Product Market Competition Shocks, Firm Performance, and CEO Turnover[*]

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Abstract

We examine the effects of competition shocks induced by major industry-level tariff cuts on chief executive officer (CEO) turnover decisions. We find that both the likelihood of CEO turnovers and the sensitivity of turnovers to firm performance increase for forced turnovers, when governance is weak, and when firm productivity is low. Performance and productivity improve after forced turnovers relative to a matched sample of firms that do not experience turnover. These results are consistent with organizational responses to more intense competition -- including the weeding out of inefficient management -- that improve productivity and performance. We also find that voluntary turnovers increase in response to more intense competitive pressure, consistent with preferences for a quiet life or with predictions of competitive assignment models. However, we do not find strong evidence that performance changes after voluntary turnovers.

1. Introduction

Since Adam Smith, economists have believed that competition not only is essential for efficient resource allocation, but also is a fundamental driver of productivity growth. However, surprisingly little evidence exists that competition improves productivity or efficiency. Nickell (1996), for example, states that empirical support for the notion that competition improves corporate performance is, at best, weak. Nickell examines a panel of UK manufacturing firms and finds that more competition, as measured by changes to firm-level rents, leads to more productivity growth. Subsequent work, however, has mainly focused on *organizational responses* to changes in competition that could be associated with greater productive efficiency. These organizational responses include greater decentralization (Bloom, Sadun, and Van Reenen, 2010), technological upgrades (Bustos, 2011), and higher incentive pay for top executives (Cuñat and Guadalupe, 2009).

In this paper, we examine a particular type of organizational response to a change in the competitive environment, namely, top management change. Specifically, we are interested in knowing whether more intense product market competition weeds out less efficient management and whether such managerial turnover is associated with subsequent improvements in performance and productivity. Accordingly, we examine whether more intense competition affects chief executive officer (CEO) turnover and the sensitivity of CEO turnover to firm performance, and whether such effects are more evident in firms that are less efficient and where agency problems are likely to be more severe. Using major industry-level tariff cuts as a quasi-natural experiment to capture changes in the degree of competition in an industry, we find that both CEO turnover and the sensitivity of turnover to a firm's operating and stock market performance increase after tariff cuts. Consistent with the idea that more intense competition weeds out less efficient management, we find that these effects exist for a sample of turnovers classified as "forced" turnovers, and for firms that perform poorly relative to their industry counterparts prior to the tariff cut, and they are stronger (or exist only) for firms that have weaker governance and have lower productivity than their counterparts. Moreover, subsequent to CEO turnover, performance and productivity improve in these firms relative to matched firms that have the same

propensity to experience a turnover (but a turnover does not occur). However, we are careful not to claim a causal link between CEO turnover and performance improvements. CEO turnover in response to more competitive pressure could simply represent an organizational response to more intense competition that also leads to performance improvements.

Why should more intense competition cause more disciplinary turnovers? One possibility is that corporate boards become more proactive when threatened with firm survival (e.g., out of reputational concerns) and fire inefficient managers who have been underperforming prior to the tariff cut. In fact, one of the main supposed benefits of competition is that it winnows out inefficient firms or managers.[1] The sensitivity of turnover to performance is also expected to increase as a result of stiffer competition. This might happen for two important reasons. First, firm performance conveys information about managerial type. A board may update its posterior assessment that a manager is of poor quality after observing a given magnitude of underperformance relative to peers. However, because managerial quality is likely to matter more for firm survival in a harsher competitive environment, the threshold for quality may be higher. This implies that the same relative underperformance increases the likelihood that the CEO is fired. Second, the quality of information conveyed by underperformance may change when competition is tougher. For example, when all managers in the industry are shirking, a given underperformance may not convey as much meaningful information about the quality of a particular manager as when they are all working hard.[2] For either of these reasons, a board that is proactive may be more likely to fire a manager for underperformance; i.e., the sensitivity of performance to turnover could increase with a positive shock to competition.

Disciplinary turnovers in response to more intense competition thus are most likely to occur when the current manager is of low ability and either is more entrenched or has poorer outside opportunities, which makes it less likely that the manager quits as part of the normal turnover process in the managerial labor market. Disciplinary turnovers are more likely following tariff cuts when prior performance has

[1] Competition is also supposed to align the incentives of managers, on which there is a growing literature. We discuss this literature briefly in Section 2.
[2] See Jenter and Kanaan (2010) for a similar argument.

been poor and when a board's and the market's perception of the manager's ability are already low. Also, firms with weaker boards are more likely to have inefficient managers who have not been weeded out in the past. These firms, therefore, experience more disciplinary turnovers following tariff cuts as their boards become more proactive and fire managers when threatened with competition. Furthermore, firms that are less productive within an industry are the ones that would benefit the most from a CEO change. Hence, CEO departures in such firms in response to competition are more likely to represent board proactivity rather than voluntary departures, as managers may have few good outside options.

More intense competition could also have less beneficial consequences for the firm's shareholders via top management change. For example, top managers may leave voluntarily (that is, for non-disciplinary reasons) for other firms or industries, because their marginal productivities are going to be lower in their existing firms facing more intense competition.[3] Related is that top management may leave because a quiet (or quieter) life elsewhere becomes more attractive, or because the survival of their current firm is threatened. In these circumstances, the firm may have to be run by a less talented manager whose outside options are less attractive. We find that turnovers classified as "voluntary" (following standard practice) also significantly increase after tariff cuts, and managers who leave are more likely to move to other industries relative to normal times.[4] However, we find weak or no evidence that when turnover is voluntary, performance or productivity of these firms decreases after turnover relative to matched firms, that is, that the affected firms are unable to effectively replace and departing managers because of adverse industry conditions.

Frèsard and Valta (2012, 2014) find that the effects of tariff cuts on corporate policies (e.g, investment and financing activity) are strongest on industry laggards, and there is almost no effect on

[3] A permanent leftward shift of the demand curve for domestic US firms associated with greater import penetration is equivalent to a decrease in the market value of the average firm, or what would be called firm "size" in competitive assignment models of the CEO labor market, as in Gabaix and Landier (2008) or Tervio (2008). In these assignment models, more talented managers are assigned to firms of larger size, where their marginal productivities are higher. Tariff cuts would cause a reassignment of CEOs throughout the economy, with CEOs of firms in the industry experiencing the tariff cut moving to other firms (within or outside the industry) of larger size.

[4] We find that CEOs in industries affected by tariff cuts are less likely to accept a higher paying job or an executive position in a larger firm than they would in normal times. These results are consistent with these CEOs having a preference for a quiet life.

industry leaders. Consistent with their findings, we find the effects of tariff cuts on CEO turnover and the performance sensitivity of CEO turnover are confined to firms in an industry that are more financially constrained, have smaller market share, and experience more information asymmetry (suggesting more vulnerability to predation). We find no significant effects of tariff cuts on CEO turnovers or the performance sensitivity of turnovers for firms that are less financially constrained or have larger market share or experience less information asymmetry within industry. These results have two implications. First, boards are pressured to force out poor managers only when firm survival is threatened, which is more typically the case for smaller, more financially constrained firms. Second, since many smaller, innovative firms are classified as financially constrained because they face difficulty in raising external finance due to information asymmetry, it appears that tariff cuts also trigger voluntary turnovers, with managers leaving for more stable firms where they can be more productive and have a quieter life. Indeed, for the entire increase in CEO turnover rates following tariff cuts among these vulnerable firms to be forced, the magnitude of the disciplinary effect would have to be implausibly large.

Our empirical strategy follows other recent papers that exploit the tariff cuts as quasi-natural experiments (e.g., Feenstra, 1996; Feenstra, Romalis, and Schott, 2002; Frésard, 2010; Valta, 2012; and Frésard and Valta, 2014) that reduce the cost of entering US product markets substantially and allow foreign companies to gain greater access to the US market, thus shifting the competitive landscape faced by US domestic firms.[5] As we argue below, it is very unlikely that the tariff cuts we study are endogenous to factors that could cause managerial turnover, such as declining prospects in industries that cause governments to "give up" on these industries in return for corresponding benefits for exporters. This allows us to make a causal interpretation of our findings on the effects of competition shocks on CEO turnover. The above-mentioned studies also provide detailed supporting evidence and arguments regarding the exogeneity of tariff cuts to certain corporate decisions. We provide additional evidence that the cuts are unrelated to industry conditions, and reproduce our results for subperiods during which the

[5] Tybout (2003) provides an excellent survey on how increased foreign competition reduces domestic markups and raises competition in general. See also, e.g., Baldwin (1988), Baldwin and Krugman (1989), Dixit (1989), Trefler (1993), Lee and Swagel (1997), and Bernard, Jensen, and Schott (2006).

cuts are the outcomes of more in the spirit of across-the-board reductions in tariff rates resulting from multilateral trade agreements, and thus less likely to be in response to conditions in a specific industry.

Taking advantage of the different timing of these cuts across industries, as well as industries without any cuts during our sample period, we adopt a difference-in-differences approach to examine the relation between competition and CEO turnover, as well as how the sensitivity of CEO turnover to firm performance is affected after the tariff cuts.[6] In our empirical tests, we focus on the five-year period starting the year after the tariff cut as the relevant post-tariff period to study the effects of more intense competition on turnover. We believe this is appropriate as, once the industry has adjusted to shocks and settled into a steady state, there should be no further effects. However, our main results are robust to alternative definitions of the post-tariff period.

Our results are economically significant. We find that, in the five-year period immediately following major tariff cuts, the likelihood of annual CEO turnover in the affected industry increases by 4 percentage points relative to other periods. The frequency of annual turnover in years that exclude the five-year period immediately after major tariff cuts is 11.23% in our sample, implying that the tariff cuts lead to a 34% increase in the probability of turnover or a decrease in the five-year survival rate from 55% to 44%. We also find that turnover becomes more sensitive to operating performance, though not to stock returns.

When we classify turnovers based on whether they are described as "forced" or "voluntary," we find that the likelihood of a departure increases for both categories, but only forced turnovers are more sensitive to both operating and stock performance. The annual likelihood of forced turnovers increases from 3.37% to 4.37% in the five years immediately following major tariff cuts, which represents almost a 10% increase in the overall turnover rate and a 30% increase in that for forced turnovers. In contrast, the likelihood of voluntary turnovers increases from 7.86% to 10.56%, a 24% increase in the overall turnover

[6] In all our tests, we control for prior trends in the industry by including an indicator variable (*Before*) that takes a value of one either one or two years prior to the major tariff cut in the industry and zero otherwise. We also control for the interaction of this variable with firm performance. Both the indicator variable and its interactions are insignificant in all our tests. We replicate our key results in the context of a linear probability model incorporating fixed firm effects, which further addresses endogeneity concerns related to tariff cuts.

rate and a 34% increase in that for voluntary turnovers. Thus, while the effects appear more substantial in absolute terms for voluntary turnovers, it is very likely that forced turnovers boost the numbers for the voluntary turnover sample. This is because, as pointed out by Kaplan and Minton (2012) and Jenter and Lewellen (2010), the standard algorithms potentially misclassify forced turnovers as voluntary. Because our primary objective is to demonstrate that forced or disciplinary turnovers are responsive to increased competition, the main consequence of this possible misclassification is that we underestimate the frequency of forced turnovers and the marginal impact of major tariff cuts on the probability of such turnovers.[7] When we partition firms based on various measures of governance, we find that the marginal effect in the poor governance subsamples can be as high as a 7 percentage point increase in the turnover rate following the tariff cut, which is large compared with the benchmark turnover rate of 11.23% in other years in our sample.

We believe our paper is the first one to examine the effect of shocks to competition on CEO retention decisions. It is related to three recent papers. Cuňat and Guadalupe (2009) examine the effect of more intense import competition on executive compensation and hiring decisions. They find that managerial pay and pay-performance sensitivity increase subsequent to greater import penetration. Pay differentials between executives also go up, driven partly by firms hiring more talented top managers. Our results provide evidence of a related response of firms to greater competition. While Cuňat and Guadalupe (2009) document that firms incentivise managers they want to keep, we find that they also proactively fire managers and lose managers who prefer to work in other industries. Presumably, such managers are replaced by more talented managers, consistent with these authors' findings.

Both Jenter and Kanaan (2010) and Kaplan and Minton (2012) examine the sensitivity of turnover to stock performance. Jenter and Kanaan (2010) examine forced turnovers, and Kaplan and Minton (2012) study all internal (standard) turnovers as well as turnovers due to mergers and bankruptcy or delistings. Both papers find that turnover is negatively related to market-adjusted stock performance. An

[7] We modify the standard algorithm by adding a criterion for identifying forced turnovers. This allows us to classify many more turnovers as forced. We discuss this later in more detail.

interesting result is that turnover is more sensitive to both firm-specific and industry-induced performance when industry performance is poorer. Jenter and Kanaan (2010) conclude that this could reflect the fact that boards learn more about CEO type when the environment is tougher or that they misattribute poor firm performance to poor CEO ability when, in fact, it represents an adverse industry shock.

Our study is related to these two papers in that tariff cuts correspond to sharply worse industry conditions. We examine turnover response to tariff cuts and to benchmark-adjusted performance (as we control for both industry and year fixed effects). Notably, whereas the above-mentioned studies consider only stock return performance, we examine both operating and stock return performance, and we find highly consistent results. The higher turnover response to the tariff cut, per se, could reflect inadequate filtering or attribution bias. However, it is hard to explain why the board's attribution bias should be evident only for firms with worse governance or more financial constraints. In contrast, all our results are consistent with the notion that retention decisions in a tougher environment are determined by more stringent thresholds and more learning about CEO ability based on performance.

Our results based on the exogenous competition measure of import tariff cuts on retention complement the prior findings of DeFond and Park (1999) based on the Herfindahl–Hirschman Index (HHI), which were shown to be not robust to alternative constructions of the HHI (Ali, Klasa, and Yeung, 2009). The quasi-natural experiment of exogenous change in tariff rates arguably provides a cleaner measure of change in competitive conditions to address this important issue. Moreover, when regulators formulate competition policy, they are more likely to be concerned about the effects of changes to competitive conditions within an industry instead of cross-industry comparisons. Our design directly addresses this issue and suggests that shocks to competition can have important effects on firms' managerial retention decisions, which in turn likely affect their ability to cope with these shocks. Not all our evidence indicates that competition removes the least efficient. While more competition does weed out managers of the least productive firms and causes boards of poorly governed firms to become more proactive, it also leads to the departure of managers of financially constrained firms that are less able to

cope with competition, not because they are less efficient but because less information about their firms is in the public domain.

The rest of our paper is organized as follows. Section 2 discusses the related literature and hypotheses. Section 3 describes the data. Sections 4 and 5 present the main empirical results. Section 6 discusses robustness checks, and Section 7 concludes.

2. Related Literature and Hypotheses

We now present a brief review of the relevant literature and then proceed to develop our hypotheses.

2.1 Literature Overview

The idea that competition, by ensuring survival of the fittest, improves efficiency has a long history. We do not attempt to review that literature here. Instead, we focus mainly on the literature on CEO turnovers. In the hypothesis development, we discuss how product market competition could affect CEO turnovers.

2.1.1 Competition and Retention

While there is an evolving literature on the effect of competitive conditions on the provision of (effort) incentives, CEO retention decisions have been modeled more as learning about CEO type based on performance or other signals: Firing occurs if the posterior on the CEO's ability falls below a threshold. [8] Retention decisions as incentive schemes and their response to change in competition remain relatively unexplored.[9] One argument for why more competition can improve inference about CEO ability is that the presence of more market players can make it easier to filter out common shocks better, which may lead to an increase in the usage of relative performance evaluation (e.g., Holmstrom, 1982; and Nalebuff and Stiglitz, 1983). [10]

2.1.2 Turnover and Performance Sensitivity of Turnover

[8] See, for example, Hart (1983), Scharfstein (1988), Hermalin (1992), Schmidt (1997), and Raith (2003).

[9] However, if both effort and ability affect performance, and thus inference about ability, then retention decisions also affect the CEO's effort incentives. Therefore, incentive contracts may have to be designed to allow for better inference of ability. How competition affects such incentive contracts remains an unexplored issue.

[10] Jenter and Kanaan (2010) note that the theoretical literature does not consider CEO retention or firing decisions as mechanisms for incentive alignment but rather as one of ensuring that the right person is at the helm. We discuss this further below.

How the unconditional survival likelihood of CEOs has changed over time is of interest, in part because the nature of corporate governance, shareholder activism, and public attitudes toward CEO pay have also evolved.[11] Kaplan and Minton (2012) study CEO turnovers from 1992 to 2007 for a sample of large US public firms and find that turnover increased and the average tenure of the CEO decreased in the post-2000 period.

Much of the attention, however, has focused around the sensitivity of turnover to performance. The motivating theoretical framework is that the board learns about the CEO's ability based on past performance and that it filters out any component common to the firm in question and other firms by comparing the firm's performance with that of industry peers.[12] This gives rise to relative performance evaluation, and the CEO is retained if and only if the posterior assessment of the CEO's ability exceeds the expected ability of a replacement CEO.

Prior literature finds evidence of turnover-performance sensitivity (Murphy, 1999; and Jensen, Murphy, and Wruck, 2004). However, the implied changes in the probability of turnover in response to a change in relative performance are rather weak.[13] In a more recent study, Kaplan and Minton (2012) find larger relative performance sensitivities, which are the highest for the post-2000 period. Kaplan and Minton (2012), unlike authors of some earlier studies, do not focus only on forced turnovers, because they argue that many forced turnovers are misclassified as voluntary. Based on a similar argument but a different empirical methodology, Jenter and Lewellen (2010) examine all internal turnovers and estimate substantial turnover-performance sensitivities.

A related issue in this literature is the role of performance benchmarks. The theory of retentions suggests that the benchmarks should be filtered out and they should not have any effect on turnover decisions. However, both Kaplan and Minton (2012) and Jenter and Kanaan (2010) find that turnover is also sensitive to the benchmark, suggesting incomplete filtering. Jenter and Kanaan (2010), for example,

[11] See, for example, Huson, Parrino, and Starks (2001), Holmström and Kaplan (2001), Hermalin (2005), and Kaplan (2008) for evidence that corporate governance has improved since the 1970s.
[12] See Holmström (1982) and Gibbons and Murphy (1990).
[13] See, for example, Warner, Watts, and Wruck (1988), Weisbach (1988), Jensen and Murphy (1990), Denis, Denis, and Sarin (1997), Murphy (1999), and Huson, Parrino, and Starks (2001).

find that turnover is more sensitive to both firm-specific and industry-induced performance when industry performance is poorer. Jenter and Kanaan (2010) conclude that this could reflect the fact that boards either learn more about CEO type when the environment is tougher or misattribute poor firm performance to poor CEO ability when, in fact, it represents an adverse industry shock.

A final issue in the turnover-performance literature concerns the role of the quality of governance. Earlier literature provides, at best, weak evidence that better corporate governance increases the sensitivity of CEO turnover to performance. A variety of governance proxies have been examined in the literature, including the G-Index (Gompers, Ishii, and Metrick, 2003), shareholder blockholdings, board independence, board size, equity ownership by directors, and institutional ownership. Kaplan and Minton (2012) find that the presence of independent directors and blockholding increases the performance sensitivity of turnover. Jenter and Lewellen (2010), using a new methodology to measure performance sensitivity, find much more significant effects. Over the first five years of tenure, the difference in turnover probabilities between top and bottom quintile performers is 73 percentage points for strong boards (defined as small boards with a majority of independent directors and high director ownership), but only 30 percentage points for weak boards.

2.2 Hypotheses

More intense competition due to a tariff cut is best thought of as a leftward shift of the demand curve (residual demand) for existing firms in the industry. We are interested in how such a shift affects both CEO turnover and the sensitivity of turnover to performance and, in particular, relative performance.

A permanent leftward shift of the demand curve for domestic US firms is equivalent to a decrease in the market value of the average firm, or what would be called firm "size" in competitive assignment models of the CEO labor market, as in Gabaix and Landier (2008) or Tervio (2008). In these assignment models, more talented managers are assigned to firms of larger size. Thus, in frictionless assignment models without agency problems and perfect congruence of shareholder and managerial objectives, tariff

cuts would cause a reassignment of CEOs throughout the economy, with CEOs of firms in the industry experiencing the tariff cut moving to other firms (within or outside the industry) of larger size.[14]

In practice, however, many frictions might violate the assumptions underlying these competitive assignment models. These frictions include information asymmetry about managerial talent, managerial objectives such as preference for a quiet life, or empire building, board capture, and other frictions related to search in the labor market. Thus, while some departures are likely outcomes of the forces or the managerial labor market, and therefore are voluntary in nature, others may reflect frictions of the type discussed above. Manager and board behavior, therefore, are likely to reflect considerations that go beyond the implications of frictionless assignment models.

Consider managers first. A substantial literature in corporate finance postulates that managers have a preference for a quiet life and would rather be at a firm or in an industry in which they do not have to work hard (Bertrand and Mullainathan, 2003). When competition intensifies, managers may want to look for opportunities in other industries. A closely related argument is that managers may want to quit voluntarily simply because the survival likelihood of their firms deceases with a tariff cut–induced increase in the intensity of competition. Moreover, unlike standard assignment models that emphasize only one type of managerial skills, some skills – such as "cost-cutting" skills -- may be more valuable when competition becomes stiffer than other types of skills, e.g., "growth-promoting" skills. Thus, managers whose skills become less relevant may prefer to move to other industries. Together with the implications of the competitive assignment models, these additional considerations all suggest that managerial turnover increases for voluntary reasons when competition intensifies due to tariff cuts.

Managers may also have imperfect knowledge about their own abilities or the challenges they face in a new environment after the tariff cut. They may learn about both these aspects from the performance of the firm after the tariff cut and may be more likely to leave after poor relative-to-industry performance. Also, they may learn more from the same relative performance in a more competitive

[14] To the best of our knowledge, Eisfeldt and Kuhnen (2013) is the only paper that studies how shocks to industry affect competitive assignment.

environment, when all managers are exerting more effort, than when there is more slack. Finally, the same underperformance may be perceived as a more negative signal about the prospects of survival in a more competitive environment. Therefore, voluntary departures are also expected to be sensitive to performance, and more so after the tariff cuts.

Next, we turn to corporate board's likely response to more intense competition induced by tariff cuts. Here, the departures from the implications of competitive assignment models are quite stark. Low-ability managers, or managers whose skills sets are obsolete, may survive when they are entrenched. Because their outside opportunities may not be very good, even the pressure of competition may not compel them to quit as long as they enjoy protection from the board. However, if boards are concerned about the damage to their reputations when firm survival is threatened, then they are likely to make decisions that would ensure firm survival. Such decisions might involve bringing in a different manager either of higher ability or with a different set of skills (e.g., one who is a specialist at cutting costs or restructuring rather than fostering growth). Also, boards, in general, could tolerate some inefficiency when times are good but toughen up when survival is threatened. These types of replacement decisions reflect an upward adjustment of ability thresholds above which managers are retained when the tariff cut occurs, together with updating of priors on managerial ability or survival likelihood based on performance after the cut. [15] Thus, such turnovers, which would typically be in the nature of forced turnovers, would increase following the cut and would also be more sensitive to performance after the cut.

The above arguments lead to testable Hypothesis 1.

H1. *(a) Tariff cuts will lead to more (voluntary as well as forced) CEO turnover for firms in the industry over some period of time immediately after the cut (relative to other periods).*

(b) Tariff cuts will be associated with greater sensitivity of turnover to benchmark-adjusted performance over some period of time immediately after the cut (relative to other periods).

[15] The threshold is best thought of as a cutoff value of the posterior probability assessment that a manager is of high ability, such that the manager is retained if and only if the posterior assessment exceeds the threshold.

(c) Turnover and performance sensitivity of turnover will increase more over some period of time immediately after the cut (relative to other periods) for firms facing greater competitive pressure from rivals (e.g., those with products that are more similar to competitors or that are less unique) than for those facing less pressure.

Our arguments suggest that both voluntary and forced turnovers are consistent with H1 (a) – H1 (c). It is important to further investigate whether the evidence is consistent with both types of turnover occurring subsequent to the tariff cuts, since the efficiency implications of these two types of turnovers could be very different. This exercise is not straightforward, however, since it is difficult to directly determine whether a departure is truly voluntary. Kaplan and Minton (2012) and Jenter and Lewellen (2010) argue that standard algorithms to classify departures as voluntary versus forced are highly imperfect and, in fact, turnovers classified as voluntary might be forced.[16]

We first consider forced turnovers. While there is concern regarding the validity of classification of turnover using standard algorithms, there is little concern that the forced turnover sample includes voluntary cases – the concern is the other way around. Hence, we directly test whether, for the forced turnover sample formed using standard algorithms, the turnover likelihood and sensitivity of turnover to performance are higher after the cut than in other periods.

Second, we examine whether the turnover likelihood and sensitivity of turnover to performance are higher for the sample of past underperformers after the cut than in other periods. Evidence exists that the managerial labor market draws inference about managerial ability from the past performance of the firm under a manager (Fee and Hadlock, 2003; and Chang, Dasgupta, and Hilary (2010); that is, past performance correlates positively with (perceived) ability. Chang, Dasgupta, and Hilary find that past underperformers are unlikely to have good market opportunities and leave voluntarily.

[16] One reason for questioning the classification based on standard algorithms seems to be that turnovers classified as voluntary according to these algorithms also exhibit sensitivity to performance. However, our arguments suggest that when managerial learning is involved, turnovers can be performance sensitive even when they are not forced.

Third, we examine whether the quality of governance matters, which is an issue of independent interest. Except for a recent paper by Jenter and Lewellen (2010), attempts to find an effect of governance quality on the performance sensitivity of turnover have had limited success. This is in contrast to, for example, studies that document that the quality of governance has significant implications on performance, especially when product market competition is weak (Bertrand and Mullainathan, 2003; and Giroud and Mueller, 2010). Jenter and Lewellen (2010) use a new methodology and find that the quality of governance does make a major difference to this sensitivity. An implication of their finding is that firms with poor governance would be harboring CEOs of lower ability. Therefore, if reputation is threatened by lower likelihood of survival, then weaker boards would be more likely to become proactive and replace low-ability managers. Thus, we hypothesize that both the likelihood of turnover and the performance sensitivity of turnover will be higher after tariff cuts for weaker boards compared with stronger ones.

Finally, we examine if turnover and performance sensitivity of turnover increase more after the tariff cut for less productive firms (measured, for example, in terms of total factor productivity) than for more productive ones. This hypothesis is directly motivated by the idea that more competition weeds out the less efficient firms or managers. Less productive firms are also less likely to survive after more intense competition, and this could motivate managers to quit voluntarily. However, the outside opportunities for managers of unproductive (and hence underperforming) firms are likely to be limited, so their accelerated departures are more likely to be forced than voluntary.

H2. *Consistent with forced turnover, we expect that both CEO turnover and the sensitivity of turnover to performance will*

(a) Be higher for turnovers classified as "forced" immediately after the cut than in other periods,

(b) Be higher for the sample of prior underperformers immediately after the cut than in other periods,

(c) *Increase more immediately after the cut for firms with weaker governance than those with stronger governance , and*

(d) *Increase more immediately after the cut for lower-productivity firms than high-productivity firms.*

We next propose several hypotheses and corresponding empirical tests relating to how the incidence of voluntary turnovers and the performance-sensitivity of such turnovers should manifest after the tariff cuts. First, we examine whether turnover and the performance sensitivity of turnover is higher after tariff cuts for a sample of departures classified as voluntary using standard algorithms, although we recognize that such classifications are likely to misclassify many forced turnovers as voluntary.

Second, we examine the sample of past outperformers (firms that outperformed their industry benchmarks prior to the tariff cut) and whether turnover and performance sensitivity of turnover is higher during some time period immediately after the tariff cut than in other periods. Because more intense competition is unlikely to motivate corporate boards to fire perceived high-ability managers, a higher incidence of departures for the past outperformer subsample after the tariff cuts suggests that the frequency of voluntary departures increases. A similar argument applies if turnover for such managers shows higher performance sensitivity.

Finally, we examine whether tariff cuts are more likely to trigger turnovers and increase the performance sensitivity of turnovers for more vulnerable firms, consistent with Frèsard and Valta (2012, 2014), who find that investment and financing behavior of industry laggards are affected by tariff cuts, while those of industry leaders are unaffected. Since managers of smaller and younger firms are often more innovative and dynamic rather than inefficient, a higher turnover rate subsequent to tariff cuts for such firms also suggests that many of these departures are voluntary, with managers leaving for other firms where survival is more assured, where they can be more productive, and where they can have a quieter life. To this end, we compare whether departure rates and the sensitivity of turnover to firm performance increase more after the cut for firms that are more financially constrained, have lower market share, and are associated with more information asymmetry, than, respectively, their industry

counterparts. Firms that face more financial constraints are likely to find survival and growth even more challenging after the tariff cuts than before, compared with unconstrained firms. Thus, consistent with both quiet life and competitive assignment model arguments, CEOs of such firms are more likely to quit.[17] This incentive will be further reinforced by poor relative-to-industry performance, so that the performance sensitivity of turnover will also increase more for these firms.[18] Firms with more information asymmetry could become more vulnerable to predation by rivals (Bolton and Scharfstein, 1988) if the returns from costly predatory activity are higher for the rival firms when competition is more intense.[19] Finally, a similar argument applies to firms with small market share, because these firms have fewer established brands, less market power, and lower margins and, thus, are less likely to compete successfully. Thus, we have the following hypotheses:

H3. *We expect that both CEO turnover and the sensitivity of turnover to performance will*

(a) Be higher for turnovers classified as "voluntary" immediately after the tariff cut than in other periods,

(b) Be higher for the sample of prior outperformers immediately after the cut than in other periods, consistent with voluntary turnovers

(c) Increase more immediately after the cut for financially constrained firms than for unconstrained firms,

[17] Financial constraints also could, in theory, reflect agency problems related to potential for investment in bad projects. Therefore, managerial turnovers in financially constrained firms could be consistent with disciplinary turnovers. However, the empirical proxies for financial constraints, such as firm size or the availability of a bond rating, capture adverse selection-related constraints. To invest in bad projects and be subject to discipline, firms need enough internal and external financing to exhaust all good projects, a requirement that is unlikely to be met by these firms.

[18] Performance sensitivity of turnover can increase after the tariff cut relative to other periods because of a more competitive environment, as argued previously. However, it is less clear why this effect will be stronger for financially constrained than for unconstrained firms. Higher increase in performance sensitivity for financially constrained firms compared with unconstrained firms is consistent with the same underperformance pushing managers of the former firms below an already higher threshold for voluntary departure.

[19] The return from predation decreases if there are more players, because the benefit of driving out a rival is shared with more (free-riding) firms in the industry. However, the cost of predation also decreases if it is harder for the target of predation to survive when there is more competitive pressure.

(d) Increase more immediately after the cut for firms with more information asymmetry than those with less, and

(e) Increase more immediately after the cut for firms with low market share than for those with high market share.

Finally, the nature of the turnover likely will have implications for subsequent performance. For example, if the turnover is disciplinary, one would expect that performance would improve not only—or necessarily—because poor quality managers are forced out and replaced by better quality managers, but also because such turnovers could reflect an efficient organizational response to the challenge of competition. In contrast, for voluntary turnovers, there are no clear predictions.[20] Thus, we have the following hypothesis:

H4. *For forced turnovers, we expect performance to improve following the turnover relative to that immediately before, compared with a matched sample of firms with the same propensity for experiencing a turnover in the same year (but which does not experience any turnover).*

3. Sample and Data

To measure reductions in import tariffs at the [four-digit standard industrial classification (SIC)] industry level, we use product-level US import data compiled by Feenstra (1996), Feenstra, Romalis, and Schott (2002), and Schott (2010). These data span the period 1992–2005 and cover 199 manufacturing industries (2000–3999 SIC range). For each industry-year, we compute the ad valorem tariff rate as the duties collected by the US Customs Service divided by the free-on-board value of imports. To identify

[20] One possibility is that some low-ability managers leave because they update their private assessments about their own abilities and anticipate being replaced. In such cases, performance could improve after the turnover if they are replaced by more capable managers. However, it is also possible that managers with better outside options depart as they perceive the survival likelihood of the firms to be lower with the onset of competition, leaving those with lower ability and worse outside options in charge. In this case, performance could deteriorate after turnover. This latter scenario is also consistent with departures related to quiet life preferences or with more capable managers being reassigned to firms in which their marginal productivities are higher, as implied by competitive assignment models.

sizable variation in barriers to trade, we follow Frésard (2010) to characterize tariff reductions in terms of the deviations in the yearly changes in tariffs from their median level. Accordingly, a tariff cut occurs in a specific industry-year when a negative change in yearly tariff rate is three times larger than its median change in the industry over our sample period.[21] Moreover, to make sure that large tariff reduction truly reflects non-transitory changes in the competitive environment, we exclude tariff cuts that are followed by equivalently large increases in tariffs over the subsequent two years.

We obtain CEO turnover data from the Standard and Poor's (S&P) ExecuComp database, which covers about 1,500 firms each year that are in the S&P 500, S&P mid-cap 400, and S&P small-cap 600 indices. In general, our sample period covers 1992 to 2005. We choose this sample period to match the tariff data. We include all firm-years that have an identifiable CEO (using CEOANN). We obtain stock return data from the Center for Research in Security Prices (CRSP) and firm characteristics from the Compustat Industrial and Segment files. Governance data are from RiskMetrics [formerly called Investor Responsibility Research Center (IRRC)]. After merging the tariff data with the CEO data from ExecuComp, we are left with 111 unique four-digit SIC industries. There are 77 industries experiencing at least one tariff cut during our sample period, with the remaining 34 industries experiencing none. We drop all industries for which we do not have tariff data.

While we mainly focus on the change of import tariff, the change of export tariff could be triggered at the same time as part of the bilateral (or multilateral) agreements between the United States and other countries. Thus, it is not obvious that the demand curve for exporting firms shifts left following the import tariff reduction as the export market can improve simultaneously. To address such concerns, we exclude all exporting firms. An exporting firm is defined as having positive export sales recorded in Compustat. On average, export firms account for 27.3% of the sample per year.[22]

We define turnover in a given fiscal year *t* to occur if the CEO in year *t* is no longer the CEO by the following year, *t+1*. We exclude all non-standard turnover, that is, turnover due to an acquisition or

[21] If the industry median is zero, then any negative tariff change is defined as a cut.
[22] In robustness checks reported in Section 6, we show that inclusion of exporting firms does not affect our results.

bankruptcy or delisting. Panel B of Table 1 presents the level of CEO turnover by year and by type. The turnover rate for standard turnovers, our focus (as in much of the literature), is 13.63%, and that for nonstandard turnovers due to acquisition and delisting is 3.06%.[23] The total turnover rate in our sample is 16.69% over the entire sample period, implying average CEO tenure of six years. Kaplan and Minton (2012) report a 15.6% turnover rate using S&P 500 firms for a slightly different sample period.

[Insert Table 1 near here]

Over the sample period, the tariff rate is 1.22%, but it can be as large as 29.64% for some sectors and zero for others. The substantial variation of tariff rate across industries can also be inferred from the large standard deviation of 2.11%. As prior literature shows that CEO turnover rate is negatively associated with firm performance, we use two measures for firm performance: return on assets (*ROA*) and one-year stock returns (*RET*). Other firm-level control variables are *Salechg,* annual sales growth from year *t*-1 to year *t*; *Assets,* the natural logarithm of firm's total assets; *Q* (which represents Tobin's q), the sum of market value of equity and market value of debt divided by replacement value; and *Volatility,* the standard deviation of firm's monthly stock return from year *t*-5 to year *t*-1.

4. Empirical Methodology and Results

We now explain our empirical methodology and discuss our results.

We first discuss the merits of our choice of industry-level tariff cuts as a quasi-natural experiment to avoid potential issues of endogeneity.

4.1.1 Tariff Cuts as a Quasi-Natural Experiment

In trying to understand how competition affects CEO turnover, the main challenge we face concerns finding measures of competition at the industry level that are exogenous to the effects, namely CEO turnover, that we wish to uncover. Traditional measures such as the Hirschman-Herfindahl Index are subject to endogeneity: competition could well be the outcome of CEO retention decisions, or both could

[23] See, for example, Huson, Parrino, and Starks (2001), Jensen, Murphy, and Wruck (2004), Murphy and Zábojnik (2004), and Jenter and Lewellen (2010).

be jointly determined, so the relationship need not be causal. For example, more efficient managers could drive out firms with less efficient ones in their industries, leading to more industry concentration, and may stay longer with their firms. In view of this, a number of recent papers have used industry-level major tariff cuts as quasi-natural experiments to study the effect of (change in) competition on corporate policies (e.g., Feenstra, 1996; Feenstra, Romalis, and Schott, 2002; Frésard, 2010; Valta, 2012; and Frésard and Valta, 2012, 2014). These papers contain excellent discussions as to why tariff cuts are a valid quasi-natural experiment in the context of the issues they address. While our dependent variable of interest is different, some of the same arguments apply.

In our context, perhaps the most important possibility to rule out is that the industry-level tariff cuts are not in response to factors that would also have caused heightened CEO departures in the absence of these cuts. Such a possibility would be plausible if the industries which experience tariff cuts happened to be declining industries, and politicians – perhaps influenced by exporter lobby groups seeking to open up foreign markets as part of reciprocal agreements – decided to open up to foreign competition markets and industries that would be difficult to salvage. To see if this is the case, and whether our results could be driven by such cases, we do several things. First, we directly see whether the major tariff cuts that occur in our sample period could be predicted by prior industry conditions or trends, such as growth of sales and earnings, market conditions, and so on. We find no supporting evidence. Second, we only consider for our empirical tests tariff cuts that were a part of multilateral trade agreements and were across-the-board, and thus not narrowly directed at particular industries. Our results hold for these tariff cuts, which in fact account for a majority of the tariff cuts in our sample period. Unlike the above-mentioned studies, our sample period begins in 1992, which is the first year since we are able to readily obtain information on CEO turnover decisions only since that year. Subsequent to 1992, a majority of the tariff cuts were the result of multilateral trade agreements. These results are discussed in detail in section 6.

There are good reasons to believe that these multilateral tariff cuts beginning in the early 1990s were the result of broad consensus in the US in favor of trade expansion. [24] There is no reason to believe, however, that lobby groups in declining industries would lobby to reduce tariff protection – in fact, theory and evidence suggests the opposite. Thus, most plausibly, the groups that benefited were exporters and importers of intermediate goods. While these groups benefited, those focused on domestic markets suffered. We exclude exporters and focus exclusively on firms that produce only for the domestic market in our empirical tests.

4.1.2 CEO Turnover and Tariff Cuts

We test H1(a) by estimating a probit regression of CEO turnover on our measure of competition.

$$Prob(CEO\ Turnover_{i,t}) = \delta \times CUT\_POST5 + \beta_0 \times PM_{t-1} + \gamma' X_{i,t-1} + \varphi_j + \gamma_t + \varepsilon_{i,j,t} \qquad (1)$$

The dependent variable is one if there is a CEO turnover event for a firm in a particular year and zero otherwise. Subscripts *i, j,* and *t* represent the firm, industry, and year, respectively. Our measure of competition is *CUT_POST*5, which is an indicator variable that is equal to one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. We use five years as the post-event window because we are interested in the response of firms in the industry to the shock, which is likely to occur soon after the incidence of the shock. [25] Further, any change in CEO turnover in the long run is likely to be influenced by many other confounding factors. The coefficient of interest is the effect of the competition shock, δ. This approach allows comparing the change in CEO turnover rate in industries that experienced a competitive shock in any of the previous five years with the change in CEO turnover rate in industries that do not experience a competitive shock in any of the previous five years. This approach is similar to a standard difference-in-differences approach used by Bertrand and Mullainathan (2003), because all industries do not experience a competitive shock at the same time. At any time *t*, the treatment group contains all firms in industries that experience a tariff cut. The control group is not restricted to industries

[24] See Destler, "American Trade Politics", 2005.

[25] For example, a firm may be able to find a CEO with the right set of skills for the new environment quickly, so no further adjustment is expected in the longer run in response to the shock.

that never experience a tariff cut. It implicitly takes as the control group all firms from industries not experiencing a tariff cut in the previous five years, even if they have already experienced a shock or will experience one later on. In all regressions, we also include industry (at the two-digit level) and year fixed effects, which is necessary to identify the within-industry and within-year change in CEO turnover rate between treated and untreated groups when competition intensifies.

Our performance measures (PM_{t-1}) are the firm's operating performance (return on assets, *ROA*) and stock performance (stock returns, *RET*) in the year prior to the turnover.[26] Because we control for industry and year fixed effects, our performance measures are essentially adjusted for same year and same industry benchmarks. We also include other control variables described in Table 1. We use a dummy variable indicating whether the CEO is age 65 or above. The standard errors are robust and clustered by two-digit SIC codes.

Panel A in Table 2 reports tests of H1(a). We run a baseline probit regression that includes only the firm performance and other control variables to make sure our results are in line with prior literature (Column 1). The two measures of firm performance, *ROA* and *RET*, are both negatively related to the CEO turnover likelihood, which confirms that CEO turnover often occurs after poor performance. We then add the dummy for tariff rate cut, *CUT_POST*5 (Column 2).[27] Consistent with H1(a), which states that the likelihood of CEO turnover is positively associated with the tariff rate cut, the coefficient on *CUT_POST*5 is significantly positive ($p < 0.01$). In terms of economic magnitude, holding other variables at the mean, CEO turnover likelihood increases from 11.23% in the periods excluding the five years after the tariff cuts to 15.23% during such periods, or a jump in unconditional probability of about 35% (= 4)/ 11.23), when an industry experiences a substantial tariff rate cut.

[Insert Table 2 near here]

[26] We also measure performance as the three-year average prior to the turnover. All our results are quantitatively similar.

[27] This also mitigates the misspecification problem that might arise if industry performance is not included as a control (Jenter and Kanaan, 2010).

To investigate the possibility of a similar trend in CEO turnover prior to the tariff cut, possibly related to industry trends to which the tariff cut could be endogenous, we create a dummy variable, *Before*, which equals one if the time period is one or two years before a specific industry experiences a substantial tariff reduction. [28] Adding this variable allows us to assess whether any change in CEO turnover can be found prior to the increase of industry competition. Finding such an effect in a time period other than the event window can also be regarded as a symptom of a tariff cut being anticipated, which challenges the exogenous nature of competition shock. We replicate the regression in Column 2 by adding this dummy variable in Column 3. We find that its coefficient estimate is insignificant.

We next test H1(b) by adding an interaction term between the tariff cut dummy and two performance measures (*PM*). Hence, Eq. (1) changes to

$$Prob\left(CEO\ Turnover_{i,t}\right) = \delta \times CUT\_POST5 + \beta \times CUT\_POST5 \times PM_{t-1}$$
$$+\beta_0 \times PM_{t-1} + \gamma' X_{i,t-1} + \varphi_j + \gamma_t + \varepsilon_{i,j,t} \quad (2)$$

If CEO turnover is more sensitive to past performance after the tariff cut, we would expect the coefficients (betas) on the interaction terms $CUT\_POST5 \times PM_{t-1}$ to be negative and significant. In such a specification, the sensitivity betas pick up within-industry variation in turnover to firm performance and, thus, are even less likely to be subject to the concern that tariff cuts are endogenous to industry conditions.[29]

The results in Column 4 confirm that the sensitivity of CEO turnover to firm performance increases after the tariff cut as both interactions turn out to be negative though not significant. To control for potential trend prior to the cut, we add an interaction term between *Before* and two relative

[28] In Section 6, we directly address the issue of exogeneity of tariff cuts to industry conditions by showing that tariff cuts cannot be predicted on the basis of industry conditions such as capital expenditures or sales growth. We also reestimate our main models on the post–World Trade Organization period, during which tariff cuts were mostly multilateral in nature and less likely to be influenced by specific industry conditions, and for tariff reduction years that involved an above-median number of industries subject to tariff cuts.

[29] Our industry dummies are at the two-digit SIC level. However, if common industry trends influence tariff cuts, then all industries that share the same two-digit code likely are affected, and such common trends likely are filtered out, leaving only the effect of the tariff cuts.

performance measures (Column 5). The interaction between *CUT_POST*5 and *ROA* is -0.752, significant at the 5% level, and the interaction between *CUT_POST*5 and *RET* is insignificant.

Ai and Norton (2003) point out that the marginal effect of the two interacted variables is not equal to the marginal effect of changing just the interaction term when the model is nonlinear. To gauge the marginal effect of the interaction term in Columns 4 and 5, we need to compute the cross-derivatives or cross-differences of the expected probability of CEO turnover with respect to *CUT_POST*5 and firm performance, while keeping other covariates in the model constant. We present the corrected marginal effects in Table 2.[30] While the marginal effect (not reported in Table 2) of a decrease in *ROA* by 10 percentage points in any year translates to a 0.28% increase in the probability of a CEO turnover (Column 1), as reported in Column 5, this increases to 1.21% in any year when the firm faces more competition via major tariff cuts. This is significant economically because the turnover rate in the overall sample outside of the post-cut years is about 11%.[31]

4.2 Product Substitutability

In this subsection, we examine the relation between tariff reduction and CEO turnover when firms are likely to face more competitive pressure from rivals. H1(c) maintains that firms with greater competitive pressure from rivals will experience more CEO turnover and performance sensitivity of turnover after the tariff cut.

To measure competitive pressure from rivals, we use two firm-level proxies: product similarity and research and development (R&D) expenditure. The product similarity measure is based on Hoberg and Phillips (2011). Combining webcrawling and text-parsing algorithms that process the text of product descriptions in 10-K annual filings, Hoberg and Phillips calculate the firm-by-firm pair-wise similarity

[30] We use STATA command *inteff* to compute the correct marginal effect of interaction terms in all our probit models.

[31] In Tables B2 and B3 in the Appendix, we present our major results in the context of a linear probability model. While linear probability models have some shortcomings, one major advantage is that they allow us to incorporate firm fixed effects. Moreover, the marginal effects are easy to compute and interpret relative to non-linear models, especially for interaction terms. All our major results remain qualitatively unchanged and significant.

scores.[32] We expect that firms whose products are more similar or less specific to the firm face more pressure from the product market. Sutton (1991) and Shaked and Sutton (1987) suggest that firms use R&D to differentiate their products from those of competitors. This product differentiation makes it more expensive and difficult for rivals to compete. So our second proxy is firm's R&D expenditure. For each proxy, we partition our sample firms into two groups depending on whether the competition proxy in the year before is above or below the industry mean. We then run the same probit regressions as in Table 2 for each of the two subgroups separately to examine the effect of a tariff cut on the CEO turnover during the subsequent five years.[33]

The results in Table 3, Panel A, examine the frequency of CEO turnover. For each proxy, the first column (Columns 1 and 3) comprises firms facing less competition; the second column (Columns 2 and 4), those facing more competition. Overall, the coefficient on *CUT_POST5* is significantly positive only in Columns 2 and 4 and insignificant in Columns 1 and 3. For example, the coefficient of *CUT_POST5* is 0.379 and significant at the 1% level for firms whose products are more similar to those of their peers. The Wald test indicates that the difference across the two groups is also statistically significant. In Panel B, we add an interaction term between *CUT_POST*5 and two performance measures to examine the effect of competition pressures on turnover-performance sensitivity. We then perform the subgroup analysis for each of the two proxies. We find that the coefficient on the interaction between *CUT_POST*5 and both the firm performance measures is significantly negative only for the firms facing more competition pressure. We also calculate the marginal effects of the interactions and find that they are significant only for the subgroups facing more competition before the cut. Overall, we provide evidence that for firms with less unique or more similar products to those of competitors, more intense competition creates stronger incentives for survival. As a result, both the frequency of CEO turnover and the sensitivity of CEO turnover to performance change dramatically after a substantial industry tariff cut.

[32] For firm *i*, Hoberg and Phillips subtract a minimum threshold from each pair-wise similarity score between firm *i* and all the other firms and then sum up the resulting differences if they are above zero to obtain the Hoberg and Phillips total similarity index for firm *i*. The index would generally change every year, given the changes in product descriptions of firm *i* or in firms with products similar to firm *i*.

[33] The partition is done at year *t*-1, the cut is in year *t*, and the turnover is examined from year *t*+1 to year *t*+5.

[Insert Table 3 near here]

4.3 Voluntary and Forced Turnover

In Subsection 4.1, we show that both the level of CEO turnover and the sensitivity of CEO turnover to performance increase following tariff cuts. We do not make a distinction between voluntary and forced turnovers. However, both types of turnovers are expected, although the mechanism behind each type of turnover might be different. For example, voluntary turnover can increase if the CEO prefers a quiet life when it is more difficult to deliver good performance in a more competitive environment. Due to increased pressure from the product market, the board of directors may proactively fire a poor-quality manager to give the firm a better chance of survival. To more clearly identify the mechanism through which CEO departure rates increase following tariff cuts, we need to separate CEO turnovers into two categories: voluntary and forced. Following Parrino, Sias, and Starks (2003), a succession is classified as forced if the *Wall Street Journal* reports that the CEO is fired, is pushed from the position, or departs due to unspecified policy differences. For the remaining cases, the succession is classified as forced if the departing CEO is under the age of 60 and the *Wall Street Journal* announcement of the succession does not report the reason for the departure as involving death, poor health, or the acceptance of another position (elsewhere or within the firm) or the announcement reports that the CEO is retiring but does not announce the retirement at least six months prior to the succession. The circumstances surrounding the departures of the second group are further investigated by searching the business and trade press using Factiva and LexisNexis for relevant articles to reduce the likelihood that a turnover is incorrectly classified.[34] Because in this study we also collect information on the departing CEOs career path, we use one additional filter: When a CEO under the age of 60 cannot be found in a new position in any of the databases, we consider the departure as forced. With forced turnovers being identified in this manner, all remaining turnovers are considered voluntary. For both voluntary and forced turnover, we separately run the probit regression with CEO turnover as the dependent variable, with the benchmark being retention.

[34] These successions are reclassified as voluntary if the incumbent takes a comparable position elsewhere or departs for previously undisclosed personal or business reasons that are unrelated to the firm's activities. Comparable positions include any position among the top five executives in the firm.

Table 4 presents the results for different types of turnovers, corresponding to H2(a) and H3(a), respectively. We examine the frequency of turnovers in the first two columns.[35] The coefficient on *CUT_POST*5 is positive and significant for both voluntary and forced turnover. The economic magnitudes are as follows. First, the annual likelihood of forced turnovers increases by 1 percentage point—from 3.37% to 4.37%—in the five years immediately following major tariff cuts, representing almost a 10% increase in the overall turnover rate and a 30% increase in that for forced turnovers. Second, the likelihood of voluntary turnovers increases from 7.86% to 10.56%, representing a 24% increase in the overall turnover rate and a 34% increase in that for voluntary turnovers.

[Insert Table 4 near here.]

In Columns 3 and 4, we examine the turnover-performance sensitivity by including interaction terms between *CUT_POST*5 and two performance measures. The interaction term for *ROA* is negative and significant for both forced and voluntary turnovers, but the interaction term for *RET* is only significant for forced turnovers.

As argued by Kaplan and Minton (2012) and Jenter and Lewellen (2010), the classification algorithm described above could misclassify many forced turnovers as voluntary. However, the misclassification would very unlikely be the other way around. Thus, we can reliably interpret the effects of tariff cuts only on forced turnovers, corresponding to H2(a).

While we are less concerned that the forced turnover sample we end up with given available information is misclassified, the possible misclassification of turnovers that are actually forced as voluntary turnovers leaves a relatively small number (281) of turnovers classified as forced, and aslo potentially underestimated the effect of tariff cuts on forced turnovers. In the next subsections, we partition firms in each industry into subsamples to provide further evidence for both types of tariff cut-induced turnovers, as well as evidence that the impact of tariff cuts on disciplinary turnovers could be quite large if all forced turnovers were correctly classified.

[35] The sum of the number of observations in the two subsamples exceeds that in Table 3 because non-turnover firm years are included in both subsamples.

4.4 Previous Underperformers and Outperformers

To identify forced and voluntary turnovers in a different way, we separate the sample firms in the same industry (two-digit SIC code) into two groups based on whether the past three-year firm performance is above or below the industry mean. We argue that managers of the firms that outperformed the industry over the past three years are more likely to be good-quality managers and, therefore, their departures are more likely to be voluntary [H3(a)]. In contrast, managers of firms that underperformed are likely to be of poorer quality, and are unlikely to find good outside opportunities. Hence, their departures are likely to be forced [H2(b)].

Table 5, Panel A, presents the results for the frequency of turnovers. In the first two columns, firms are split into below (low) or above (high) industry mean groups based on their past three-year average return on assets. In the last two columns, firms are split into below (low) or above (high) industry mean groups based on their past three-year buy-and-hold stock return. The coefficient on *CUT_POST*5 is positive and significant in both underperforming and outperforming groups regardless of whether the prior performance is measured by accounting or market returns. The marginal effects suggest about a 3.5 to 4 percentage point increase in the turnover rate for each subsample of firms—in other words, roughly a 30% increase relative to the baseline turnover rate for non-post-tariff-cut years. If most of the turnovers in the underperforming group are disciplinary, then this assigns a much higher magnitude to the contribution of forced turnovers to the overall turnover rate after tariff cuts than our classification using standard algorithms would suggest.

[Insert Table 5 near here]

We then add an interaction term between *CUT_POST*5 and two performance measures to examine the effect of a tariff cut on turnover-performance sensitivity across the two performance groups (Panel B). The interactions are negative and significant for underperforming groups only. These results are in line with those reported in Table 4. In particular, they suggest that prior outperformers build up a reputation that enables them to hold on to their jobs relative to prior underperformers when competition intensifies and performance worsens after tariff cuts.

4.5 Corporate Governance and Forced CEO Turnover

If weak boards are doing a worse job of replacing inefficient management (Jenter and Lewellen, 2010) than strong boards, then an increase in the intensity of product market competition should make the weaker boards more proactive in replacing managers if they are concerned about firm survival (e.g., due to reputational concerns). In this subsection, we discuss our tests of H2(d).[36]

We use four proxies for governance. Our first measure is the G-Index in Gomper, Isshi, and Metrick (2003). Firms with high values of the G-Index are characterized by weak shareholder (or strong managerial) power, creating slack and inefficiency. Moreover, entrenched CEOs may be under less pressure to perform under normal times. Thus, our second measure is the entrenchment index (or E-Index), in Bebchuk, Cohen, and Ferrell (2009). A less independent board may be captured by CEOs and thus more likely to tolerate underperforming or less competent CEOs during normal times. We calculate the proportion of outsider directors on the board as a proxy for board independence. Finally, institutional investors are better monitors than individual shareholders (Denis, Denis, and Sarin, 1999; and Harford, Jenter, and Li, 2011); thus, boards of firms that have lower institutional ownership are likely to be under pressure to dismiss less capable CEOs only when the firm is under extreme stress. Therefore, the percentage of shares held by institutional investors is our fourth measure of governance.

To test our hypothesis, we partition our sample firms into two groups based on the value of the governance proxy as of the previous year. We define poor (good) governance firms as those with a percentage of independent directors (institutional ownership) below (above) the industry mean or G-Index or E-Index above (below) the industry mean. We then estimate probit regressions similar to those in Table 2 for each of the two groups for each governance variable.

Table 6, Panel A, presents the results on the frequency of CEO turnovers. The coefficients on *CUT_POST*5 are significantly positive for the weak governance subsamples, but not significant for the

[36] Amore and Zaldokas (2011) examine the impact of the US-Canada Free Trade Agreement of 1989 and find that the impact of more competition on firm performance was more negative on firms in US states that had enacted business combination laws that weakened corporate governance. This is consistent with our argument that firms with weaker boards are more at risk of survival when competition intensifies.

strong governance subsamples. The coefficients for the two subsamples are also significantly different for each proxy. The marginal effects are substantial. The turnover likelihood in the weak governance subsamples increases by 4 to 7 percentage points, which are very large magnitudes compared with the benchmark of 11.23% turnover frequency in non-post-tariff-cut years.[37] These results are consistent with our argument that boards that did not monitor effectively and allowed slack during normal times are the ones more affected by increased competition and, thus, forced to weed out inefficient managers. We then examine the sensitivity of CEO turnover to firm performance (Panel B). After the industry tariff rate is reduced, CEO turnover is more strongly and negatively associated with firm performance for firms with poor governance, while firms with strong governance show insignificant change in the sensitivity of CEO turnover to firm performance. The incremental effects are significantly only in the weak governance group but not in the strong governance group. Overall, the results in Table 7 are consistent with our hypothesis.

[Insert Table 6 near here]

4.6 Firm Productivity and Forced CEO Turnovers

One of the primary virtues of competition is that it does not tolerate inefficiency. Therefore, we would expect managers in less efficient firms to be punished more with increasing competition. In this subsection, we classify firms into efficient and inefficient groups based on various measures of productivity.

We use three distinct measures for productivity: total factor productivity, the ratio of firm sales to the number of employees, and the ratio of firm net income to the number of employees. Total factor productivity is measured as the residual from the regression of the logarithm of net sales on the logarithm of net property, plant, and equipment and the logarithm of the number of employees. We partition our sample firms into two groups based on whether their productivity in the previous year is above or below

[37] Thus, a large proportion of the turnovers in the poorly governed subsamples after tariff cuts are likely to have been classified as voluntary, but the results suggest that these might represent inefficient managers being replaced.

the industry average. We then run the same probit regression as in Table 2 for each of the two subgroups to test H2(c).

Table 7, Panel A, presents the results on the frequency of CEO turnovers. The coefficients on *CUT_POST*5 are significantly positive for firms with productivity lower than the industry mean, but insignificant for firms with productivity higher than the industry mean. The marginal effect of the tariff cut adds about 4 percentage points to the baseline turnover rate of 11.23% in non-cut periods. Because most or all of the effect of tariff cuts is coming from the low-productivity subsample, many of these turnovers are likely to have been classified as voluntary. However, to the extent that such turnovers occur in low-productivity firms, they also represent instances of competition weeding out less efficient managers, some of whom might be leaving voluntarily as they realize the challenges of survival in a tougher environment.

[Insert Table 7 near here]

By adding the interaction term between *CUT_POST*5 and two performance measures (Panel B), we find that the coefficients on the interaction between *CUT_POST*5 and firm performance are (with one exception) significantly negative and that the marginal effect is much higher for firms with low productivity. Overall, the results suggest that for firms that are far from the technology frontier, tariff reduction has a significant impact on the frequency of CEO turnover and the sensitivity of CEO turnover to performance, consistent with competition weeding out less efficient CEOs.

4.7 Firm Vulnerability and Voluntary Turnovers

More intense competition as a result of tariff cuts is likely to threaten the survival of firms that are younger and smaller. Thus, since the larger firms are likely to be relatively immune from the threat of competition, even the disciplinary weeding out of underperforming managers is most likely to be observed among the smaller firms. However, clearly, not all young and small firms are inefficient – in fact, there is substantial evidence that the younger and smaller firms are among the most innovative firms led by entrepreneurial managers. Consequently, if we see most of the turnover response to tariff cuts confined to the subsample of smaller and younger firms, it is extremely likely that a high percentage of

such turnovers are voluntary. This would be consistent with CEOs moving to other firms because their marginal productivities are now lower in their current firms, because they are concerned about survival, or because they prefer a quieter life. We expect three types of firms to struggle to survive when faced with more intense competition: firms that are ex ante more likely to be financially constrained, those with smaller market shares (corresponding to lower market power and smaller margins), or those subject to more information asymmetry (which could make the firm a target for predation). In this subsection, we examine the effect of a tariff cut on CEO turnover and turnover-performance sensitivity conditional on financial constraints, firms' market share, and firms' information environment [H3(c)–(e)].[38] To save space, we only report results for financial constraints and information environment – those based on market share are very consistent and available upon request.

Following Almeida, Campello, and Weisbach (2004), Campello and Graham (2013), and Almeida, Hsu, and Li (2013), we consider five measures of financial constraints: the WW index (Whited and Wu, 2006), firm size measured by market equity, firm age measured by the number of years since the firm joined the CRSP and Compustat merged database, payout ratio, and rating received for the firm's long-term debt. The last two measures are coded as dummy variables that equal one if firms pay dividends or receive an S&P rating for long-term debt. For each measure of financial constraint, all firms in the same two-digit SIC industry are divided into two subgroups based on whether the proxy in the year before is above or below the industry average or whether the dummy variable is one or zero. Constrained firms have a higher WW index, smaller size, younger age, a zero payout ratio policy, or no S&P ratings for long-term debt. We then estimate the baseline regression for the constrained and non-constrained groups separately.

The results for financial constraints are presented in Table 8. Panel A reports the results on the frequency of CEO turnovers. The first column for each proxy is for the subgroup that has firms with a

[38] These various measures of vulnerability, while motivated differently, are very likely to be correlated. For example, smaller firms are typically classified as financially constrained under most proxies of financial constraints. Such firms are also likely to suffer from more information asymmetry (in theory, an important determinant of financial constraint) and have smaller market share.

higher degree of financial constraint measured one year before the tariff cut. For example, the coefficient on *CUT_POST*5 is significantly positive for firms with higher WW index (Column 1), but insignificant for firms with lower WW index (Column 2). The Wald chi-square tests indicate that the difference of two coefficients across two subgroups is statistically different from zero at the 5% level. Columns 3 to 10 repeat the analysis by using the other four variables as a proxy for financial constraints. The results are very similar to those in the first two columns.

[Insert Table 8 near here]

The marginal effects for the financially constrained groups are extremely large—sometimes as high as 7 percentage points—while those for the less constrained groups are essentially zero. Clearly, all the action is confined to the former groups. The lack of any effect on the turnover likelihood for the latter groups suggests that any disciplinary turnovers are likely to be confined to the financially constrained group of firms. Firm survival is an issue, and boards are spurred into action, only when survival is threatened via more intense competition. Larger, more mature firms and those with easy access to debt markets are typically classified as financially unconstrained, and these firms are able to withstand more intense competition without a significant increase in board proactivity. However, the complete absence of any effect of tariff cuts on turnover rates for the unconstrained firms and the large increase in turnover rates among the financially constrained firms suggests that not all such turnovers are disciplinary, and many managers quit voluntarily when the going gets tough, consistent with quiet life preferences or implications of assignment models.

In Panel B, we add an interaction term between *CUT_POST*5 and firm performance measure. We then perform the subgroup analysis for each of the measures. We find that the coefficient on the interaction between *CUT_POST*5 and firm performance is significantly negative only for the firms facing more severe financial constraints. Overall, we provide evidence that for firms facing more severe financial constraints, more intense competition creates stronger incentives for departure, and, as a result, both the frequency of CEO turnover and the sensitivity of CEO turnover to performance change dramatically after a substantial industry tariff cut.

Following prior literature, we use several proxies for the firm's information environment. Our first proxy is return volatility, as measured by the standard deviation of daily returns during one year prior to the tariff cut. In addition, we use two measures of analysts' forecast errors in earnings (Gilson et al., 1998; and Krishnaswami and Subramanian, 1999). One is the mean of analysts' earnings forecast error, and the other is the dispersion of analysts' earnings forecast error. Our prior is that firms with higher return volatility, higher earnings forecast error, and larger dispersion of earnings forecast error will be more subject to predation, because external markets will find it difficult to understand whether lower profitability is due to poor firm or management quality, which is especially costly in bad times, or predatory activity by rivals. Thus, firms with more information asymmetry will face even tighter financial constraints following tariff cuts, especially if performance is poor.[39] Therefore, we expect that for such firms, more intense product market competition will lead to more CEO turnover and also more sensitivity of turnover to performance.[40]

The results for information asymmetry are presented in Table 9. Panel A reports on the frequency of CEO turnover. The coefficients on *CUT_POST*5 are significantly positive for firms with higher return volatility and for firms with greater dispersion and mean of earnings forecast error. The marginal effects are on the order of 3 to 6 percentage points. By adding the interaction term between *CUT_POST*5 and firm performance measures (Panel B), we find that the coefficients on the interaction between *CUT_POST*5 and firm's accounting and stock market performance are significantly negative for these same subgroups, but insignificant for the other subgroup of firms.

5. Firm Performance Changes and CEO Career Moves after Tariff Reduction

[39] See Bolton and Scharfstein (1990) for a model that endogenizes financial constraints in the presence of predation. A lower cost of predation (likely in times of more intense competition due to entry of foreign firms) in their model leads to tighter financial constraints.

[40] However, a higher threat of predation is not the only likely explanation for our results for firms with greater information asymmetry. Inefficient managers are more likely to survive in an environment in which monitoring is more difficult due to information asymmetry (Demsetz and Lehn, 1985; Gillan, Hartzell, and Starks, (2003; Raheja, 2005; Boone, Laura, Karpoff, and Raheja, 2007; and Linck, Netter, and Yang, 2008). When competition intensifies, boards may more proactively weed out such managers.

In this section, we examine two particular consequences of stiffer competition flowing industry tariff cuts, namely, performance changes associated with CEO turnovers, and post-turnover career outcomes of CEOs who leave or lose their jobs.

5.1 Post-Turnover Performance

To better understand the effect of CEO turnover decisions when the competition intensifies, we examine the change of firm performance when the CEO is replaced (H4). To do so, we use a difference-in-differences approach. We consider forced and voluntary turnovers separately. We define "treated" firms as those that experience a forced (alternatively, voluntary) CEO turnover in any of following five years in industries that experienced tariff cuts. We next construct a sample of "matched" firms that are similar to treated firms except for the occurrence of CEO turnover. For each treated firm, with replacement, we choose its "nearest neighbor" in the same year of turnover based on firm size, same industry (two-digit SIC code), and the implied probability of CEO turnover.[41] In other words, matched firms are those that share similar predicted odds of CEO departure as treated firms, but the board did not respond (for forced turnovers) or the CEO decided not to quit (for voluntary turnovers). H4 suggests that if forced turnovers represent an organizational response to more intense competition, then the treated firms would be expected to perform better than their matched counterparts. The matching procedure minimizes the possibility that cross-sectional differences across firms and industries affect performance differences.

Table 10 presents the results. We use three-year averages of profit margin, return on equity (*ROE)*, sales growth, and Tobin's q to measure firm performance, as well as total factor productivity (*TFP*) before and after the turnover. In Panel A, we reports results for the forced turnover sample. Consistent with H4, all four performance measures and *TFP* decrease less for the treated group than for the control group, although the difference is not significant for Tobin's q. In Panel B, we report the

[41] The implied probability of turnover is calculated based on the probit regression in Column 1, Table 2. We do not restrict ourselves to firms at the same four-digit SIC industry as the one experiencing turnover subsequent to the tariff cut because doing so forces us to choose from a much smaller set of firms and the propensity matching becomes much more noisy.

corresponding results for the voluntary turnover group. Although the treatment group again fares better for all five measures than the control group, we see a significant effect (at the 10% level) only for *ROE*. Although these samples are unmatched in terms of propensity to experience turnover, the performance or productivity deteriorations for the voluntary turnover sample are much weaker than for the forced turnover sample. Not surprisingly, this is also true of the respective matched samples.

[Insert Table 10 near here]

5.2 Post-Turnover Labor Market Outcomes

How does more intense competition affect the labor market outcomes of the CEOs who quit? If some of the turnovers are disciplinary in nature, we expect that a higher fraction of the turnovers immediately following the tariff cuts would result in no new appointments and that this effect should mainly result for the sample of forced turnovers. Also worth investigating is whether more competition allows the market to infer CEO ability better (as we argue in Section 2, more completion is likely to raise ability thresholds for CEO retention and could enable better inference) and allows the more talented CEOs to voluntarily leave the firm for better jobs. To examine these issues, we track the career outcomes of the departing CEOs by manually checking the relevant information in BoardEx and Capital IQ in a three-year window after the turnover. Out of 974 turnovers during our sample period, 133 or 13.6% of CEOs find an executive position (CEO or vice president) in another firm, 584 or 60% of CEOs become a nonexecutive director in a new firm, and the rest remain unemployed.

To gauge whether more intense competition leads to punitive departures, we create a dummy variable that takes a value of one if the departing CEO finds either an executive appointment or an appointment as director and zero if we find no evidence on any employment. We estimate a probit regression with this variable as the dependent variable. We partition the sample based on the nature of turnover (that is, forced or voluntary) and report the results in Columns 1 and 2 of Table 11. The variable of interest is *CUT*, which equals one if the departing CEO leaves the firm when the industry in which the firm operates experiences a substantial tariff reduction in any of the five years prior to the departure. The significant negative coefficient of *CUT* for the forced turnover sample suggests that departing CEOs are

less likely to obtain an executive or board position if the time of their departure coincides with the change of competition. However, *CUT* is insignificant for voluntary turnovers. This further validates our turnover classification.

[Insert Table 11 near here]

We next examine those CEO departures that result in executive positions. We collect information on executive pay, firm size, and industry of the new firm when departing CEOs get executives jobs. We first ask how more intense industry competition affects the probability of CEOs receiving a higher pay or working for a bigger firm. Results of the probit regression are presented in Column 3 of Table 11. The dependent variable, *Promotion*, is a dummy that equals one if a departing CEO receives a higher pay in the new firm or works for a larger firm (or both) and zero otherwise. The coefficient of *CUT* is -0.28, significant at the 10% level. Holding everything at the mean, the probability of finding a job that improves on the current one in at least one dimension drops from 22% to 15% if CEOs leave when the competition intensifies.

Finally, we examine whether departing CEOs tend to escape from the affected competitive environment by choosing to work for a new firm in a different industry, consistent with a quiet life story. To do so, we compare the four-digit SIC code of the new firm with that of the current firm. We then create a dummy variable, *Same Industry*, that equals one if the two SIC codes are the same. The probit regression, reported in Column 4 of Table 11, suggests that departing CEOs are less likely to work in the same industry if they leave after the tariff reduction. This result is consistent with the quiet life hypothesis but inconsistent with the notion that greater competition helps the more capable CEOs in the industry showcase their ability, because, in this case, the presumption is that their abilities would be more valued in the same industry.[42]

[42] We also check whether, as implied by competitive assignment models, CEOs end up in larger firms as the market values of their current firms are likely to shrink after the tariff cuts, suggesting that they should move to firms in which their marginal productivities would be higher. For the purposes of this test, we compare the value of the firm the CEO leaves one year after the cut (so that we capture the effect of the cut on market value) and that of the firm he or she joins. We find no significant difference in the sizes of the two groups of firms. This suggests that

6. Robustness Checks

In this section, we address some potential concerns with our identification strategy and estimation methods. We first present evidence that ameliorates the concern that tariff cuts could occur in industries with particular types of growth or performance prospects where CEO turnovers would have occurred anyway. We then show that our results hold for subsamples for which specific endogeneity concerns are less likely to arise, as well as when alternative estimation methods are used.

6.1 Potential Endogeneity of Tariff Cuts

A potential challenge for our identification strategy is that trade policy results from the interactions between politicians and the corporate sector. As a result, politicians could modify import tariffs based on certain industry characteristics that are related to firms' investment prospects. For instance, politicians could lower tariffs in declining industries that exhibit low expected growth rates or poor performance outcomes. As such, trade protection may be granted to or removed from industries featuring specific growth, investment, or performance patterns. To assess the validity of this concern, we follow Frésard (2010) and estimate several regressions linking tariff reductions to industry (mean and median) characteristics related to performance and growth opportunities. To be consistent with our main results, we use all the firms from Compustat with available data that can be matched to the tariff data. We expect industry characteristics to have no statistical power in predicting the dynamics of import tariffs. Results are presented in Table B1. Columns 1 and 2 report the results of ordinary least squares regressions of the annual change in industry-level tariffs on several one-year lagged industry-level variables, as well as year and industry fixed effects. Reassuringly, we find no evidence that average and median industry characteristics can predict the dynamics of trade policy. In Columns 3 and 4, we further examine whether industry-level variables can predict the large tariff reduction. To do so, we regress an indicator variable that identifies large tariff reductions on lagged industry-level predictors. Again, we note

assignment considerations alone do not explain the nature of CEO moves. For example, CEOs may be willing to move to other firms because they prefer a quiet life.

no systematic ability to predict the occurrence of large tariff reductions. These findings attenuate the concern that tariff reductions are related to industry characteristics that could explain our findings.

In general, tariff agreements can be bilateral or multilateral, with the latter involving more than two countries negotiating over a large variety of products often in various industries. The multi-country-industry dimension of such agreements limits the vulnerability of government officials to political pressures of interested parties. Furthermore, the participation of international institutions imposes rules and formal obligations that restrict the influence of certain industries or corporations. For that reason, these reductions can be viewed as relatively more exogenous than reductions resulting from bilateral agreements. We make two attempts to separate out the multilateral agreements. First, the General Agreement on Tariffs and Trade (GATT) initiated a multilateral trade negotiation, with 125 countries signing the agreement in 1993. Shortly thereafter, the World Trade Organization (WTO) was established as the successor to the GATT. Accordingly, we separate the sample into pre- and post-WTO periods, with the latter more likely to involve the multilateral tariff agreements as a result of GATT and WTO. The subperiod analysis is presented in the first two columns of Table 12. The effect of tariff reduction on turnover and turnover-performance sensitivity is much more significant in the post-WTO period than the pre-WTO period. As our sample period starts in 1992, we have a limited number of years for the pre-WTO period. To get a more balanced subperiod analysis while maintaining the exogenous nature of multilateral agreement, we calculate the number of industries that are affected by the substantial tariff reduction in each year. We then consider the years that have the number of affected industries above the sample mean as the period in which the tariff agreement is less subject to political pressure or special interest (we call it the high contagion group). The results are presented in the last two columns of Table 12. The results in both panels suggest that tariff reduction has a much stronger effect when more industries are affected.

[Insert Table 13]

6.2 Tariff Cuts and Firm Diversification

The extent to which tariff reduction affects firm profit might depend on firms' exposure to the affected product markets. On the one hand, firms with all their products in a single industry may be affected most if such industry faces a dramatic change in competition from foreign firms. On the other hand, well-diversified firms or firms with multiple business lines might be able to deal better with foreign competition if some of their products are not affected. Hence, we collect data from Compustat Business Segment files and separate the single segment firms from multiple segment ones. Similarly, we separate firms based on their degree of concentration in segment sales. We consider firms with their Herfindahl-Hirschman Index of segment sales in the year before the tariff change above the mean of all firms in the same industry as less diversified group. We present the subgroup analysis in Table 13. We find that tariff reduction leads to more CEO turnovers and higher turnover-performance sensitivity in single segment firms or less diversified group. Moreover, the difference between the more and less diversified groups is statistically significant. In the last column of Table 13, we repeat our main analysis for the exporting firms. While we expect the tariff reduction to have a much weaker effect on exporting firms as it is likely that exporting firms can also benefit from the tariff change through their exporting business, the result suggests that exporting firms also experience higher CEO turnover, but not higher turnover-performance sensitivity when the competition environment changes.

[Insert Table 13 near here]

6.3 Linear Probability Model

Since the probit is a non-linear model, incorporation of firm fixed effects produces biased estimates due to the incidental parameter problem, and estimation of a large number of fixed effects in this setting also is impractical. To control unobserved firm-level heterogeneity, we estimate a linear probability model with firm fixed effects. The results, reported in Table B2, produces very similar results to those in Table 2. To further examine the robustness of our results, we perform the subsample analysis using linear probably model. For the sake of brevity, we only present the results based on productivity (*TFP*), corporate governance (*G-index*) and financial constraint (*WW Index*) in Table B3. Consistent with non-linear probit model, the linear model also indicates that tariff cut has a significant impact on turnover

and turnover-performance sensitivity only for firms with low productivity, poor governance and weak financial strength.

7. Conclusions

Apart from increasing social welfare via an increase in the consumers' surplus that more than offsets the reduction is producers' surplus, one of the benefits of greater product market competition is supposed to be that it keeps companies on their toes and that it reduces slack and improves performance efficiency. Surprisingly limited evidence exists, however, on the latter. In this paper, we examine how managerial retention decisions respond to greater competition intensity: whether competition weeds out inefficient management and whether any other consequences of competition arise in terms of how firms and managers are reassigned across firms in the economy. To do so, we focus on industry-level major tariff cuts for US producers, which represent exogenous shocks to the competitive environment in these industries. Such an approach has major advantages over industry-level concentration measures such as the Herfindahl-Hirschman Index, because

We do find strong evidence consistent with increased competition weeding out less efficient management. Managerial turnover, and the performance sensitivity of turnover, increases for firms that have lower productivity as measured by *TFP* and other measures but not for firms that have higher productivity. We find direct evidence of increased board proactivity in that the likelihood of turnovers classified as "forced," and the performance sensitivity of such turnovers, also increases. When we examine how corporate governance quality affects turnover and turnover-performance sensitivity, we find strong evidence that the boards of firms with weaker governance become more proactive and both managerial turnover and the sensitivity of turnover to performance increases for such firms. This is consistent with the notion that, under normal times, weak boards tolerate slack and inefficiency but become more proactive when competition threatens firm survival and the reputation of board members. Finally, for forced turnovers, performance improves on a number of dimensions after the turnover, relative to a matched sample of firms with a similar propensity to experience turnover, but when no

turnover occurs. This is consistent with boards becoming more proactive and implementing changes (CEO firing being part of that process) in response to more intense competition that improves firm performance.

We find that the likelihood of voluntary turnovers and the performance sensitivity of such turnovers also increase following tariff cuts. We find especially strong evidence of such departures for financially constrained firms, firms with greater information asymmetry that are likely more vulnerable to predation by rivals, and firms with smaller market share. Such departures could be driven by managers' preference for jobs at industries with competition that is less fierce, so that they do not have to work as hard, and by the efficient re-assignment of managers to firms in which their marginal productivities are higher. We do not, however, find any evidence of performance deterioration after such departures. In fact, we find weak evidence of some performance improvement, which could reflect the fact that underperforming managers quit voluntarily (or some forced turnovers are misclassified as voluntary turnovers). Thus, overall, our evidence is consistent with the notion that competition weeds out nonperforming managers and pushes firms toward retention policies that are shareholder value maximizing.

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Table 1: Summary Statistics

The sample consists of all firms in manufacturing industries (2000–3999 standard industrial classification range) that also have data available on the ExecuComp database between 1992 and 2006. *Tariff* is the duties collected by the US Customs Service divided by the free-on-board value of imports. Forced and voluntary turnovers are defined as in Parrino, Sias, and Starks (2003), with the additional filter that departures of chief executive officers (CEOs) before age 60 for whom we cannot find any record of another position, including directorial appointments, are classified as forced. All other variables in Panel A are defined in Table A1. Panel B summarizes CEO turnover for our sample firms between 1992 and 2005. Total turnover is the sum of forced and voluntary turnover. Under each turnover type, we report the number and the unconditional probability (in percent).

Panel A: Descriptive statistics

Variable	Number	Mean	Standard deviation	25th percentile	50th percentile	75th percentile
Tariff	6,410	1.22	2.11	0.001	0.434	1.586
ROA	6,410	0.012	0.325	0.009	0.052	0.092
RET	6,262	0.188	0.603	-0.165	0.099	0.379
Salechg	6,460	0.171	0.976	-0.003	0.085	0.213
Assets	6,385	6.944	1.631	5.838	6.81	7.914
Q	6,363	2.327	2.052	1.298	1.737	2.579
Age	6,050	56.178	7.732	51	56	61
Volatility	6,263	0.469	0.261	0.289	0.396	0.593

Panel B: CEO turnover by year

Year	Total turnover		Forced turnover		Voluntary turnover	
	Number	Unconditional probability	Number	Unconditional probability	Number	Unconditional probability
1993	18	5.76	5	1.45	13	4.31
1994	52	11.56	19	4.36	33	7.20
1995	59	12.46	18	3.96	41	8.50
1996	70	13.61	20	4.31	50	9.30
1997	89	16.78	32	6.88	57	9.90
1998	95	17.52	33	6.90	62	10.62
1999	123	20.05	38	7.77	85	12.28
2000	94	17.90	27	5.51	67	12.39
2001	67	11.79	22	4.67	45	7.12
2002	69	13.06	18	3.88	51	9.18
2003	64	12.55	20	4.22	44	8.33
2004	86	15.18	18	3.90	68	11.28
2005	88	15.42	11	2.46	77	12.96
1993–2005	974	14.13	281	4.64	693	9.49

Table 2: Tariff Cuts and CEO Turnover

This table reports the results of a probit regression in which the dependent variable equals one if the CEO departs in year *t* under a normal hiring and firing event and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. *Before* is a dummy variable equal to one if one or two years earlier a specific industry experiences a substantial tariff reduction. All other variables are measured in the year prior to the turnover and defined in Table A1. Year and industry fixed effects are included in all columns. Robust standard errors, clustered by two-digit standard industrial classification codes, are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Variable	(1)	(2)	(3)	(4)	(5)
CUT_POST5		0.199***	0.231***	0.115	0.101
		(0.062)	(0.073)	(0.071)	(0.084)
ROA	-0.142**	-0.206*	-0.180	-0.162	-0.075
	(0.066)	(0.124)	(0.131)	(0.116)	(0.151)
CUT_POST5 * ROA				-0.469	-0.752**
				(0.314)	(0.341)
RET	-0.150***	-0.144**	-0.206***	-0.125**	-0.193**
	(0.057)	(0.061)	(0.076)	(0.064)	(0.081)
CUT_POST5 * RET				-0.005	0.173
				(0.130)	(0.147)
Salechg	-0.332***	-0.314***	-0.222*	-0.316***	-0.252*
	(0.106)	(0.113)	(0.123)	(0.103)	(0.135)
Assets	0.030	0.034	0.074***	0.029	0.074***
	(0.018)	(0.021)	(0.024)	(0.019)	(0.024)
Q	-0.032*	-0.030	-0.013	-0.041**	-0.021
	(0.019)	(0.021)	(0.024)	(0.021)	(0.025)
Age_dummy	0.904***	0.861***	1.017***	0.861***	0.999***
	(0.051)	(0.056)	(0.065)	(0.052)	(0.066)
Volatility	0.348***	0.472***	0.538***	0.419***	0.518***
	(0.110)	(0.150)	(0.178)	(0.134)	(0.194)
Before			0.179		0.078
			(0.132)		(0.151)
Before * ROA					-0.694
					(1.506)
Before * RET					-0.178
					(0.386)
Marginal effects for CUT_POST5		0.040***	0.039***		
Marginal effects for CUT_POST5 * ROA				-0.096	-0.121**
Marginal effects for CUT_POST5 * RET				-0.011	0.041
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.13	0.13	0.16	0.13	0.14
Observations	4,288	4,288	4,288	4,288	4,288

Table 3: Tariff Cuts, Product Substitutability, and CEO Turnover

This table reports the results of a probit regression in which the dependent variable equals one if the CEO departs in year *t* and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. *Similarity* is the firm-level total similarity index based on Hoberg and Phillips (2011) and on the comparison of product descriptions in firms' 10-K annual filings with the cosine similarity method. *R&D* is research and development expenses scaled by total assets. For each proxy and for each year, all firms in the same industry [two-digit standard industrial classification (SIC) codes] are divided into two subgroups based on whether the proxy in the year before the turnover is above (high) or below (low) the industry average. All other control variables are the same as those in Table 2, which are defined in Table A1. Year and industry fixed effects are included in all columns. Robust standard errors, clustered by two-digit SIC codes, are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Turnover

	Similarity		R&D	
	Low	High	High	Low
Variable	(1)	(2)	(3)	(4)
CUT_POST5	0.047	0.379***	0.111	0.383***
	(0.096)	(0.118)	(0.128)	(0.129)
ROA	-0.281	-0.285	-0.209	-0.232
	(0.180)	(0.144)	(0.169)	(0.196)
RET	-0.161**	-0.317***	-0.207	-0.187*
	(0.082)	(0.111)	(0.202)	(0.107)
Before	0.191	0.146	0.019	0.471
	(0.162)	(0.227)	(0.214)	(0.348)
Wald $\chi 2$ test for CUT_POST5 (*p*-value)		0.01**		0.06*
Marginal effects for CUT_POST5	0.008	0.036***	0.020	0.054***
Control variables	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Pseudo-R^2	0.16	0.20	0.17	0.22
Observations	2,187	1,885	1,817	1,753

Panel B: Turnover-performance sensitivity

	Similarity		R&D	
	Low	High	High	Low
Variable	(1)	(2)	(3)	(4)
CUT_POST5	0.070	0.191	0.105	0.374**
	(0.100)	(0.156)	(0.133)	(0.151)
ROA	0.208	-0.487*	-0.178	-0.044
	(0.184)	(0.249)	(0.218)	(0.182)
CUT_POST5* ROA	-0.492	-0.751*	-0.529	-1.604***
	(0.451)	(0.392)	(0.367)	(0.327)
RET	-0.200**	-0.302**	-0.179	-0.254**
	(0.097)	(0.120)	(0.111)	(0.126)
CUT_POST5* RET	0.211	-0.264**	0.096	-0.351**
	(0.166)	(0.123)	(0.219)	(0.139)
Before	0.174	-0.207	-0.032	-0.210
	(0.198)	(0.271)	(0.272)	(0.281)
Before* ROA	1.151	-3.629	8.165	-4.688*
	(2.084)	(2.691)	(5.007)	(2.397)
Before* RET	-0.780	0.241	-0.588	0.100
	(0.676)	(0.305)	(0.995)	(0.715)
Marginal effects for CUT_POST5* ROA	-0.095	-0.132*	-0.103	-0.310**
Marginal effects for CUT_POST5* ROA	0.036	-0.039***	0.015	-0.059**
Control variables	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Pseudo-R^2	0.16	0.20	0.17	0.23
Observations	2,187	1,885	1,817	1,753

Table 4: Tariff Cuts and Voluntary or Forced Turnovers

This table reports the results of a probit regression in which the dependent variable equals one if the chief executive officer (CEO) departs voluntarily (Columns 1 and 3) or is forced to depart (Columns 2 and 4) in year *t* and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. The definition of voluntary and forced turnover is based on Parrino, Sias, and Starks (2003), with the additional filter that departures of CEOs before age 60 for whom we cannot find any record of another position, including directorial appointments, are classified as forced. Columns 1 and 3 show the results when the dependent variable is one (voluntary turnover) and zero (no turnover). Columns 2 and 4 show the results when the dependent variable is one (forced turnover) and zero (no turnover). . All other control variables are the same as those in Table 2, which are defined in Table A1. Year and industry fixed effects are included in all columns. Robust standard errors clustered by two-digit standard industrial classification codes are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Voluntary	Forced	Voluntary	Forced
Variable	(1)	(2)	(3)	(4)
CUT_POST5	0.243***	0.218**	0.193**	0.092
	(0.076)	(0.103)	(0.089)	(0.139)
ROA	-0.148	-0.183*	-0.065	-0.224
	(0.129)	(0.101)	(0.171)	(0.162)
CUT_POST5 * ROA			-0.754**	-0.641**
			(0.392)	(0.313)
RET	-0.099	-0.486***	-0.069	-0.391**
	(0.079)	(0.161)	(0.086)	(0.170)
CUT_POST5 * RET			0.074	-0.261**
			(0.150)	(0.094)
Before	0.071	0.121	-0.025	-0.321
	(0.148)	(0.213)	(0.168)	(0.251)
Before * ROA			2.148	-2.158
			(2.016)	(2.179)
Before * RET			-0.046	-0.254
			(0.318)	(0.609)
Marginal effects for CUT_POST5	0.027***	0.010**		
Marginal effects for CUT_POST5 * ROA			-0.112**	-0.052**
Marginal effects for CUT_POST5 * RET			0.009	-0.047**
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Pseudo-R^2	0.17	0.14	0.15	0.15
Observations	3.255	2,816	3.255	2,816

Table 5: Tariff Cuts, Past Performance, and CEO Turnover

This table reports the results of a probit regression in which the dependent variable equals one if the CEO departs in year *t* and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. Column 1 (2) includes firms with past three-year average return on assets (*ROA*) above (high) or below (low) the mean of all firms in the industry with the same two-digit standard industrial classification (SIC) codes. Column 3 (4) includes firms with past three-year buy-and-hold stock return (*RET*) above (high) or below (low) the mean of all firms in the industry with the same two-digit SIC codes. . All other control variables are the same as those in Table 2, which are defined in Table A1. Year and industry fixed effects are included in all columns. Robust standard errors clustered by two-digit SIC codes are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Turnover

	ROA		RET	
	Low	High	Low	High
Variable	(1)	(2)	(3)	(4)
CUT_POST5	0.183*	0.283***	0.182**	0.251**
	(0.098)	(0.104)	(0.082)	(0.110)
ROA	-0.002	-0.181	-0.061	0.045
	(0.140)	(0.840)	(0.150)	(0.380)
RET	-0.322***	-0.187*	-1.227***	0.061
	(0.102)	(0.109)	(0.294)	(0.107)
Before	0.171	0.120	0.385*	0.121
	(0.185)	(0.194)	(0.215)	(0.202)
Wald $\chi 2$ test for CUT_POST5 (*p*-value)		0.41		0.32
Marginal effects for CUT_POST5	0.034*	0.042***	0.035**	0.037**
Control variables	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Pseudo-R^2	0.18	0.16	0.22	0.15
Observations	1,529	2,044	1,291	2,194

Panel B: Turnover-performance sensitivity

	ROA		RET	
	Low	High	Low	High
Variable	(1)	(2)	(3)	(4)
CUT_POST5	0.365	0.287	0.322*	0.264
	(0.235)	(0.192)	(0.192)	(0.163)
ROA	0.252	-0.054	-0.127	0.424
	(0.974)	(0.193)	(0.153)	(0.485)
CUT_POST5 * ROA	-0.993*	-0.444	-1.200*	-0.545
	(0.578)	(0.407)	(0.691)	(0.359)
RET	-0.255**	-0.125	-0.376*	-0.025
	(0.122)	(0.126)	(0.218)	(0.129)
CUT_POST5 * RET	-0.398**	-0.110	-0.771**	0.175
	(0.195)	(0.252)	(0.388)	(0.185)
Before	-0.632*	0.041	-0.456	0.011
	(0.347)	(0.247)	(0.401)	(0.242)
Before* ROA	-0.108	2.265	-0.251	0.612
	(2.026)	(3.780)	(1.955)	(3.234)
Before* RET	-0.566	-0.052	-2.012*	-0.017
	(1.020)	(0.293)	(1.182)	(0.284)
Marginal effects for CUT_POST5 * ROA	-0.101*	-0.075	-0.087*	-0.152
Marginal effects for CUT_POST5 * RET	-0.029**	-0.069	-0.089*	0.051
Control variables	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Pseudo-R^2	0.24	0.16	0.17	0.17
Observations	1,529	2,044	1,291	2,194

Table 6: Tariff Cuts, Corporate Governance, and CEO Turnover

This table reports the results of a probit regression in which the dependent variable equals one if the CEO departs in year *t* and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. *G-Index* is the governance index based on Gompers, Ishii, and Metrick (2003). *E-Index* is the entrenchment index based on Bebchuk, Cohen, and Ferrell (2009). *Independence* is the proportion of independent directors on the board. *Institutional* measures the sum of ownership of all institutional investors who hold the firm stock. For each proxy and for each year, all firms in the same industry [two-digit standard industrial classification (SIC) codes] are divided into two subgroups based on whether the proxy in the year before is above (high) or below (low) the industry average. All other control variables are the same as those in Table 2, which are defined in Table A1. Year and industry fixed effects are included in all columns. Robust standard errors, clustered by two-digit SIC codes, are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Turnover

	G-Index		E-Index		Independence		Institutional	
	High	Low	High	Low	Low	High	Low	High
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CUT_POST5	0.305***	0.112	0.311***	-0.236	0.293***	0.128	0.477***	0.047
	(0.089)	(0.121)	(0.079)	(0.170)	(0.091)	(0.114)	(0.106)	(0.102)
ROA	-0.350**	0.220	-0.271*	0.260	0.163	-0.333**	-0.149	-0.329
	(0.153)	(0.176)	(0.144)	(0.279)	(0.202)	(0.167)	(0.150)	(0.278)
RET	-0.149*	-0.359***	-0.223***	-0.286	-0.195	-0.235***	-0.072	-0.384***
	(0.089)	(0.126)	(0.080)	(0.197)	(0.122)	(0.090)	(0.094)	(0.113)
Before	0.184	0.195	0.225	0.053	0.089	0.240	-0.126	0.126
	(0.156)	(0.242)	(0.148)	(0.292)	(0.220)	(0.163)	(0.181)	(0.189)
Wald $\chi 2$ test for CUT_POST5 (*p*-value)		0.05**		0.09*		0.09*		0.00***
Marginal effects for CUT_POST5	0.047***	0.015	0.050***	-0.029	0.039***	0.024	0.072***	0.007
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.18	0.19	0.20	0.17	0.18	0.18	0.19	0.18
Observations	2,765	1,520	2,388	1,897	1,411	2,873	2,007	2,280

Panel B: Turnover-performance sensitivity

	G-Index		E-Index		Independence		Institutional	
	High	Low	High	Low	High	Low	High	Low
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CUT_POST5	0.188	0.102	0.180**	-0.094	0.178	0.106	0.259**	0.013
	(0.155)	(0.099)	(0.091)	(0.209)	(0.131)	(0.109)	(0.114)	(0.128)
ROA	-0.443*	-0.320**	0.569	-0.276*	0.549	-0.401**	-0.235	0.307
	(0.228)	(0.162)	(0.493)	(0.158)	(0.416)	(0.186)	(0.171)	(0.397)
CUT_POST5 * ROA	-1.193*	-0.531	-1.099*	-0.440	-1.145**	-0.185	-0.686*	-0.877
	(0.630)	(0.361)	(0.575)	(0.330)	(0.455)	(0.329)	(0.392)	(0.609)
RET	-0.554***	-0.089	-0.519**	-0.200**	-0.385***	-0.159*	-0.223**	-0.246**
	(0.170)	(0.091)	(0.217)	(0.085)	(0.142)	(0.095)	(0.105)	(0.117)
CUT_POST5 * RET	-0.528**	0.101	-0.800***	0.163	-0.536**	0.021	-0.602***	-0.284
	(0.252)	(0.176)	(0.306)	(0.155)	(0.219)	(0.189)	(0.168)	(0.231)
Before	0.042	0.017	-0.433	0.091	-0.299	0.097	-0.128	0.267
	(0.251)	(0.194)	(0.461)	(0.169)	(0.291)	(0.198)	(0.205)	(0.230)
Before* ROA	-1.476	-0.752	-1.950	-0.159	-3.651	0.314	1.500	-2.550
	(2.764)	(1.762)	(2.617)	(1.925)	(4.802)	(1.873)	(2.856)	(2.393)
Before* RET	0.654	-0.670	-2.006	-0.023	0.787*	-0.824	-0.363	0.085
	(0.422)	(0.672)	(1.546)	(0.432)	(0.473)	(0.681)	(0.537)	(0.462)
Marginal effects for CUT_POST5 * ROA	-0.187*	-0.106	-0.154**	-0.095	-0.225**	-0.039	-0.145*	-0.146
Marginal effects for CUT_POST5 * RET	-0.073**	0.018	-0.113**	0.026	-0.101*	0.008	-0.108**	-0.048
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.22	0.17	0.22	0.17	0.19	0.17	0.19	0.18
Observations	2,765	1,520	2,388	1,897	1,411	2,873	2,007	2,280

Table 7: Tariff Cuts, Firm Productivity, and CEO Turnover

This table reports the results of a probit regression in which the dependent variable equals one if the CEO departs in year *t* and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. *TFP* is total factor productivity, measured as the residual from the regression of the logarithm of net sales on the logarithm of net property, plant, and equipment and the logarithm of the number of employees. *Sales_Emp* is the ratio of firm's sales divided by the number of employees. *NI_Emp* is the ratio of firm's net income divided by the number of employees. For each proxy and for each year, all firms in the same industry [two-digit standard industrial classification (SIC) codes] are divided into two subgroups based on whether the proxy in the previous year is above (high) or below (low) the industry average. All other control variables are the same as those in Table 2, which are defined in Table A1. Year and industry fixed effects are included in all columns. Robust standard errors, clustered by two-digit SIC codes, are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Turnover

	TFP		Sale_Emp		NI_Emp	
	Low	High	Low	High	Low	High
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CUT_POST5	0.201*	0.105	0.250**	0.029	0.180*	0.033
	(0.116)	(0.130)	(0.116)	(0.112)	(0.109)	(0.120)
ROA	-0.048	-0.111	-0.254*	-0.414	-0.170	-0.566
	(0.268)	(0.146)	(0.142)	(0.401)	(0.147)	(0.745)
RET	-0.198*	-0.225**	-0.083	-0.324***	-0.207**	-0.192**
	-0.102	(0.089)	(0.101)	(0.096)	(0.093)	(0.097)
Before	0.209	-0.211	0.215	-0.141	0.092	0.240
	(0.238)	(0.215)	(0.172)	(0.197)	(0.177)	(0.187)
Wald χ2 test for CUT_POST5 (*p*-value)		0.09*		0.00***		0.01**
Marginal effects for CUT_POST5	0.036*	0.029	0.042**	0.005	0.036*	0.005
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.16	0.20	0.19	0.16	0.18	0.15
Observations	1,965	2,316	1,899	2,350	2,068	2,180

Panel B: Turnover-performance sensitivity

	TFP		Sale_Emp		NI_Emp	
	Low	High	Low	Low	High	Low
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CUT_POST5	0.183	0.148	0.201*	-0.003	0.160	0.009
	(0.134)	(0.119)	(0.117)	(0.134)	(0.123)	(0.150)
ROA	0.427	0.001	0.149	-0.187	0.186	-0.597
	(0.394)	(0.185)	(0.238)	(0.169)	(0.202)	(0.656)
CUT_POST5 * ROA	-1.950**	-0.721**	-1.490*	-0.616	-0.582*	-0.272
	(0.842)	(0.342)	(0.850)	(0.378)	(0.331)	(1.119)
RET	-0.238*	-0.246**	-0.145	-0.299**	-0.343***	-0.203**
	(0.122)	(0.107)	(0.097)	(0.128)	(0.112)	(0.100)
CUT_POST5 * RET	-0.190*	0.088	-0.290*	-0.066	-0.313	-0.233
	(0.107)	(0.186)	(0.167)	(0.220)	(0.204)	(0.186)
Before	-0.480	0.225	0.244	-0.118	0.046	0.072
	(0.426)	(0.242)	(0.209)	(0.236)	(0.266)	(0.243)
Before* ROA	-5.491	1.365	-0.785	3.035	3.215	-2.519
	(6.815)	(2.439)	(1.641)	(2.811)	(3.809)	(3.313)
Before* RET	-0.159	0.178	-0.559	0.046	-1.286	0.099
	(0.737)	(0.310)	(0.607)	(0.467)	(0.972)	(0.429)
Marginal effects for CUT_POST5 * ROA	-0.396*	-0.129*	-0.123*	-0.246	-0.114*	-0.023
Marginal effects for CUT_POST5 * RET	-0.083*	0.047	-0.069*	-0.011	-0.054	-0.036
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.17	0.20	0.17	0.20	0.20	0.16
Observations	1,965	2,316	1,899	2,350	2,068	2,180

Table 8: Tariff Cuts, Financial Constraints, and CEO Turnover

This table reports the results of a probit regression in which the dependent variable equals one if the CEO departs in year *t* and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. *WW Index* is based on Whited and Wu (2006). *Size* is firm size measured by market value of firm equity. *Age* is firm age measured by the number of years since the firm joined the Center for Research in Security Prices (CRSP)–Compustat merged database. *Dividends* is a dummy variable that equals one if the sum of cash dividends for common and preferred stocks is positive and zero otherwise. *Rating* is a dummy variable that equals one if a firm has a Standard & Poor's rating for long-term debt and zero otherwise. For each proxy and for each year, all firms in the same industry [two-digit standard industrial classification (SIC) codes] are divided into two subgroups based on whether the proxy in the year before is above (high) or below (low) the industry average or whether the dummy variable is one or zero. All other control variables are the same as those in Table 2, which are defined in Table A1. Year and industry fixed effects are included in all columns. Robust standard errors, clustered by two-digit SIC codes, are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Turnover

	WW Index		Size		Age		Dividends		Rating	
	High	Low	Low	High	Low	High	=0	=1	=0	=1
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CUT_POST5	0.243*	-0.048	0.250**	-0.061	0.389***	-0.073	0.307**	0.060	0.330***	-0.181
	(0.127)	(0.124)	(0.103)	(0.129)	(0.125)	(0.103)	(0.139)	(0.096)	(0.108)	(0.128)
ROA	-0.243	-0.193	-0.177	-0.356*	-0.262*	-0.051	-0.191	-0.071	-0.151	-1.357***
	(0.196)	(0.164)	(0.148)	(0.194)	(0.145)	(0.280)	(0.134)	(0.258)	(0.127)	(0.373)
RET	-0.248**	-0.139	-0.243***	-0.170	-0.215**	-0.237**	-0.183**	-0.237**	-0.219***	-0.311**
	(0.096)	(0.094)	(0.084)	(0.107)	(0.091)	(0.102)	(0.084)	(0.113)	(0.078)	(0.137)
Before	0.003	0.255	0.029	0.311	-0.013	0.167	0.354	0.086	0.250	0.030
	(0.212)	(0.197)	(0.156)	(0.225)	(0.208)	(0.171)	(0.276)	(0.154)	(0.184)	(0.198)
Wald χ2 test for CUT_POST5 (*p*-value)		0.03**		0.02**		0.04**		0.06*		0.01**
Marginal Effects for CUT_POST5	0.040*	-0.009	0.043**	-0.011	0.072***	-0.013	0.058**	0.011	0.061***	-0.031
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.20	0.17	0.17	0.18	0.17	0.18	0.15	0.19	0.16	0.22
Observations	1,876	1,888	2,013	2,273	2,115	2,173	1,879	2,369	2,924	1,322

Panel B: Turnover-performance sensitivity

	WW Index		Size		Age		Dividends		Rating	
	High	Low	Low	High	Low	High	Low	Low	High	Low
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CUT_POST5	0.258*	0.018	0.250**	-0.043	0.356***	-0.007	0.224	0.154	0.301***	-0.130
	(0.134)	(0.131)	(0.107)	(0.130)	(0.129)	(0.108)	(0.148)	(0.103)	(0.111)	(0.142)
ROA	-0.118	-0.073	-0.035	-0.322	-0.173	-0.274	-0.136	-0.404	-0.062	-0.396
	(0.198)	(0.175)	(0.177)	(0.220)	(0.156)	(0.454)	(0.152)	(0.381)	(0.153)	(1.124)
CUT_POST5 * ROA	-1.307***	-0.436	-0.827**	-0.218	-0.498*	-0.268	-0.927**	-0.205	-0.680*	-2.676
	(0.283)	(0.349)	(0.368)	(0.427)	(0.278)	(0.621)	(0.449)	(0.492)	(0.356)	(1.912)
RET	-0.264**	-0.182*	-0.250***	-0.198	-0.217**	-0.261**	-0.173*	-0.304**	-0.222**	-0.474***
	(0.110)	(0.102)	(0.097)	(0.128)	(0.110)	(0.110)	(0.098)	(0.124)	(0.092)	(0.164)
CUT_POST5 * RET	-0.184***	0.201	-0.232	0.246	-0.189	-0.174	-0.411**	0.127	-0.289*	0.212
	(0.030)	(0.197)	(0.169)	(0.227)	(0.172)	(0.231)	(0.181)	(0.170)	(0.152)	(0.295)
Before	0.244	-0.091	0.083	-0.094	0.020	-0.108	-0.390	-0.008	0.185	-0.178
	(0.247)	(0.216)	(0.194)	(0.275)	(0.266)	(0.196)	(0.653)	(0.168)	(0.226)	(0.227)
Before* ROA	-2.198	2.359	-1.162	-1.400	-1.858	1.678	-2.259	1.859	-1.446	4.477
	(1.795)	(2.249)	(1.707)	(2.802)	(2.045)	(3.187)	(3.178)	(2.506)	(1.469)	(3.483)
Before* RET	-0.168	-0.027	-0.456	0.401	-0.826	0.439	-3.884	-0.022	-1.079*	0.710
	(0.519)	(0.482)	(0.465)	(0.975)	(0.862)	(0.669)	(3.247)	(0.485)	(0.570)	(0.626)
Marginal effects for CUT_POST5 * ROA	-0.249**	-0.087	-0.158*	-0.037	-0.113*	-0.071	-0.194*	-0.097	-0.143*	-0.329
Marginal effects for CUT_POST5 * RET	-0.031**	0.033	-0.034	0.046	-0.026	-0.032	-0.119**	0.071	-0.057*	0.043
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.20	0.16	0.18	0.17	0.17	0.18	0.14	0.19	0.16	0.23
Observations	1,876	1,888	2,013	2,273	2,115	2,173	1,879	2,369	2,924	1,322

Table 9: Tariff Cuts, Information Environment, and CEO Turnover

This table reports the results of a probit regression in which the dependent variable equals one if the CEO departs in year *t* and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. *Ret_Vol* is the standard deviation of daily returns during the year before the tariff cut. *Accuracy* is analysts' earnings forecast error measured by the average of the difference between realized earnings and analysts' earnings forecast during the year before the tariff cut. *Error_Disper* is the standard deviation of analysts' earnings forecast errors scaled by actual reported earnings during the year before the tariff cut. For each proxy and for each year, all firms in the same industry [two-digit standard industrial classification (SIC) codes] are divided into two subgroups based on whether the proxy in the year before is above (high) or below (low) the industry average. All other control variables are the same as those in Table 2, which are defined in Table A1. Year and industry fixed effects are included in all columns. Robust standard errors, clustered by two-digit SIC codes, are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Turnover

	Ret_Vol		Accuracy		Error_Disper	
	Low	High	High	Low	Low	High
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CUT_POST5	0.002	0.258**	-0.021	0.308**	0.061	0.262*
	(0.113)	(0.131)	(0.101)	(0.134)	(0.108)	(0.151)
ROA	-1.716***	-0.024	0.055	-0.361**	-0.181	-0.217
	(0.444)	(0.136)	(0.164)	(0.181)	(0.183)	(0.177)
RET	-0.295***	-0.238***	-0.252***	-0.263**	-0.350***	-0.162*
	(0.105)	(0.086)	(0.089)	(0.109)	(0.101)	(0.093)
Before	0.016	0.087	0.294*	-0.072	0.116	0.256
	(0.209)	(0.199)	(0.159)	(0.225)	(0.180)	(0.189)
Wald $\chi 2$ test for CUT_POST5 (*p*-value)		0.00***		0.00***		0.08*
Marginal effects for CUT_POST5	0.001	0.047**	-0.003	0.063**	0.010	0.030*
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.17	0.20	0.16	0.20	0.16	0.19
Observations	1,753	1,817	2,021	2,261	1,970	2,312

Panel B: Turnover-performance sensitivity

	Ret_Vol		Accuracy		Error_Disper	
	Low	High	High	Low	Low	High
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CUT_POST5	-0.000	0.245*	0.052	0.304**	0.097	0.164
	(0.122)	(0.139)	(0.105)	(0.145)	(0.114)	(0.127)
ROA	-1.217**	0.058	0.200	-0.322	0.004	-0.233
	(0.497)	(0.169)	(0.218)	(0.223)	(0.185)	(0.232)
CUT_POST5 * ROA	-1.886	-0.591*	-0.127	-1.047*	-0.126	-1.249*
	(1.173)	(0.342)	(0.388)	(0.563)	(0.327)	(0.654)
RET	-0.215*	-0.260**	-0.250**	-0.286**	-0.393***	-0.248**
	(0.115)	(0.109)	(0.101)	(0.141)	(0.113)	(0.106)
CUT_POST5 * RET	-0.160	-0.368**	-0.248	-0.256**	0.110	-0.367*
	(0.231)	(0.172)	(0.290)	(0.104)	(0.201)	(0.199)
Before	0.077	0.080	0.179	-0.261	0.147	-0.194
	(0.216)	(0.237)	(0.176)	(0.388)	(0.196)	(0.261)
Before* ROA	1.230	-0.774	-0.060	-3.480	2.024	-4.348
	(2.637)	(2.130)	(1.751)	(3.056)	(1.922)	(2.783)
Before* RET	0.241	-0.441	-0.058	-1.003	-0.147	-0.158
	(0.841)	(0.501)	(0.363)	(1.072)	(0.455)	(0.506)
Marginal effects for CUT_POST5 * ROA	-0.273	-0.116*	-0.045	-0.166*	-0.032	-0.206*
Marginal effects for CUT_POST5 * RET	-0.027	-0.063**	-0.039	-0.047*	0.018	-0.057*
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.17	0.20	0.16	0.20	0.16	0.19
Observations	2,013	2,273	2,021	2,261	1,970	2,312

Table 10: The Effect of CEO Turnover on Corporate Performance after Tariff Reduction

This table presents the difference-in-differences estimates for performance variables. The sample contains all firms experiencing substantial tariff reduction between 1992 and 2005. The treated firms are those that have CEO turnovers in any of the five years after the tariff reduction. The firms are matched in the year of the turnover by the logarithm of total assets, the two-digit standard industrial classification (SIC) code, and the implied probability of CEO departure from the probit regression in Column 1 of Table 2. *Profit margin* is operating income before depreciation divided by sales. *ROE* is net income divided by shareholder equity. *Sales growth* is the change of annual sales. *Q* is the Tobin's q. *TFP* is total factor productivity. For each performance variable, we compute the mean change three years before the turnover to three years after the turnover for treated firms (average treated difference), matched firms (average matched difference), and the difference between treated and matched firms (difference-in-differences). We present forced turnovers in Panel A and voluntary turnovers in Panel B. We report the absolute values of *t*-statistics in parentheses below the estimates. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Forced turnover

	Average treated difference	Average matched difference	Difference-in-differences
Profit margin	-0.034	-0.075	0.041*
			(1.81)
ROE	0.023	-0.137	0.160**
			(2.12)
Sales growth	-0.049	-0.347	0.298**
			(2.07)
Q	-0.386	-0.894	0.507
			(0.83)
TFP	-0.072	-0.183	0.111**
			(0.05)

Panel B: Voluntary turnover

	Average treated difference	Average matched difference	Difference-in-differences
Profit margin	-0.005	-0.008	0.004
			(0.28)
ROE	0.058	-0.194	0.251*
			(1.77)
Sales growth	-0.002	-0.030	0.028
			(0.35)
Q	-0.035	-0.211	0.176
			(0.91)
TFP	0.059	0.001	0.058
			(0.06)

Table 11: The Career Path of Departing CEOs

This table reports the results of a probit regression by categorizing the career path of the departing CEO following the turnover. In Columns 1 and 2, the dependent variable equals one if the departing CEO is offered an executive (CEO or vice president) or a director position in the new firm and zero otherwise. Column 1 includes forced turnovers and Column 2 includes voluntary turnovers. In Column 3, the dependent variable equals one if the departing CEO receives a higher pay in the new firm or works for a bigger firm or both and zero otherwise. In Column 4, the dependent variable equals one if the departing CEO's new firm shares the same four-digit standard industrial classification (SIC) code with the previous firm and zero otherwise. *CUT* is a dummy variable that equals one when an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry during the five-year period prior to CEO departure and zero otherwise. All other variables are measured in the year prior to the turnover and defined in Table A1. Robust standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Prob (*Employment*)		*Prob* (*Promotion*)	*Prob* (*Same Industry*)
	Forced	*Voluntary*		
Variable	(1)	(2)	(3)	(4)
CUT	-0.295**	-0.029	-0.280*	-0.256**
	(0.136)	(0.200)	(0.163)	(0.108)
Industry-adjusted ROA	1.083**	0.056	0.325	0.039
	(0.452)	(0.145)	(0.653)	(2.328)
Market-adjusted RET	0.305	-0.103	0.095**	-1.666
	(0.199)	(0.101)	(0.040)	(1.042)
Salechg	0.297	0.225	0.514	-1.161
	(0.328)	(0.182)	(0.682)	(2.044)
Assets	0.238***	0.154***	0.122	-0.264
	(0.057)	(0.037)	(0.109)	(0.288)
Q	0.102	0.011	0.145	0.375
	(0.067)	(0.027)	(0.199)	(0.321)
Age_dummy	0.025	0.611***	0.245	-0.786
	(0.184)	(0.112)	(0.507)	(0.654)
Volatility	0.852**	0.287	-1.155	-5.624**
	(0.363)	(0.220)	(1.167)	(2.632)
Constant	-2.767***	-1.134***	-1.517	4.869*
	(0.552)	(0.328)	(1.260)	(2.693)
Marginal effects for CUT	-0.096**	-0.009	-0.063*	-0.058*
Pseudo-R^2	0.187	0.175	0.156	0.289
Observations	260	677	133	133

Table 12: Subperiod Analysis

This table reports the results of a probit regression in which the dependent variable equals one if the chief executive officer (CEO) departs in year *t* and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. Column 1 (2) covers the sample period before (after) establishment of the World Trade Organization (WTO). Column 3 (4) covers the sample period in which the number of industries that experience substantial tariff reduction (*Contagion*) is above (high) or below (low) the sample mean. All other control variables are the same as those in Table 2, which are defined in Table A1. Year and industry fixed effects are included in all columns. Robust standard errors, clustered by two-digit standard industrial classification (SIC) codes, are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Turnover

Variable	Pre-WTO (1)	Post-WTO (2)	Contagion, low (3)	Contagion, high (4)
CUT_POST5	0.333	0.230***	0.028	0.228***
	(0.331)	(0.073)	(0.098)	(0.059)
ROA	-0.928	-0.117	-0.371**	-0.289**
	(0.645)	(0.129)	(0.177)	(0.129)
RET	-0.381	-0.241***	-0.265**	-0.233***
	(0.490)	(0.074)	(0.113)	(0.059)
Before	1.040***	0.139	-0.031	0.050
	(0.376)	(0.139)	(0.241)	(0.107)
Wald χ2 test for CUT_POST5 (*p*-value)		0.08*		0.00***
Marginal effects for CUT_POST5	0.047	0.041***	0.004	0.039***
Control variables	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Pseudo-R^2	0.19	0.16	0.14	0.15
Observations	663	3,625	1,689	2,599

Panel B: Turnover-performance sensitivity

Variable	Pre-WTO (1)	Post-WTO (2)	Contagion, low (3)	Contagion, high (4)
CUT_POST5	0.126	0.157*	0.165	0.140*
	(0.581)	(0.083)	(0.133)	(0.082)
ROA	-1.712***	-0.073	-0.122	-0.403**
	(0.628)	(0.155)	(0.149)	(0.168)
CUT_POST5 * ROA	-3.262	-0.608*	-0.614**	-2.867**
	(5.888)	(0.312)	(0.310)	(1.147)
RET	0.324	-0.249***	-0.222*	-0.238***
	(0.369)	(0.081)	(0.127)	(0.080)
CUT_POST5 * RET	-0.829	-0.244*	-0.173	-0.277**
	(1.155)	(0.135)	(0.277)	(0.136)
Before	0.283	0.023	0.009	0.034
	(0.456)	(0.178)	(0.272)	(0.151)
Before * ROA	6.109	-3.319	4.666	-0.676
	(4.169)	(2.414)	(3.851)	(1.523)
Before * RET	-3.328***	0.187	-0.880	-0.189
	(1.254)	(0.262)	(0.986)	(0.394)
Marginal effects for CUT_POST5 * ROA	-0.477	-0.122*	-0.119*	-0.479**
Marginal effects for CUT_POST5 * RET	-0.117	-0.042*	-0.025	-0.047*
Control variables	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Pseudo-R^2	0.23	0.16	0.16	0.16
Observations	663	3,625	1,689	2,599

Table 13: Robustness Check

This table reports the results of a probit regression in which the dependent variable equals one if the chief executive officer (CEO) departs in year *t* and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. Column 1 (2) contains firms with the *Herfindahl Index* of segment sales in the year before the event above (high) or below (low) the mean of all firms in the same industry [two-digit standard industrial classification (SIC)]. Column 3 (4) contains firms with multiple (single) segment. Column 5 has only firms with positive exporting sales. Year and industry fixed effects are included in all columns. All other control variables are the same as those in Table 2, which are defined in Table A1. Robust standard errors, clustered by two-digit SIC codes, are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Turnover

	Herfindahl Index		Segment		Exporting Firms
	Low	High	Multiple	Single	
Variable	(1)	(2)	(3)	(4)	(5)
CUT_POST5	0.269	0.251***	0.154**	0.866***	0.234**
	(0.235)	(0.076)	(0.074)	(0.264)	(0.116)
ROA	0.540	-0.183	-0.080	-0.558	-1.604***
	(0.918)	(0.137)	(0.134)	(0.463)	(0.358)
RET	-0.289	-0.229***	-0.235***	-0.059	-0.195**
	(0.265)	(0.076)	(0.080)	(0.203)	(0.099)
Before	-0.489	0.190	0.029	0.056	-0.156
	(0.531)	(0.131)	(0.150)	(0.320)	(0.201)
Wald $\chi 2$ test for CUT_POST5 (*p-value*)		0.09*		0.11	
Marginal effects for CUT_POST5	0.047	0.042***	0.026**	0.039***	0.040**
Control variables	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.17	0.17	0.16	0.23	0.16
Observations	1,936	2,350	2,996	1,290	1,521

Panel B: Turnover-performance sensitivity

	Herfindahl Index		Segment		Exporting Firms
	Low	High	Multiple	Single	
Variable	(1)	(2)	(3)	(4)	(5)
CUT_POST5	0.154	0.145*	0.079	0.394	0.149
	(0.318)	(0.086)	(0.085)	(0.289)	(0.164)
ROA	-0.995	-0.157	-0.369	-0.106	-1.475***
	(1.157)	(0.151)	(0.567)	(0.160)	(0.393)
CUT_POST5 * ROA	-1.144	-1.201***	-0.752	-0.580*	-1.041
	(1.407)	(0.399)	(0.747)	(0.338)	(1.282)
RET	-0.227	-0.241***	0.200	-0.266***	-0.131
	(0.249)	(0.084)	(0.218)	(0.087)	(0.110)
CUT_POST5 * RET	-0.147	-0.266*	-0.653	-0.313**	0.043
	(0.495)	(0.143)	(0.469)	(0.146)	(0.221)
Before	-0.157	0.035	0.027	-0.214	-0.241
	(0.162)	(0.155)	(0.168)	(0.333)	(0.271)
Before* ROA	-0.172	-0.643	0.716	-1.213	-0.967
	(0.138)	(1.539)	(2.428)	(1.842)	(2.029)
Before* RET	-0.485	-0.159	-0.145	-1.819	-1.621
	(0.367)	(0.393)	(0.418)	(1.286)	(1.777)
Marginal effects for CUT_POST5 * ROA	-0.567	-0.222**	-0.105	-0.186*	-0.219
Marginal effects for CUT_POST5 * RET	-0.025	-0.043*	-0.053	-0.128**	0.005
Control variables	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.21	0.16	0.17	0.24	0.16
Observations	1,936	2,350	2,996	1,290	1,521

Table A1: Variable Definitions

Variable	Definition
Salechg	Change of firm sales from year *t*-1 to year *t*
Assets	Logarithm of total assets in year *t*
Q	Tobin's q in year *t*
Age_dummy	Dummy variable that equals one if the age of the chief executive officer (CEO) in year *t* is over 65
Volatility	Standard deviation of firm monthly stock return from year *t*-5 to year *t*-1
ROA	Return on assets in year *t*
RET	Stock return in year *t*
Age	CEO's age in year *t*

Table B1: Industry Characteristics on Tariff Rate Change

This table reports results of ordinary least squares regressions that explain the change in tariff rate as a function of lagged industry (mean and median) variables. In Columns 1 and 2, the dependent variable is the annual variation of import tariff rates. In Columns 3 and 4, the dependent variable is a dummy that equals one if the industry experiences a substantial tariff cut and zero otherwise. The sample consists of all industries that are matched to the tariff data. Capital expenditures, research and development (R&D), acquisitions, cash holdings, debt financing, equity financing, and leverage are all scaled by total assets. All specifications include both year and industry fixed effects. Industry clustered standard errors are reported in parentheses below the estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	Dependent variable			
	Δ*Tariff rate*		*Large tariff reduction*	
Variable	Mean	Median	Mean	Median
Industry capital expenditures	-3.276*	-1.945	0.466	0.461
	(1.695)	(2.194)	(0.325)	(0.446)
Industry R&D	0.088	-2.459	-0.033	-0.512
	(0.263)	(2.132)	(0.035)	(0.436)
Industry acquisitions	10.356	4.413	-2.226	-1.827
	(7.935)	(7.767)	(2.125)	(1.669)
Industry cash holdings	0.414	0.619	-0.047	-0.020
	(0.528)	(0.774)	(0.103)	(0.113)
Industry log of total assets	0.063	0.046*	-0.026	-0.019
	(0.045)	(0.027)	(0.016)	(0.012)
Industry debt financing	0.624	0.451	-0.070	-0.019
	(0.446)	(0.384)	(0.071)	(0.077)
Industry equity financing	0.010	-0.017	-0.008	-0.000
	(0.121)	(0.225)	(0.050)	(0.052)
Industry leverage	0.001	0.026	0.000	-0.014
	(0.001)	(0.214)	(0.000)	(0.033)
Industry book-to-market	-0.000	0.006	-0.000	0.003
	(0.000)	(0.008)	(0.000)	(0.003)
Industry sales growth	0.001	0.109	-0.000	0.019
	(0.003)	(0.225)	(0.002)	(0.029)
Industry ROE	-0.001	-0.000	0.000	-0.000
	(0.002)	(0.000)	(0.001)	(0.000)
Industry return	-0.002	0.000	0.002	-0.000
	(0.006)	(0.001)	(0.002)	(0.000)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	2,107	2,107	2,107	2,107
R^2	0.14	0.14	0.13	0.13

Table B2: Linear Probability Regression with Firm Fixed Effects

This table reports the results of a linear probability regression in which the dependent variable equals one if the chief executive officer (CEO) departs in year *t* and zero otherwise. *CUT_POST*5 is a dummy variable that equals one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry and zero otherwise. *Before* is dummy variable that equals one if one or two years before a specific industry experiences a substantial tariff reduction. All other variables are measured in the year prior to the turnover and defined in Table A1. Year and firm fixed effects are included in all columns. Robust standard errors, clustered by two-digit standard industrial classification (SIC) codes, are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Variable	(1)	(2)	(3)	(4)	(5)
CUT_POST5		0.094***	0.051**	0.065**	0.030
		(0.021)	(0.021)	(0.027)	(0.029)
ROA	-0.019	-0.008	-0.009	-0.012	-0.025
	(0.017)	(0.037)	(0.036)	(0.033)	(0.036)
CUT_POST5 * ROA				-0.237**	-0.219**
				(0.106)	(0.103)
RET	-0.036***	-0.029**	-0.028**	-0.029**	-0.029**
	(0.009)	(0.011)	(0.011)	(0.011)	(0.012)
CUT_POST5 * RET				0.017	0.037
				(0.024)	(0.024)
Salechg	-0.007	-0.007	-0.003	-0.007	-0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Assets	-0.035***	0.016	0.020	0.026*	0.030**
	(0.012)	(0.015)	(0.015)	(0.013)	(0.015)
Q	-0.003	0.002	0.003	0.002	0.003
	(0.003)	(0.005)	(0.004)	(0.004)	(0.004)
Age_dummy	0.322***	0.332***	0.336***	0.327***	0.318***
	(0.011)	(0.015)	(0.015)	(0.014)	(0.016)
Volatility	0.061*	0.268***	0.306***	0.219***	0.301***
	(0.036)	(0.062)	(0.065)	(0.058)	(0.068)
Before			-0.001		-0.022
			(0.026)		(0.030)
Before * ROA					0.012
					(0.369)
Before * RET					0.016
					(0.051)
Constant	0.336***	-0.249**	-0.298***	-0.261***	-0.335***
	(0.099)	(0.111)	(0.111)	(0.100)	(0.108)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
R^2	0.16	0.15	0.17	0.15	0.16
Observations	4,288	4,288	4,288	4,288	4,288

Table B3: Linear Probability Regression and Subsample Analysis

This Table reports the results of linear probability regression where the dependent variable equals to one if the CEO departs in year t, and zero otherwise. CUT_POST5 is a dummy variable equals to one for the first five years after an industry has experienced a tariff rate reduction that is larger than three times the median tariff rate reduction in the same industry, and zero otherwise. *TFP* is total factor productivity, measured as the residual from the regression of the logarithm of net sales on the logarithm of net property, plant and equipment and the logarithm of the number of employees. *G-Index* is the governance index based on Gompers, Ishii and Metrick (2003). *WW Index* is based on Whited and Wu (2006). For each proxy, all firms in the same industry (2-digit SIC codes) are divided into two subgroups based on whether the proxy in the previous year is above (high) or below (low) the industry average. All other control variables are the same as those in Table B2, which are defined in Table A1. Year and firm fixed effects are included in all columns. Robust standard errors clustered by 2-digit SIC codes are in parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: Turnover

	TFP		G-Index		WW Index	
	Low	High	High	Low	High	Low
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CUT_POST5	0.058**	0.031	0.058*	0.005	0.129*	-0.126
	(0.028)	(0.033)	(0.030)	(0.037)	(0.075)	(0.155)
ROA	0.004	0.041	-0.053	0.073	-0.046	-0.022
	(0.050)	(0.058)	(0.044)	(0.070)	(0.091)	(0.051)
RET	-0.017	-0.026	-0.004	-0.041**	-0.042*	-0.010
	(0.014)	(0.017)	(0.015)	(0.019)	(0.024)	(0.015)
Before	-0.011	0.002	-0.004	-0.018	0.062	-0.014
	(0.035)	(0.043)	(0.041)	(0.043)	(0.057)	(0.047)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.20	0.18	0.23	0.20	0.19	0.13
Observations	1,965	2,316	2,765	1,520	1,876	1,888

Panel B: Turnover-performance sensitivity

	TFP		G-Index		WW Index	
	Low	High	High	Low	High	High
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CUT_POST5	0.062	-0.012	0.088**	-0.025	0.202**	-0.102
	(0.040)	(0.045)	(0.045)	(0.050)	(0.081)	(0.065)
ROA	-0.021	0.014	-0.074*	0.075	0.024	-0.051
	(0.050)	(0.057)	(0.044)	(0.071)	(0.094)	(0.053)
CUT_POST5 * ROA	-0.247**	0.009	-0.749**	-0.111	-1.075***	-0.026
	(0.121)	(0.308)	(0.351)	(0.106)	(0.406)	(0.146)
RET	-0.006	-0.043**	-0.012	-0.038*	-0.056**	-0.017
	(0.017)	(0.018)	(0.017)	(0.022)	(0.027)	(0.017)
CUT_POST5 * RET	-0.028	0.080	-0.038*	0.031	-0.048**	0.059
	(0.032)	(0.073)	(0.022)	(0.041)	(0.021)	(0.043)
Before	-0.025	-0.025	0.002	-0.061	-0.119*	0.022
	(0.041)	(0.047)	(0.047)	(0.047)	(0.069)	(0.055)
Before* ROA	0.214	-0.442	-0.587	0.756	-0.063	-0.129
	(0.446)	(0.744)	(0.492)	(0.715)	(1.085)	(0.785)
Before* RET	-0.013	0.058	0.008	0.012	0.130	-0.022
	(0.069)	(0.078)	(0.085)	(0.082)	(0.167)	(0.067)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.17	0.12	0.17	0.17	0.26	0.17
Observations	1,965	2,316	2,765	1,520	1,876	1,888