Tradeoff Analysis of Ousting the CEO

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Abstract

We explore the tradeoffs involved in having the possibility of ousting a CEO that is perceived by shareholders to be of low quality (bad type) or as badly behaved (low effort). We present the economic problem as analogous to a typical choice of a political system – similar to impeaching a nation's president – applied to the intrafirm environment. We propose a theoretical model where uncertainty on the CEO's ability plays a crucial role and is valued by the board of directors (or shareholders). Shareholders choose the optimal probability of ousting the CEO after receiving a bad signal on her effectiveness, given that they also value stability. Results show that this problem presents no interior solution: depending on parameter values, the board always impeaches the CEO or never does so (after a bad signal). Having this in mind, an ineffective CEO has an incentive to increase his performance, even at a personal cost, in order to achieve the threshold of performance (company earnings or profits for example) above which he is never kicked out.

INTRODUCTION

In this paper, we present the typical choice of a political system applied to the intrafirm environment. Basically, we want to deal with the tradeoffs involved in having the possibility of ousting a CEO that is perceived by the shareholders to be of low quality (bad type) or as badly behaved (low effort). Ousting a CEO is a common practice among companies and translates into a high CEO turnover in most countries.

Shareholders – or, indistinctively, the board of directors – value effectiveness. Effectiveness means that a CEO is able to implement an effective policy, one that maximizes profits and thus dividends to shareholders. This means that he/she is competent for the job and does not pursue primarily his/her personal agenda or incur in illegal objectives such as bribery or increasing unlawfully the probability of keeping the job. An ineffective CEO thus can be so because he is unsuited or because he is unethical. Thus, in the remainder, effective means both good type/competent and well/legal-behaved. Shareholders would like to pick and keep in office a CEO if and only if he is effective. (Notice that we do not consider unethical but efficient nor ethical but inefficient cases.)

We pose the following question: what is the optimal rule to oust a chosen CEO when shareholders suspect he is not effective? We assume that any decision must be taken under uncertainty: evidence is always preliminary *ex ante*, i.e. while the CEO holds the job. Moreover, bad current performance may either signal poor policy or a desirable short-term cost for a long-run benefit.

On the other hand, shareholders also value stability: given this uncertainty, it is not optimal to bring a CEO down after the first sign of ineffectiveness as it would generate a very high turnover and turmoil, leading to lower share prices and value of the company. Also, because effective CEOs need time to implement good policies.

The rationale behind the problem we want to study is similar to the discussion between parliamentary systems and presidential ones, in what concerns the easiness to oust a prime minister or impeach a president. In parliamentary systems, a government may go down without any accusations of illegal activities. The mere loss of political support, which typically follows bad performance in the short-run, is enough to lead to new elections. In the presidential system, however, it is often the case that the head of government can only be brought down after explicit charges of wrongdoing. The former system leans

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toward effectiveness, while the latter favors stability. The same tradeoffs are present in balancing effectiveness and stability of a firm's CEO.

The paper is organized as follows: section 2 reviews the literature while section 3 presents our theoretical model. Section 4 concludes the paper and sets the path for future research.

LITERATURE REVIEW

The literature we review next is twofold. On the one hand, there is a consolidated literature in the intersection of Management and Economics on the costs and benefits of ousting the CEO. On the other hand, there is a broad literature in political science and political economy on the political systems mentioned above: parliamentary *versus* presidential.

To the best of our knowledge there is no academic paper offering an economic modeling of the tradeoffs between stability and effectiveness involved in ousting a CEO.

On the Management literature, Helwege et al. (2012) is worth mentioning as they "examine the relation between institutional investors and management discipline over the last several decades to better understand how CEO turnover has increased". Their bottom line conclusion is that "the increasing size of institutional investors seems likely to inhibit voting with their feet while activism remains an important vehicle for change." In this paper we do not search for the specific roots of a high turnover but search for an optimal rule for ousting the CEO given the uncertainty about the reasons for deceiving performance.

Hermalin and Weisbach (1998) are concerned about the monitoring of the CEO by a board whose composition is influenced by the CEO. They model the bargaining game between the CEO and the board to fill its vacancies. They explicitly "assume no active role for the shareholders (although some of them could be directors)". In this paper, we commonly use "shareholders" as we originally where thinking of a family business, but could well say "the board" instead, and indistinctly. In spite of the different focus, their game sequence is quite similar to ours. Actually, the first three stages of their seven-stage game are identical to ours[3], except for the probability distributions adopted: they take a continuous normal distribution, we take a binary discrete distribution for the sake of simplicity. First, a new CEO takes the office, his type is unknown and follows a known distribution; then the first realization of earnings signals the CEO's true ability; then the board – or shareholders – decide to oust or keep the CEO.

A very recent paper is even more closely related to ours. Chemmanur and Fedaseyeu (2017) model – as we do – "a corporate board evaluating a CEO of uncertain management ability" where there is "a noisy private signal about CEO ability" followed by a decision "to retain or replace the CEO". Their focus, though, is on the structure of the board of directors – its size and composition play crucial roles for example – and they model each directors' behavior – and there is an individual cost of dissent (if a director votes to oust but it does not win) and thus incentives to not truthfully reveal the signal received individually. While their unit of analysis is each director, we take the board as a single entity[4], abstracting from the coordination problems which drive their results. In their paper, each director cares about true CEO ability, since it affects their equity holding values; here it is the board as whole that cares the same way. Our choice variable is different, though: the board decides on the optimal probability of ousting a CEO after receiving a bad signal – and we model the reaction of the CEO behavior in anticipation of that decision on the probability. Another difference between the two papers is that their focus is on ability – and leave aside effort – while we deal with a combination of both, which we call effectiveness.

Robinson and Torvik (2016) does a similar job as ours, of a similar tradeoff between effectiveness and stability, but not in the intrafirm context - in political science instead. However, they focus on very different dimensions of parliamentary and presidential systems, not specifically on the easiness of ousting the office holder. They assume "minorities are relatively powerful in a parliamentary system compared to a presidential system, and second, that presidents have more power with respect to their own coalition than prime ministers do". Robinson and Torvik (2016) "develop a model to understand the

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[3] The remainder four stages of their game deal precisely with the bargaining of the CEO and the board on filling board vacancies and the independence of the board and its capacity to monitor the CEO.

[4] And, as mentioned before, we most of the times call it "shareholders", instead.

incidence of presidential and parliamentary institutions", but do not focus on the presidential institution of impeachment or the parliamentary one of vote of no confidence, which are analogous to our easiness of ousting a CEO. However, we deal with an easiness to oust a CEO in a continuous space, not a dichotomous one like a binary choice of political system.

As such, we are closely related to the recent literature on "the proximity between presidentialism and parliamentarim", as Vila-Nova and Simon (2016) named their article, exemplifying their arguments with the Brazilian case of two impeachments under the constitution in force (1992 and 2015/2016).

Also based on Latin American recent experiences, Figueiredo (2013) names her paper "The Parliamentarization of presidentialism?". She argues that on top of "more frequent removal of presidents before the end of their mandates" there are also "specific institutions" and "the politics of government formation and lawmaking" used by those presidential systems that reduce the gap between them and a parliamentary regime.

Albert (2009) goes further and names his piece as "the fusion of presidentialism and parliamentarism". His claim is that the structural differences of the two "systems of governance" do not imply functional differences; actually both systems can be quite alike, as political culture shapes the system in force.

All the Political Economy papers in this literature, thus, claim on a less than discrete choice of regimes, but instead a choice in a continuous space of parameters of particular institutions. The easiness of ousting the leader is one of them in a choice of political system, as claimed by this recent literature, but definitely the case within a firm. This approach is present in the model we present next.

THE MODEL

This section presents our theoretical model. The timing of the game is as follows. Firstly, the shareholders (or board of directors) appoint a CEO and define an *ex ante* probability q of ousting her in case a bad signal shows up. Secondly, the market result takes place (low or high profit, for example) and shareholders get a signal on the CEO effectiveness. Then, they decide to oust or not the CEO.[5]

THE BENCHMARK CASE

Shareholders' expected utility (*ex ante*) is U^e: with probability p, the chosen CEO has high quality and delivers utility u_h; with probability $(1 - p)$, she has low quality and delivers u_l.

In case the CEO has high quality, the shareholders get a high payoff $\bar{u}$ today, and the expected utility U^e in the following period when shareholders make a new choice (of a new CEO for a new term in office), discounted to date 0 by the factor δ. If she has low quality, there is a probability q that shareholders will be able to oust her today and have a new one appointed immediately, yielding again the expected utility U^e. With probability $(1 - q)$, the ousting process fails, the low-quality CEO stays in office, delivers low utility $\underline{u} < \bar{u}$, and again in the the following period a new CEO is chosen and shareholders get δU^e. In any case, there is a cost ξ of the ousting process, which may be interpreted as shareholders' preference for stability. This may be summarized as follows.

$$U^e = pu_h + (1 - p)u_l$$
$$u_h = \bar{u} + \delta U^e$$
$$u_l = qU^e + (1 - q)(\underline{u} + \delta U^e) - \xi$$

One may plug the expressions for u_h and u_l into the first line to get:

$$U^e = [p\bar{u} + (1 - p)(1 - q)\underline{u} - (1 - p)\xi] / (1 - \delta)[1 - (1 - p)q]$$

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[5] In the extension discussed in the following subsection, we endogenize the effort of the CEO, which influences the company result in the second stage, and thus its choice for q in the first stage, which will be shown in this benchmark case to be a binary one, i.e. a corner solution of q* = 0 or q* = 1.

Shareholders maximize their expected utility by choosing an institutional arrangement that will determine when the CEO will be removed from office – that is, they choose $q \in [0, 1]$ to maximize U^e. Since the expression above is differentiable in q, one may compute the following derivative:

$dU^e/dq =$

$-\{(1-p)\underline{u}[(1-\delta)(1-(1-p)q)] + (1-\delta)(1-p)[p\bar{u} + (1-p)(1-q)\underline{u} - (1-p)\xi]\} / \{(1-\delta)[1-(1-p)q]\}^2$

The expression above is well-defined for $\delta, p, q \in (0, 1)$. Notice that the denominator is strictly positive, and the sign of the derivative depends only on the numerator. After some tedious algebra, and defining $\Delta u = \bar{u} - \underline{u} > 0$, this reduces to:

$dU^e/dq \geq 0 \Longleftrightarrow p\Delta u - (1-p)\,\xi \geq 0$

This does not depend on q, implying that it will generally be either positive or negative: combinations of parameters that make $dU^e/dq = 0$ have zero measure. In other words, there will be a corner solution except for a zero-measure set. This means that shareholders never choose an intermediate probability of ousting the CEO: the optimal institutional design has a bang-bang structure. (And for the purposes of the next subsection, the CEO knows it.)

Consider first the case with zero ousting cost - i.e. when there is no instability or any problems in removing a low-performance CEO from office. Then $\xi = 0$ and $dU^e/dq = p\Delta u > 0$, implying that the optimal choice is $q^* = 1$: shareholders get rid of the CEO as soon as they receive some signal about his low quality/effectiveness.

The opposite case happens for example when the delivered utility is the same irrespective of the CEO's type. In such case $\Delta u = 0$ and then $dU^e/dq = -(1-p)\xi < 0$, implying that the optimal choice is $q^* = 0$: shareholders prefer to wait for the end of the CEO's term in office to appoint a new one.

Notice lastly that $p\Delta u - (1-p)\xi$ is increasing in p: when the probability of making a good choice is high, the willingness of shareholders to oust a bad CEO increases, as they become confident that it is unlikely they will make a poor choice again. At the first sign of low effectiveness, impeachment takes place.

Hence, a company with higher gap between the performance of an effective and an ineffective CEO (i.e. a higher Δu) and a low cost of ousting a CEO, or low instability derived from that (i.e. a low ξ) will tend to be more unstable (meaning that it changes CEOs more often, i.e. has a higher CEO turnover), all else equal. However, this conclusion does not take into account the CEO's incentive to perform well enough.

ENDOGENOUS CHOICE OF QUALITY

We now consider the decision of a low-quality CEO that may choose to increase $\underline{u}$ at some personal cost (for simplicity, and without loss of generality, we take $\bar{u}$ as given). If the CEO chooses $\underline{u}$ such that $dU^e/dq \leq 0$, he keeps his job, as shareholders will choose $q^* = 0$. This happens for the following level of $\underline{u}$:

$\underline{u}^* = \bar{u} - \xi[(1-p)/p]$

So $\underline{u}^*$ is the threshold of utility a low-quality CEO is willing to offer shareholders. Notice initially that if $\xi = 0$ or $p = 1$, then $\underline{u}^* = \bar{u}$. Otherwise, $\underline{u}^* < \bar{u}$: whenever there is a cost of the ousting process and some positive probability of a bad choice, shareholders are not able to achieve the highest level of utility $\bar{u}$. Interpretation is straightforward: if there is no cost of substituting a low-performance CEO and he is able to choose the quality of his performance, then high-performance is always implementable (even by a low quality CEO), and the probability p of a wrong choice becomes irrelevant.

So far, we have treated $\bar{u}$ and ξ as separate variables. However, it is often the case that they are related: the cost of the ousting process may be computed as a proportion of the benefit to shareholders. This is the case, for example, if they anticipate that starting the process will decrease profits by one third (or any

other proportion) in a given period. In other words, one may write $\xi = au$ for some parameter a in the interval (0,1). The expression for $\underline{u}^*$ becomes:

$\underline{u}^* = \bar{u}\ [1 - a(1 − p)/p]$

Consider for example $a = 30\%$ and $p = 90\%$. One may compute $\underline{u}^* = 0.97\bar{u}$, so that the loss of profits due to the possibility of choosing a bad CEO is small. Even for a large probability of mistake $p = 50\%$, the loss in profits is just 30%. When p is large (for example, 0.9), then losses are never higher than 10%, even for a close to one. However, the impact of a given decrease in p – e.g., from 90% to 50% – depends heavily on a. While profits decrease from $0.97\bar{u}$ to $0.70\bar{u}$ for $a = 0.3$, they go from $0,9\bar{u}$ to only $0,1\bar{u}$ if $a = 0,9$, so that shareholders may simply shut down the firm. Hence a given decrease in p cuts profits (under a bad CEO) in 28% for low a but this figure increases to 89% for high a. (One may relate this to the cross-derivative of the expected utility with respect to a and p.)

The table below summarizes some numerical results (notice that the last column computes profit losses conditional on choosing a bad CEO – one may evaluate the ex-ante loss using q to compute expected utilities, with analogous results).

Loss in Profits		
a	P	$\underline{u}^*/\bar{u}$
	0,9	96,7%
0,3	0,7	87,1%
	0,5	70,0%
	0,9	94,4%
0,5	0,7	78,6%
	0,5	50,0%
	0,9	90,0%
0,9	0,7	61,4%
	0,5	10,0%

In short, the cost a of the ousting process (in terms of forgone profits) is irrelevant as long as the probability p of choosing a good CEO is high, but it affects decisively the impact of *changes* in this probability on the firm's results. Policy implications are clear. On one hand, firms may disregard variations in p (the probability of choosing a bad CEO) as long as a (cost of the ousting process in terms of profits) is low: while the time dedicated to increasing the probability of making a good choice is costly, returns are low. On the other hand, a given decrease in p has a large impact on profits when ousting is very costly.

CONCLUSION
Good institutions limit the scope of human misbehavior. We studied the impact of firm design concerning one of the most important decisions the owners (i.e., shareholders) or the board of directors can make: picking a CEO to run the company. Just like any choice subject to uncertainty, shareholders may find that the pick was a bad one, and the appointed individual is not fit for the job. One must then answer whether and how to oust the CEO. Even if there is hard information that the CEO is incompetent, there is a non-trivial process concerning the ousting process, which is costly: when part of the resources are allocated to this process, the business itself may be hurt, and there is always a chance that another

poor performance CEO will be picked again in the following period. A tradeoff arises: triggering a process to fire a bad CEO may generate a benefit if he is substituted by a good one, but there is a price to be paid in terms of instability.

We showed that the optimal institutional design has a bang-bang property: shareholders choose either to oust the CEO as soon as they receive some signal that he is unfit for the position, or they leave him in office irrespective of his inability to run the company. If a bad CEO may choose the quality of his performance, subject to some personal cost, then he offers the lowest quality that will guarantee that shareholders will not choose to dismiss him for poor performance. This quality will be higher when the probability of choosing a good CEO is high and when the instability cost of the ousting process is low. Quantitatively, we show that the impact of the cost of instability is irrelevant for a given (high) probability of a good pick; however, this cost affects the impact of a change in this probability, and may be the difference between sustaining a lower profit or going bankrupt.

Lastly, we notice that the discussion above is closely related to the design of political systems: the ousting of a CEO bears some resemblance to the impeachment of a president, leading to the debate between presidential and parliamentary systems. This research agenda should advance in order to highlight similarities and differences between dismissing leaders in the public and in the private sectors.

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