
	(2.48)	(2.52)	(2.30)	(2.72)	(3.20)	(2.81)	(2.26)	(1.63)	(1.78)
Cut * Exp_Cut	-0.0824***	-0.0890***	-0.114***	-0.117***	-0.131***	-0.153***	-0.0763***	-0.0784***	-0.106**
	(-3.26)	(-4.41)	(-3.42)	(-3.39)	(-5.86)	(-4.19)	(-3.50)	(-3.26)	(-2.34)
Cut * Exp_Increase	-0.00570	0.00595	-0.0114	0.00495	0.0155	-0.00171	-0.00510	0.0130	-0.0116
	(-0.18)	(0.19)	(-0.24)	(0.16)	(0.49)	(-0.04)	(-0.14)	(0.34)	(-0.22)
Increase	0.111***	0.128***	0.216***	0.101***	0.127***	0.122*	0.120***	0.143***	0.214***
	(3.59)	(3.88)	(4.49)	(3.22)	(3.49)	(1.87)	(4.19)	(5.11)	(6.15)
Increase * Exp_Increase	-0.267***	-0.325**	-0.525***	-0.0244	-0.126	-0.227*	-0.0372	-0.147	-0.262**
	(-6.07)	(-2.48)	(-9.36)	(-0.61)	(-0.99)	(-1.89)	(-1.01)	(-0.97)	(-2.16)
Increase * Exp_Cut	-0.0310	0.0523	0.0565	0.217***	0.284**	0.471***	0.0216	0.107	0.160
	(-0.74)	(0.45)	(0.53)	(4.89)	(2.22)	(7.28)	(0.47)	(0.74)	(1.28)
Exp_Cut	-0.0180	-0.0117	-0.0118	-0.0179	-0.0127	-0.0162	-0.00767	-0.00293	-0.00410
	(-0.87)	(-0.54)	(-0.38)	(-0.85)	(-0.58)	(-0.50)	(-0.31)	(-0.10)	(-0.11)
Exp_Increase	0.0171	0.0113	0.0290	0.00684	-0.000177	0.0122	0.0153	0.0102	0.0247
	(0.42)	(0.28)	(0.45)	(0.18)	(-0.00)	(0.19)	(0.39)	(0.25)	(0.41)
Controls		Y	Y		Y	Y		Y	Y
Goveranance Controls			Y			Y			Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y			
Industry#Year FE							Y	Y	Y
R-squared	0.317	0.305	0.340	0.352	0.340	0.391	0.400	0.409	0.454
Observation	1298	1102	805	1239	1049	763	1249	1056	769

Table A7: **CEO Experience and CEO Turnover: executive experience**

This table presents the triple difference estimates for the changes in CEO turnover following changes of import tariffs. The dependent variable equals 1 if the CEO either is forced out or leaves the firm for unspecified reasons and is younger than 65 years, and 0 otherwise. *Cut* (*Increase*) is a dummy variable equal to 1 for the first three years after a tariff cut (increase). *Exp_cut* (*Exp_Increase*) is a dummy variable equal to 1 if the CEO has gained skills relevant to tariff cuts (increases) while served as an executive (CEO, CFO, COO, president) and 0 otherwise. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables are lagged and include industry-adjusted return on assets, industry-adjusted buy and hold returns, changes in sales, Tobin's Q, volatility, competition, age dummy, CEO tenure and Institutional Ownership. Governance control variables include G-index, Board Size, and Board Independence. All variables are defined in the appendix. In Columns 4-6, the event year observations are excluded. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover	Turnover
variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cut * Exp_Cut	-0.024***	-0.038***	-0.0664**	-0.039***	-0.042***	-0.0833*	-0.022***	-0.035***	-0.0982**
	(-8.10)	(-17.13)	(-2.22)	(-12.57)	(-15.90)	(-1.87)	(-5.83)	(-8.74)	(-2.28)
Increase * Exp_Increase	-0.0765**	-0.0730**	-0.0602**	-0.112***	-0.124***	-0.0974**	-0.0804***	-0.0756***	-0.0680***
	(-2.27)	(-2.61)	(-2.05)	(-3.03)	(-3.16)	(-2.37)	(-2.73)	(-3.92)	(-2.97)
Cut	0.0184**	0.0159	0.0344*	0.0216**	0.0200*	0.0404*	0.0160***	0.00919**	0.0268*
	(2.00)	(1.65)	(1.76)	(2.20)	(1.96)	(1.78)	(3.39)	(2.06)	(1.73)
Cut * Exp_Increase	0.087***	0.086***	0.104***	0.075***	0.080***	0.104***	0.085***	0.084***	0.100***
	(21.22)	(24.27)	(34.66)	(15.16)	(17.19)	(26.61)	(19.11)	(26.38)	(34.10)
Increase	0.0583***	0.0548**	0.0548	0.0717**	0.0949**	0.0971*	0.0965***	0.0929***	0.111***
	(2.75)	(2.01)	(1.66)	(2.09)	(2.28)	(1.97)	(3.89)	(3.16)	(3.43)
Increase * Exp_Cut	0.0186	0.112***	0.185***	0.194***	0.213***	0.324***	0.0118	0.0941	0.181***
	(0.54)	(2.68)	(5.82)	(3.41)	(3.35)	(5.68)	(0.27)	(1.50)	(4.31)
Exp_Cut	0.00534	-0.0192	-0.00633	0.00915	-0.0170	-0.00212	0.0262	0.0124	0.0215
	(0.14)	(-0.60)	(-0.26)	(0.20)	(-0.45)	(-0.06)	(0.73)	(0.50)	(0.69)
Exp_Increase	-0.0276	0.00390	-0.0327	-0.0283	-0.00848	-0.0477	-0.0163	0.0272	-0.0220
	(-0.60)	(0.11)	(-1.32)	(-0.57)	(-0.21)	(-1.26)	(-0.29)	(0.58)	(-0.62)
Control		Y	Y		Y	Y		Y	Y
Governance			Y			Y			Y
Firm Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y			
Industry#Year Fixed Effects							Y	Y	Y
N	1352	1132	785	1293	1080	746	1298	1083	749
R-squared	0.333	0.324	0.354	0.366	0.358	0.400	0.402	0.410	0.455

Table A8: **Tariff Shocks and CEO Turnover: probit model**

This table presents the triple difference estimates for the changes in CEO turnover following changes of import tariffs. The dependent variable equals 1 if the CEO either is forced out or leaves the firm for unspecified reasons and is younger than 65 years, and 0 otherwise. Cut (Increase) is a dummy variable equal to 1 for the first three years after a tariff cut (increase) which is greater than 3 times in Columns 1-3 the median tariff cut(increase), Exp_cut (Exp_Increase) is a dummy variable equal to 1 if the CEO has experience relevant to tariff cuts (increases) and 0 otherwise. The sample comprises publicly traded, manufacturing firms (SIC codes 2000-3999). The sample period is between 1992 and 2005. Control variables are lagged and include industry-adjusted return on assets, industry-adjusted buy and hold returns, changes in sales, Tobin's Q, volatility, competition, age dummy, CEO tenure and Institutional Ownership. Governance control variables include G-index, Board Size, and Board Independence. All variables are defined in the appendix. Standard errors are clustered by industry, and t-statistics are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is denoted by ***, **, and *, respectively.

Panel A: CEO Turnover and Tariff Changes

	Tunover	Tunover	Tunover	Tunover	Tunover	Tunover
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Cut	0.691***	0.807***	0.736***	0.808***	0.837***	1.046***
	(6.58)	(6.05)	(4.03)	(6.10)	(5.85)	(5.12)
Increase	0.672***	0.615**	0.697***	0.912***	0.979***	1.189***
	(3.46)	(2.55)	(2.66)	(4.97)	(4.18)	(5.70)
Marginal Effects for Cut			0.044***			0.076***
Marginal Effects for Increase			0.041***			0.086***
Controls		Y	Y		Y	Y
Goveranance Controls			Y			Y
Industry FE	Y	Y	Y			
Year FE	Y	Y	Y			
Industry#Year FE				Y	Y	Y

Panel B: CEO Experience and CEO Turnover around Tariff Changes

Variable	Turnover (1)	Turnover (2)	Turnover (3)	Turnover (4)	Turnover (5)	Turnover (6)
Cut * Exp_Cut	-11.22***	-6.632***	-6.673***	-0.809**	-4.713***	-5.091***
	(-8.06)	(-6.32)	(-7.56)	(-1.97)	(-13.08)	(-10.89)
Increase * Exp_Increase	-10.28***	-7.793***	-9.265***	-3.427***	-5.179***	-5.790***
	(-3.60)	(-11.17)	(-5.06)	(-13.87)	(-4.87)	(-4.71)
Cut	28.20***	27.54***	8.763***	6.344***	12.84***	7.275***
	(6.44)	(10.11)	(5.99)	(11.02)	(6.61)	(3.91)
Increase	9.945***	20.66***	18.09***	0.439	6.625***	8.861***
	(5.40)	(14.05)	(15.11)	(0.56)	(5.22)	(4.83)
Marginal Effects for Cut * Exp_Cut			-0.107***			-0.039**
Marginal Effects for Increase * Exp_Increase			-0.116***			-0.037*
Controls		Y	Y		Y	Y
Goveranance Controls			Y			Y
Industry FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y			
Industry#Year FE				Y	Y	Y