Favoritism, Influence and Employee Incentives in Large Organizations

Nov 20, 2015

Abstract

This article provides new empirical insight and theoretical analysis on the incentive provision of white collar employees in large organizations. With 20 years of personnel data from a large US firm, we show that employee performance displays a unique pattern: performance decreases as employees stay longer in one position, jumps up upon promotion, and decreases again until the jump at the next promotion. This pattern of performance is at odds with the human capital theory and cannot be explained by incentive theories under the classical principle-agent framework. We propose an enriched principle-manager-employee framework to capture the important fact that the output of most white collar employees are hard to measure and have to be subjectively evaluated by managers, who are self-interested agents themselves in large organizations. We show that, real life complications such as favoritism and influence could constrain the firm’s ability to optimize employee’s effort in a way that would generate equilibrium effort choices that is consistent with what we observe in the data.
1 Introduction

Optimal incentive provision is an essential aspect of firm management. Despite the abundance of economic studies on this topic, much of the focus is placed on the incentive contracts of workers whose output are easily observed and measured. As noted by Prendergast (1999), although studies on occupations such as CEOs and mutual fund managers shed important light on how incentives operate, most people do not work in positions like this. Compared to the large body of literature on managers, the incentives and performance of ordinary employees, especially those in white collar positions with hard to measure output, receives little attention. This paper studies performance and incentives of those ordinary employees and the contributes to this important but much neglected aspect of the literature with new empirical and theoretical insight.

With 20 years of personnel data from a large US firm in the service industry, we find that employee performance displays a unique non-monotonic pattern that was never discussed in previous literature. Performance does not simply increase, decrease or move in an inverted U pattern. Instead, there is a strong connection between performance and employee’s movement along the career path. Performance gradually decreases when an employee stays in the same position for longer, and jumps back up when he is promoted into a higher level. Given that it is generally believed that efficiency at a position should increase with acquisition of skills and experience, such an odd pattern of performance seem to suggest decreasing employee effort with position specific seniority.

The question raised by the empirical findings is then: why would employee effort, presumably induced under the firm’s optimized incentive schemes, notably decreases with employee’s position specific seniority. A natural response to the question would be that employee effort decreases because of reduced implicit career concerns as in Holmstrom (1982, 1999). As employees stay longer in the
same position, their performances make less and less impact on the manager’s learning over their ability and assessment of their suitability for promotion, which reduces the implicit incentive for them to perform well.

Although the decreasing impact of performance on manager’s learning offers important insight on what is driving the decreasing effort, the career concerns story alone cannot satisfactorily explain the decreasing effort pattern we observe in the data. Promotion, among others, is only one of the many ways the firm could incentivize employees. Gibbons and Murphy (1991) shows that the firm’s optimal incentive scheme should optimize the overall incentives and neutralize decreasing career concerns with increasing explicit incentives. They also find support for that with data on CEO compensations. Gibbons and Murphy result explains why, despite the decreasing career concerns, we almost never observe negative correlation between CEO tenure and performance.

In contrast to the optimized overall incentives for higher managers, based on both common observations and our empirical findings, it seems that firms are not doing the same kind of optimization for ordinary employees. Instead of just conceding that firms are not optimizing because they care less about incentives of ordinary employees, we could be more constructive and look into the reasons why the firm’s ability to optimize ordinary employee’s incentives might be constrained.

One special aspect about the incentive provision for ordinary white collar employees is that, most of the times, their output cannot be easily measured and assessments of their performance often depend on manager’s subjective evaluations. The subjective evaluation by managers, who are self-interested agents themselves in large organizations, adds another layer to the usual principle-agent framework for the analysis of the incentive provision of ordinary employees in large organizations.
Managers, being human-beings with personal likes and dislikes, are not invulnerable to personal favoritism and influence activities as discussed in Pendergast and Topel (1996) and Milgrom and Roberts (1988). The fact that managers may derive private benefit from rewarding their favored employees opens up the possibility that subjective evaluations are distorted by favoritism, and such favoritism furthermore induces employees to engage in interpersonal influence activities to gain the manager’s favor. Such complications not only introduce addition influence cost for incentive provisions but also affect the firm’s choice over different incentive instruments.

In our theoretical analysis, we propose an enriched principle-manager-employee framework to study the optimal incentive provision for ordinary employees under real life complications such as favoritism and influence. Our model is different from the usual principle-agent framework in that, instead of assuming that the setting of incentive schemes, monitoring of employees and the execution of incentive schemes are all done by “the principle”, we assume the monitoring and execution are delegated to managers. Furthermore, managers are not always impartial. They derive private benefit from exercising their own preferences over employees and must be disciplined away from doing so.

One important result arising from the possible existence of manager’s favoritism is that, certain incentive instruments are less prone to the problem of favoritism than others and would be preferred by the firm. In particular, the difference lies in whether the reward for performance has only distributional consequences or would have direct impact on the firm’s future output. To illustrate the point, take for example a tournament with monetary bonus vs promotion as the reward. For now, let us move away from relational contracts and long term reputations and consider a two period case. When the reward is monetary, who wins the reward in the first period has no direct consequence on the production
in the second period. On the other hand, if the reward is promotion, it matters whether those who win are those who would be most productive at the higher level. If better performance are associated with better suitability for promotion and manager’s compensations are tied to the firm’s output, using promotion as the incentive instrument would give managers the implicit incentive to reward those who performed well rather than those they favor while using monetary bonus would not. Given the different subjectivity to favoritism, firms would rely more heavily on promotion incentives compared to monetary bonus than they would in the absence of such complications.

Besides the weakened desirability of using monetary bonus rewards under concerns of favoritism, the possibility of influence activities further limits the firm’s ability to induce effort through optimal promotion rewards. If there is no concern for influence activities, although additional performance do have a smaller impact on promotion probability as position specific seniority increases, the firm could optimally respond to that by making the rewards larger. In the case when employees are risk neutral, it is not hard to show that the optimal promotion reward scheme would induce the same level of effort for employees with different position specific seniority. Although risk aversion may change the result towards lower effort levels for more senior employees, it would not change the prediction that the firm should increase the reward associated with promotion for those with higher position-specific seniority. On whether firms actually do that in real practice, both casual observations and our data suggests otherwise. If there is the concern for influence activities, however, why firms do not raise the reward on promotion to counter the decreased learning effect can be easily explained. Under the possibility of influencing the manager, employees basically have two ways to increase their chance of promotion. They could either invest in higher productive effort to achieve better performance or
invest in wasteful influence activities to gain the manager’s favor. As employees get more senior at the position, benefit of better performance decreases as the learning completes, benefit of influence activities can be reasonably assumed to remain roughly the same. As a result, more senior employees would direct more attention on influence activities compared to productive activities, making it more costly for the firm to induce productive effort from them.

With the complications of favoritism and influence activities, firms are both constrained to use heavy monetary bonus rewards as well as optimize the promotion rewards for employees with higher position specific seniority. The combined effect would generate equilibrium employee effort that is consistent with our empirical observations: effort decreases with position specific seniority and also reverts higher upon promotion as the learning re-initiates.

Since our empirical findings are based on the analysis of the data from a single firm, it naturally raises the question of whether what we observe is just a special case. Although we are the first to describe and discuss the non-monotonic pattern of employee performance, there is a large related literature on performance and overall organizational tenure. In their influential paper, Medoff and Abraham (1980) shows evidence of negative association between performance ratings and organizational tenure with data from two large firms. Later studies, such as Flabbi and Ichino (2001), find similar negative association between performance and tenure using more direct measures, such as recorded absenteeism and misconduct episodes. Although these studies did not look into the exact pattern of decreasing performance as we do, the overall negative correlation supports the possible existence of similar performance patterns as in our data.

The rest of our paper is organized as follows. We present the general description of the data and show our empirical findings in section 2. Section 3 provides the set up of the principle-manager-employee framework and the analysis of
2 Empirical Findings

The data set we use for our empirical findings contains the personnel records of a large U.S. firm in the service industry over the years 1969-1988. The dataset is constructed by Baker, Gibbs and Holmstrom from the firm’s personnel tapes and detailed records of the data and the firm can be found in Baker, Gibbs and Holmstrom (1994a). There are a total of 74,071 employee-year observations. Each observation contains information on employee’s ID, age, sex, education, job title, salary, bonus and performance rating.

The firm under investigation is a typical hierarchical firm with multi-layers and white-collar jobs. There are a total of eight job levels from the entry positions to the CEO.¹ The bottom 4 levels contain 97.5% of the total employees and 95% of the employees in levels 1-4 are in product creation/selling positions or staff positions such as accounting, finance and human resource. Within levels 1-4, the size of each higher level is only slightly smaller than the lower level. At level 5, the size of the level shrinks significantly to only about 10% of level 4 and remains small in levels 6-8. In higher levels, jobs are mostly associated with planning and general management. In levels 1-4, the average bonus is less than 7% of the base salary. The average bonus size jumps to around 14% in levels 5-6 and 22% in levels 7-8.

According to position characteristics, we consider those in levels 1-4 in the data as “the employees” and those in levels 5-8 as “the managers” in our model.

¹The hierarchy of the firm is back constructed from moves between jobs. The details on the construction of the hierarchy can be found in Baker, Gibbs and Holmstrom (1994a).
Since we are interested in investigating the effort dynamics of the ordinary white-collar employees, we shall conduct our empirical analysis on the 97.5% of employees in levels 1-4.

**General Pattern of Employee Performance**

We shall use the performance rating score as our primary measure of employee’s performance. The performance rating of employees is administrated once a year and is given on the 1-5 scales. In the original data set, the ratings are coded in descending order, with 1 being the higher rating and the 5 meaning the worst. For easier interpretation, we recode the ratings in ascending order, with 1 meaning the worst performance and 5 the best. Observations of performance ratings show the leniency bias: scores are concentrated on the higher end, with those receiving rating 1-2 accounting for only about 1% of the data. The overall percentage of observations with ratings 3, 4 and 5 are 18%, 50% and 31% respectively.

A general picture of the dynamics of employee performance is illustrated in Figure 1. Figure 1 shows the distribution performance rating scores of a fixed set of employees through the first 5 years in levels 1-4. To avoid selection bias from promotion or exit, we included only employees who have stayed more than 5 years before promotion or exit for each of the levels shown.
Figure 1: Distribution of ratings scores for employees who have stayed more than 5 years at each level.

We can see from Figure 1 that there is a clear pattern of decreasing performance ratings with position-specific seniority. The percentage of employees receiving the best rating 5 is around 60% in the first year at level 1. That quickly drops to less than 20% in the third year at level 1 and to around 10% in the 5th year. The percentage of employees receiving rating 4 remains roughly stable, while the percentage receiving rating 3 greatly increases. The cases of ratings 1-2 are rare and are notable only in the fourth and fifth year at level 1. The pattern is similar at all other levels.

**Fixed Effect Regression Analysis**

Since the pattern illustrated in Figure 1 is based on a restricted sample, we shall next examine whether the illustrated pattern holds for the general population of employees through regression analysis. To avoid selection bias
due to unobserved innate ability, we investigate the relationship with fixed effect models.

The results from the fixed-effect linear and ordered logit regressions of employee’s performance ratings on position-specific seniority, tenure and level of position are presented in Table 1. Column (1) and (2) shows the result from the fixed-effect linear regression with level of position not included in (1) and included in (2). Column (3) and (4) shows the result from fixed-effect ordered logit estimation with level of position not included in (3) and included in (4).\textsuperscript{2}

\begin{table}[h]
\centering
\begin{tabular}{lccc}
\hline
 & Independent Variable & Fixed Effect Linear Regression & Fixed Effect Ordered Logit \\
 & & (1) & (2) & (3) & (4) \\
\hline
Year at Position & -0.062*** & -0.049*** & -0.19*** & -0.17*** \\
 & (0.0035) & (0.0046) & (0.027) & (0.034) \\
Tenure & -0.012*** & -0.027*** & -0.052*** & -0.078*** \\
 & (0.0022) & (0.0042) & (0.016) & (0.029) \\
Level of Position & 0.062*** & 0.14 \\
 & (0.013) & (0.12) \\
Constant & 4.36*** & 4.25*** \\
 & (0.0092) & (0.022) \\
\hline
Observations & 34,574 & 34,574 & 34,574 & 34,574 \\
No. Employees & 8,863 & 8,863 & 8,863 & 8,863 \\
\hline
\end{tabular}
\caption{Fixed effect linear and ordered logit regression of performance ratings on position specific seniority, tenure and level of position.}
\end{table}

The results represented in Table 1 is consistent with the pattern shown in Figure 1. There is a consistent and significant negative relationship between position-specific seniority and performance ratings across all specifications. The result in column (2) suggests that, an extra year at the position decreases performance rating by approximately 0.05, which gives an decrease of a quarter grade with 5 extra years. Since most of the performance ratings are between 3-5, the

\textsuperscript{2}The estimation method we used is the BUC estimation proposed in Baetschmann, Staub and Winkelmann (2011).
estimate suggests a quite notable effect of decreasing performance as employee’s position-specific seniority increases. Employee’s overall tenure at the firm also has a negative effect on employee’s performance. However, the magnitude of the effect is much smaller compared to that of position-specific seniority in all specifications.

The fact that the main driving force behind decreasing employee performance is position-specific seniority rather than overall tenure is important and predicts that performance not only decrease with years when employees stay at one level, but also jumps up at promotion as the position-specific seniority reverts back to zero.

What’s more, the estimated effect of the level of position is positive. The level effect adds further to the jump in performance upon promotion and may negate the negative effect of tenure for promoted employees. With specification 2, the magnitude of the positive effect of level is more than 2 times larger than the negative effect of tenure. If an employee is promoted from after 2 years at level 1, the estimated result would predict that, the expected rating that the employee would receive is actually higher at his first year at level 2 compared to his first year at level 1.

If level is not controlled for, the positive effect of level could severely bias the estimated effect of tenure on performance, as evidenced by the difference of the estimated coefficient on tenure between specification (1) and (2). If the level effect is large enough, it is possible that a uncontrolled regression of performance on tenure would show no relationship between performance and tenure as some of the previous studies have found.

**Alternative Measure of Performance**

Since performance ratings are subjectively evaluated, it is a natural concern whether decreasing performance ratings indeed suggests decreasing real perfor-
mance. Consider the possibility that evaluators raise the standard of evaluation as employee’s position-specific seniority increases. If the increase in performance with higher experience does not catch up with the raise in evaluation standard, performance rating would decrease even if employee’s effort does not.

To address this concern, we re-test the relationship with the recipient of bonus being an alternative measure for performance. Employees with better performance should be more likely to receive a positive bonus. In contrast to rating scores, it is less likely that the firm bias the standard for getting a bonus and making the winning of bonus more difficult for equally well performed but more senior employees.

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Fixed Effect Logit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Year at Position</td>
<td>-0.33***</td>
<td>-0.21***</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.022)</td>
</tr>
<tr>
<td>Tenure</td>
<td>-0.06***</td>
<td>-0.21***</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.025)</td>
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<tr>
<td>Level of Position</td>
<td>0.49***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.064)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
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<td>13,335</td>
</tr>
<tr>
<td>No. Employees</td>
<td>2,812</td>
<td>2,812</td>
</tr>
</tbody>
</table>

Table 2: Fixed effect logit regression of the recipient of bonus on position specific seniority, tenure and level of position.

The result of the fixed-effect logit regressions of recipient of bonus on position-specific seniority, tenure and level of position regression is presented in Table 2. We can see that the results shown in Table 2 is consistent with those in Table 1. The effect of position-specific seniority and tenure are significantly negative, with the effect of position-specific seniority larger. The effect of level of position
is negative.

Given that the same pattern of changes is predicted with the recipient of bonus as the alternative measure of performance, it is unlikely our results established in the previous section is due to changes of rating standard.

**Interpretation of the Empirical Result**

The empirical result we have shown above is interesting as it shows the opposite of what general human capital theories would predict. As employees stay in one position longer, they acquire skills and become more efficient at their tasks. If the performance ratings were to reflect such human capital acquisitions, we would expect the performance ratings to increase rather than decrease with years at the same position and jumps down rather than up at promotion.

If we believe that the performance ratings reflect real performances and are not just randomly biased against more senior employees, the discrepancy between the observed performance and productivity can only be explained by changes in employee's effort. Our empirical result suggests that employee effort decreases with position specific seniority and reverts back upon promotion. In the next section, we shall provide theoretical analysis on how this odd pattern of employee effort could arise as equilibrium outcome even after the firm has optimized the incentives for employees.

### 3 Model and Analysis

#### 3.1 The Model Setup

We shall consider here a firm with three groups of actors: the principle, the manager and the employees. The firm is owned by the principle. The manager monitors the employees and makes management decisions. Production is car-
ried out by employees. Tasks that each employee carries out are complex and multi-dimensional. We assume that while the aggregate output of the firm is measurable and contractible, each individual employee’s contribution to output is hard to measure and not contractible.

We assume that at least some aspect of employee’s performance cannot be objectively measured but can be subjectively evaluated by managers. In each period $t$, the manager privately observes a signal $\eta_{jt}$ on employee $j$’s performance:

$$\eta_{jt} = a_j + e_{jt} + \epsilon_{jt}. \quad (3.1)$$

The performance signal $\eta_{jt}$ is influenced by the employee’s ability $a_j$, effort $e_{jt}$ and a random noise term $\epsilon_{jt}$. We assume that employee’s ability $a_j$ is job specific and initially unknown to either the firm or the employee. The prior of $a_j$ is normally distributed as $N(a_0, \sigma_0^2)$ and the observational noise $\epsilon_{jt}$ follows $N(0, \sigma_\epsilon^2)$.

Besides observing employee’s performance, the manager also forms personal preferences over employees. Let $f_{jt}$ measure the manager’s preference over employee $j$ in period $t$, we assume that $f_{jt}$ is influenced by both the manager’s previous preference $f_{jt-1}$ and the employee’s effort in interpersonal influence activities $i_{jt}$. We would like to interpret $f$ is a comparative measure and normalize the impact of $i_{jt}$ as $i_{jt} - E(i_{jt})$ keep the mean of $f_{jt}$ zero. Let $f_{j0} \sim N(0, \sigma_f^2)$ denote the manager’s initial preference, the manager’s preference $f_{jt}$ can be expressed as:

$$f_{jt} = f_{jt-1} + [i_{jt} - E(i_{jt})] = f_{j0} + \sum_{s=1}^{t} [i_{js} - E(i_{js})]. \quad (3.2)$$
The Employee’s Incentives

Employees privately choose their effort $e_{jt}$ in productive activities and $i_{jt}$ in influence activities in each period. Let the employee’s cost function be $c(e_{jt}, i_{jt}) = c_e e_{jt}^2 + c_i i_{jt}^2$. To focus on the impact of favoritism and influence activities on employee’s incentive provision, we abstract away from the well-studied insurance vs. incentive trade-off and assume that employees are risk neutral.

Let the incentive scheme for employees take the simple two step form: a certain number of employees receives an extra reward $R$ while all the others receive only the base wage $w$.\(^3\) Let $p(e_{jt}, i_{jt})$ be the probability of receiving the reward, the utility of employee in period $t$ is then:

$$u^E(e_{jt}, i_{jt}) = p(e_{jt}, i_{jt}) R + w - c(e_{jt}, i_{jt}).$$

(3.3)

The Manager’s Incentive

In contrast to usual models of incentive provision that take managers as the principle, in our model, managers are also self-interested agents who take actions to maximize their own utility.

Let the manager be risk neutral and care about his compensation as well as his personal preferences towards employees. There are two central assumptions we would like to make about the manager’s incentives. First, we assume that the manager’s compensation is tied to the output of the team he monitors and that the aggregate output the the team can be better measured and contracted on than individual output. Second, we assume that the manager prefers to see employees that he likes better to receive performance rewards.

Let $y_{jt}$ be employee $j$’s output and the team’s output be $Y_t = \sum_j y_{jt}$. Let $\theta$ be the sensitivity of the manager’s compensation to the team’s output, the

\(^3\)It suffice to study this simple form of incentive scheme as the shape of the reward function does not matter under the risk neutrality assumption.
The manager’s compensation is specified as:

\[ w(Y_t) = 0Y_t + w = 0 \sum_j y_{jt} + w. \]  \hfill (3.4)

Let \( B_t \) be the set of employees who receive the performance reward in period \( t \) and let \( u_f \) measure the utility that the manager derives from favoritism, we assume that \( u_f \) increases with \( f_{jt} \) of the rewarded employees:

\[ u_f(B_t) = \sum_{j \in B_t} f_{jt}. \]  \hfill (3.5)

Combining (3.4) and (3.5), the manager’s overall utility in period \( t \) is then:

\[ u(Y_t, B_t) = 0 \sum_j y_{jt} + w + \sum_{j \in B_t} f_{jt}. \]  \hfill (3.6)

3.2 Choice of Incentive Schemes under Favoritism and Influence

With the model basics specified above, let us first examine the effect of favoritism and influence on incentive provision in a simple 2-period context.

Let both the employees and the manager live for 2 periods and there be no discounting. At the beginning of the first period, the firm commits to the manager’s compensation, the number and the size of employee’s performance reward. In the first period, the manager privately observes employee’s performance and determines the set of employees to receive the performance reward. The performance reward is then distributed at the beginning of the second period.
Incentives under Monetary Reward

Depending on whether the distribution of reward has any effect on the team’s expected future output, performance rewards can be divided into two types. In the first type, rewards have distributional consequences only, with bonus payments being the most common example. We shall refer to such type of reward as the “monetary reward”.

With monetary reward, the team’s output in the second period is unrelated to the distribution of rewards. At the end of the first period, the manager chooses the set of reward winning employees to maximize his own expected second period utility. The maximization problem of the manager is:

$$\max_B \sum \theta E(y_{j2}) + w + \sum_{j \in B} E(f_{j2})$$

$$\Leftrightarrow \max_B \sum_{j \in B} E(f_{j2})$$

It is then easy to see that, under the monetary reward scheme, the manager’s maximization problem reduces to the maximization of the utility derived from favoritism. As the distribution of rewards has no effect on the second period output, thus the manager’s compensation, the manager will choose the set of employees to be promoted based on his personal preference only.

Result 1. Under the monetary reward scheme, the manager chooses the set of employees to be rewarded based on his personal preference only. Employee exert positive effort in influence activities and zero effort in productive activities.
Incentives under Promotion-Based Reward

With the second type of reward, who gets the reward does not only have distributional consequences but also affects future production of the team. The most common example is promotion, in which the recipient of higher wage is accompanied with re-assignment of the employee’s job. We shall refer to this type of reward scheme as the “promotion-based reward”.

Let there be 2 job levels, and the expected output of employees for the higher and lower level be \( E(y_{j}^H) = \rho^H a_j + e_j + b_H \) and \( E(y_{j}^L) = \rho^L a_j + e_j + b_L \) respectively. We assume \( \rho^H > \rho^L \), that high ability workers are more suited for the higher position, and \( E(y_{j}^L|a_0) > E(y_{j}^H|a_0) \), that employees are better suited for the lower position when they enter the firm.

After observing an employee’s performance, the manager learns about the ability and update the expected output of the employee in both level of jobs. Given the linear form of \( \eta_{jt} \) and the normality of \( a_j \) and \( \epsilon_{jt} \), the manager’s learning follows the normal updating rule:

\[
E(a_j|\eta_{j1}) = \frac{h_0}{h_0 + h_\epsilon} a_0 + \frac{h_\epsilon}{h_0 + h_\epsilon} (\eta_{j1} - \epsilon_{j1}^*),
\]

where \( h_0 = \frac{1}{\sigma_0^2} \) and \( h_0 = \frac{1}{\sigma_\epsilon^2} \).

Let \( \beta_1 = \frac{h_\epsilon}{h_0 + h_\epsilon} \), we can rewrite (3.7) as:

\[
E(a_j|\eta_{j1}) = (1 - \beta_1) a_0 + \beta_1 (\eta_{j1} - \epsilon_{j1}^*).
\]

We can see from (3.8) that better first period performance increases the manager’s belief about an employee’s ability, which in turn increase the manager’s belief about the employee’s suitability for the higher level job. The manager’s maximization problem under the promotion-based reward scheme is:
\[
\max_B \theta \sum_j E(y_{j2}) + w + \sum_{j \in B_1} E(f_{j2})
\]

\[
\Leftrightarrow \max_B \theta \sum_j E(y_{j2}^L) + \theta \sum_{j \in B} E(y_{j2}^H) - E(y_{j2}^L) + \sum_{j \in B} E(f_{j2})
\]

\[
\Leftrightarrow \max_B \sum_{j \in B} \theta (\rho^H - \rho^L) \beta_1 \eta_{j1} + f_{j1}
\]

\[
\Leftrightarrow \max_B \sum_{j \in B} \theta (\rho^H - \rho^L) \beta_1 \eta_{j1} + f_{j1} \tag{3.9}
\]

We can see from (3.9) that, the manager’s utility maximization problem can be expressed as the maximization of a weighted combination of the employee’s performance and the manager’s personal preference term.

**Result 2.** *Under the promotion-based reward scheme, the manager chooses the set of employees to be rewarded based on both the employee’s performance and his personal preference towards the employee.*

Let \(p(e_{j1}, i_{j1})\) be the probability of being promoted as a function of the employee’s effort. Given the manager’s decision rule, it is obvious from that \(p(e_{j1}, i_{j1})\) is increasing in both \(e_{j1}\) and \(i_{j1}\). Substituting the expression of \(\eta_{jit}\) and \(f_{jit}\) into (3.9), we can derive that:

\[
p(e_{j1}, i_{j1}) = G(\theta (\rho^H - \rho^L) \beta_1 e_{j1} + i_{j1}), \tag{3.10}
\]

where \(G\) is a cumulative density function jointly determined by the distribution of \(a_j, \epsilon_{jt}\) and \(f_{j0}\).

The maximization problem of the employees is then:
\[
\max_{e_{j1}, i_{j1}} p(e_{j1}, i_{j1}) R - c(e_{j1}, i_{j1})
\] (3.11)

Given (3.10) and (3.11), it is easy to derive from the first order condition that:

\[
\frac{\partial c}{\partial e_{j1}} / \frac{\partial c}{\partial i_{j1}} = \theta (\rho^H - \rho^L) \beta_1
\] (3.12)

**Result 3.** Employees exert positive effort in both productive and influence activities under the promotion-based reward scheme. The relative level of effort spend on the productive activities compared to influence activities increases with the manager’s compensation sensitivity to output \(\theta\), the productivity difference parameter \((\rho^H - \rho^L)\), and the learning update parameter \(\beta_1\).

**The Firm’s Optimal Reward Scheme**

Given the choice rules of the manager and the employees, the firm sets the manager’s compensation and the reward scheme to maximize the expected joint surplus.

**Proposition 1.** Under favoritism and influence, the firm chooses the promotion-based reward scheme over the monetary reward scheme to provide employee effort. Employee exert effort in both productive and influence activities. Under the firm’s optimal reward scheme, the level of productive effort induced is lower than the first-best.

With Results 1-3 in previous analysis, the derivation of Proposition 1 is straightforward. When managers are subject to favoritism and influence, the promotion-based reward scheme is preferred over the monetary reward scheme as assignment efficiency provides managers the implicit incentive to limit their
practice of favoritism. However, as favoritism and influence activities are still present, the optimal productive effort induced is lower than the first best.

Note that the uncertainty and learning about an employee’s ability plays an important role in creating the implicit incentive to limit favoritism. The manager cares about an employee’s performance only because it changes his assessment of the employee’s ability. When there are more periods, the learning process completes over time, which may well affect the effectiveness of the promotion-based scheme. In the next subsection, we shall extend the model to more periods and examine the dynamics of incentive provision under the promotion-based reward scheme.

3.3 Dynamics of Employee Effort

Now, let both the employees and the manager live for $T$ periods and the discounting factor be $\delta$. At the beginning of the first period, the firm commits to the wage profiles and the number of employees to promoted in each period. In each period, the manager privately observes employee’s performance and determines the set of employees to be promoted. Once promoted, employees stay in the higher level.

Let $P_n$ be the set of employees to be promoted at the end of period $n$. The manager’s maximization problem at the end of period $n$ is now:

$$
\max_{P_n} \sum_{j \in P_n} \sum_{s=n+1}^{T} \delta^{s-n}[E(y_{js}^H) - E(y_{js}^L) + E(f_{js})]
$$

$$
\Leftrightarrow \max_{P_n} \sum_{j \in P_n} E(y_{j,n+1}^H) - E(y_{j,n+1}^L) + E(f_{j,n+1})
$$

$$
\Leftrightarrow \max_{P_n} \sum_{j \in P_n} \theta(\rho^H - \rho^L)E(a_j|\eta_j^n) + f_{j,n}
$$
\[
\sum_{j \in P_n} \sum_{s=1}^{n} \eta_{js} + f_{jn}, \quad (3.13)
\]

where \( \beta_n = \frac{h}{\text{m} + nh} \).

Let \( p_n(e^n_j, i^n_j) \) be the probability of an employee being promoted at the end of period \( n \), given his effort history \( e^n_j \) and \( i^n_j \). Substituting the expression of \( \eta_{js} \) and \( f_{jn} \) into (3.13), we have:

\[
\frac{\partial p_n}{\partial e_{js}} \frac{\partial p_n}{\partial i_{js}} = \theta (\rho^H - \rho^L) \beta_n \forall s \leq n. \quad (3.14)
\]

Let \( V_n \) and \( V^p_n \) be the present value of an employee working at the lower and higher level in period \( n \). We can express employee \( j \)'s present value in period \( n \) recursively as:

\[
V_n(e^n_j, i^n_j) = w^L_n + \delta [p_n(e^n_j, i^n_j)V^p_{n+1} + (1 - p_n(e^n_j, i^n_j))V_{n+1}(e^n_j, i^n_j)] \quad (3.15)
\]

The employee’s maximization problem in period \( n \) is then:

\[
\max V(e^n_j, i^n_j) - c(e_{jn}, i_{jn}). \quad (3.16)
\]

**Lemma.** In the T-period model, employee’s effort choices in period \( n \) satisfies the following condition:

\[
\frac{\partial c}{\partial e_{jn}} / \frac{\partial c}{\partial i_{jn}} < \frac{\partial c}{\partial e_{jn'}} / \frac{\partial c}{\partial i_{jn'}} \forall n' < n \leq T.
\]

Given the maximization problem derived in (3.16), the result in the above lemma follows directly from the first order condition of (3.16). What the lemma states is that, the relative level of effort employees put on productive activities compared to influence activities decreases as they stay in the same position for
longer. With this result, we are ready to derive the general characterization of equilibrium employee effort under our model.

**Proposition 2.** Let the \( e^*_j \) be employee's effort choice under the firm's optimal promotion-based incentive scheme and \( e^E \) be the first-best employee effort. Then, the following hold:

1) \( e^*_j < e^E \) \( \forall n \);
2) \( e^*_j < e^*_j' \) if \( n > n' \);
3) \( e^*_n \to 0 \) as \( n \to \infty \).

Proposition states that, not only are effort levels lower than the first best under favoritism and influence, the distortion away from the first best gets worse as employee’s position specific tenure increases. What’s more, if an employee stays in the same position for a very long time, he would almost devote all his effort in influence rather than productive activities, resulting the firm choosing to induce very little effort from him.

### 3.4 Implications of Favoritism and Influence

In our analysis above, we showed that the promotion-based scheme is preferred to monetary reward scheme and that employee’s productive effort decreases as they stay longer in the same position. Note that these results are derived under the simplifying assumption that there exist no external force that disciplines the manager’s practice of favoritism, be it the possible punishment from the firm or its negative effect on the manager’s reputation. In this section, we would like to discuss the implication of favoritism and influence on incentive design and employee effort in a more general context where objective performance measures and monitoring on subjective evaluations are allowed to exist.

Consider a firm in which tasks to be performed at each job are complex and multidimensional. Let \((t_1, t_2, ..., t_n)\) be the set of tasks relevant for production,
\( \vec{e} = (e_1, e_2, \ldots, e_n) \) be the vector of efforts spent in the set of tasks. Let \( f(\vec{e}) = \vec{\alpha} \cdot \vec{e} = \alpha_1 e_1 + \alpha_2 e_2 + \ldots + \alpha_n e_n \) be the value of output produced as a function of the efforts.

Let there exist a contactable performance measure \( m(\vec{e}) = \vec{\beta} \cdot \vec{e} \). The contactable measure is imperfect in the sense that there exist no multiplier \( r \) such that \( r \vec{\beta} = \vec{\alpha} \). The most common example of imperfection is that \( \beta_x = 0 \) for some \( x \), which means some aspect of the tasks to be performed is not covered by the contactable measure.

On the other hand, subjective evaluations can be formed over any specific task \( t_x \). We denote the subjective evaluation of task \( x \) by \( s_x(\vec{e}) = \psi_x e_x \).

**Incentive Provision under No Favoritism and Influence**

When managers are not subject to favoritism and are expected to carry out performance evaluations honestly, the firm can base their incentive scheme on subjective evaluations without any additional cost. In such case, subjective evaluations can be used as if they are objective measures.

It is then easy to see that it is possible to construct a perfect measure of performance based on subjective evaluations by choosing appropriate weight on each \( s_x \) according to \( \vec{\alpha} \). When there exist no favoritism and influence, imperfection in objective measures posts no constraint on the incentive provision for employees. The problem of incentive provision goes back to the classical insurance-incentive tradeoff and first best effort can be achieved if employees are risk neutral.

**Incentive Provision under Favoritism and Influence**

In the presence of favoritism and influence, use of subjective evaluations carries the associated cost of influence activities. Influence costs associated with promotion-based incentives may be lower than that associated with monetary
incentives, depending on the employee’s position-specific seniority and how well external punishment mechanism such as reputation works. However, monetary incentive is more flexible as it can be based the firm’s choice on any combination of $s_x$. Objective measures, although may not be perfect, is not susceptible to the problem of favoritism and influence cost.

As a result, the firm’s optimal incentive scheme may be a combination of monetary reward based on objective measures, monetary reward based on subjective evaluations and reward associated with promotion.

Note that, for monetary reward based on objective and subjective measures of performance, there is no obvious reason why the their effectiveness should change over time. On the other hand, effectiveness of promotion-based reward decreases with employee’s position specific seniority as established in section 3.3.

**Proposition 3.** *When managers are not subject to favoritism and influence, the effort of employees under the firm’s optimal incentive scheme does not vary with employee’s position-specific seniority. When managers are subject to favoritism and influence, if there exist some aspect of effort $e_x$ that is better induced through promotion compared to other options, $e_x$ decreases as the employee’s position specific seniority increases.*

Proposition 3 states that, even under relaxed assumptions about the firm’s available incentive instruments, the existence of favoritism and influence would result in decreasing employee effort with position specific seniority as long as there is some aspect of employee’s performance that is either not well measured or not easily observable to other employees for the reputation mechanism to work.
4 Conclusion

Economic literature has traditionally studied too little about the incentive provision of the group of employees whose output are hard to measure and subjective evaluated by managers. With 20 years of personnel data from a large firm, we show that employee effort are not optimized in the way that classical incentive theories would predict. With the insight from our empirical work, we set out to explain in theory why would the firm’s optimization of employee effort be constrained in such a way that produces the pattern of employee effort we observe in the data. We show with an enriched principle-manager-employee framework that real life complications such favoritism and influence could result in decreasing equilibrium effort with seniority even after the firm has optimized its incentive schemes.

The empirical observation that an employee’s effort decreases as he stays in the same position for longer and the theoretical result that such decreasing effort could be more than just poor incentive management but a result of real life constraints has several important implications. First, in contrast to most human capital theories, decreasing effort means that it is possible for an employee’s productivity to decrease as he stays longer in his position. Second, if employee’s effort decreases as position-specific tenure increases, firms would face higher pressure to promote an employees with higher position-specific seniority. This gives a rational explanation of why seniority is usually taken into account in promotion decisions. Third, decreasing effort with position specific seniority points to the importance of designing career paths with appropriate step lengths. Shorter expected years to progress to the next level is preferred to longer expected years, as the cost of decreasing effort becomes larger as employees stay longer in the same position.
References


