

Does Reputation Management on Social Media Boost Career? Evidence from the Market for Executives

Completed Research Paper

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Abstract

Our paper studies the impact of reputation management (RM) on executives' career using their usage of Twitter. This self-promoting behavior has an influence on the bargaining powers in negotiating compensation and sorting during the hiring process, which increases their job acquisition chances. Our structural model which is based on a two sided matching model, is able to separately identify the two influences. We modeled the matching and the pay as endogenously determined. We find both effects to be significant. While RM only increases the compensations of successful candidates, in the recruiting process of CEO and CMO markets, both outstanding and outperformed applicants benefit from it. Our analysis sheds light upon the pricing scheme of social media for the use of self-promotion.

Keywords: Reputation management, executive labor market, two-sided matching, Gibbs sampling

Introduction

Reputation management (abbreviated to RM) helps executives receive more attention, increase their reputation, and enhance their overall career outcome. For example, recent literature reveals that media visibility, one of the used RM methods, is positively correlated with an executive's job acquisition and payment premiums. However, the research has been almost silent about how RM influences the job market matching mechanism and compensation contracts. To bridge this gap in information, we model the perceived competence of an executive as a result of both natural honor bestowed for operating performance and strategic self-promotion. We examine whether executives are born from operating performance or through the process of RM.

Self-promotion as one of the primary methods to manage an executive's reputation can have both positive and negative outcomes. For example, listing one's achievements and recognitions could serve as a tool for verifying competency in view of a potential employer. Additionally, RM on social media may prove that the candidate is able to embrace current social trends by demonstrating the management of self-branding using recent and new technology. There is recent evidence suggesting that a candidate who avoids self-

promotion of skills or achievements, may be interpreted as negatively in some structures of interaction, see Pfeffer, Fong, Cialdini, and Portnoy 2006 or Page 129 in Kenrick, Neuberg, and Cialdini 2005. In contrast, RM may also increase the possibility of appearing self-aggrandizing or narcissistic, (Buffardi and Campbell 2008) and in turn, arouse feelings of dislike (Baumeister and Ilko 1995). Further, the managing of social media can also be time-consuming and distracting to a person's duties or responsibilities and as a result may cause implications in work-related environments. Our research seeks to answer whom self-promotion is ideal for and what the impact it has on the candidate. We extend the labor market matching model of Kelso Jr and Crawford (1982) to incorporate the Self-Promotion of candidates before matching.

Building on attribution theory, a person either attributes approving circumstances to internal causes or less desirable ones to external causes. Executives are given incentive to adjust their behavior according to such attributions in order to heighten public perceptions of the correlation between good performance and abilities and vice versa. Prior research finds a clear pattern that managers are more likely to attribute good news to internal causes and explain bad ones using the "Dog ate my homework" excuse (Staw, McKechnie, and Puffer 1983; Salancik and Meindl 1984; Baginski, Hassell, and Kimbrough 2004).

Executives' personal Twitter accounts provide us with a clear format to study corporate self-promotion. The pioneering research on the executive labor market uses media coverage but it can be viewed as less reliable since it ignores the link that strategic disclosure by executives can influence media coverage as stated in Blankespoor and DeHaan (2015). In the realm of public media, executives are able to influence the press and either encourage or discourage the use of their name from appearing. To better address executive self-promotion, Blankespoor and DeHaan (2015) use whether an executive provides a direct quote in a firm-initiated press releases together with the informativeness and vividness of the quote. Although executives have more discretion over their comments, the published speech may still be largely left up to by the firm's decision in a group initiated press release. However, a private social broadcasting account is under the sole control of the executive. Twitter, a concise and user-friendly broadcasting system, has served as an ideal platform for RM. It provides us with a clear source of information in comparison to the previously mentioned media coverage and direct quotes in firm-initiated press releases.

The theoretical challenge in assessing the impact of RM on an executive's career is two-fold. For example, the recruiting process of a candidate is a mutual decision problem. Firms more often than that, prefer the most talented candidates among a pool of applicants. Similarly, a candidate will choose to join the most suitable company among all the offers that are extended. The more competent a candidate is, the more likely s/he will end up with a desired employer. As a result, the characteristics of the employer and employee will be strongly correlated. Among all the characteristics of executives, those that are unobservable to econometricians, are represented by error terms. These traits are positively correlated with the company's characteristics in the sorting process. This positive correlation overstates the estimates relative to the actual effect. Similarly, the unobserved qualities of employers inflate the estimates of employee characteristics in a regression framework. In addition, the exclusivity of mutual decisions makes most of the discrete choice models not applicable. For example, the sorting during the hiring process of executives, subjects both parties to the many-to-one matching framework, meaning each candidate may only work for one company. Each company hires one (or in some cases, several) executives. For example, in the CEO market, a candidate evaluates each opportunity and accepts the best one according to preference. This decision omits other candidates from becoming CEO of the same company. It is because of this reason that Heckman's selection model (Heckman 1979) is not a viable option for reference. Besides, the competitions within companies and candidates may lead to a substitution pattern that depends on all available choices. The relative odds between the two options considered will be affected by the introduction or modification of a third option. This contradicts the Independence of the Irrelevant Alternatives (IIA) Property. Therefore, the multi-nominal probit and logit random utility models are not applicable.

The second challenge is firm-executive assignments and the distribution of compensation across the set of applicants are inherently jointly determined and thus, both are endogenous. A more capable candidate has a higher bargaining power in compensation negotiation. Furthermore, the executives with higher unobserved quality, tend to gain a better salary. With the endogeneity problem, factors of candidates do not earn their marginal rewards since in equilibrium she could move to a preferable company.

Unfortunately, the task of finding an instrumental variable to solve the endogeneity problem is not a straightforward one. The economics underlying the executive labor market make it hard to find a variable that is independent of the bargaining power while still relative to the quality of a candidate.

To overcome the problem of missing instruments, we have developed a structural model that exploits the differences between compensation negotiations and recruiting process, in order to separately identify the two influences of RM. Sorting that implies an executive candidate's decision is dependent on the characteristics of all others in the market. In other words, a candidate may be less considered and left with fewer options if there are more capable candidates in the applicant pool. Despite this, compensation is a contract specific feature to a particular executive and firm. Therefore, compensation is independent of other candidates' characteristics. This exogenous variation provided by other candidates in the set of applicants across markets helps us to solve the endogenous problem, which is very similar to Berry, Levinsohn, and Pakes (1995).

Our structural model includes two parts, the first of which, being the recruiting stage. We model the latent utility of both sides of the market when choosing each other, as it is an extension of the two-sided matching model of Gale and Shapley 1962; Hatfield and Milgrom 2005; Roth and Sotomayor 1992, for which equilibrium matching always exists. According to the practice of the executive market, it is more common that firms initiate a job search. The equilibrium is optimal and strategy-proof for the company, as is proven in Hatfield and Milgrom (2005). That is reporting the true preference is a dominant strategy. The recruiting stage controls the sorting and selection of observable employment records and allows for the interactions among the choices of agents. As previously mentioned, the second half of the structural model is compensation negotiation. With the help of the recruiting process, it is possible to gather consistent estimates in the compensation negotiation process. We jointly estimate that the two parts of our model help to eliminate bias due to the endogeneity problem.

Being the first empirical study on two-sided matching model in Information System area, we develop a structural model using Bayesian estimation. Estimation is numerically intensive because the endogeneity that causes the choices depends on all other agents. As a result, the likelihood is an integral which cannot be factored into a product of lower-dimensional integrals. However, Bayesian estimation using Gibbs sampling transforms the high dimensional integral problem into a simulation problem and makes the estimation feasible. With the help of Bayesian estimation with data augmentation, we can empirically test agent's preferences which are taken as inputs in theoretical matching literature.

This paper contributes to the literature by being the first to directly estimate how RM affects the executive labor market. Our model based on two-sided matching model provides substantial evidence for the market design of executive labor market. We add to the literature of matching theory that considers people's invest before matching. Our model also incorporates the post-matching bargaining which has been largely ignored in the matching theory. Our research stands apart from the two-sided matching models by allowing uncertainty in payment and relaxing the assumption that the payment is common knowledge to the decision makers. Another narrower contribution to the literature is finding a clean and direct measure of RM.

Our study has several managerial applications. Firstly, it paves the way for a more efficient RM practice. Secondly, the significant monetary benefits by RM on social media points out a potential business model for social media companies such as Twitter. Surprisingly, Twitter is currently providing its service for self-promotion customers for free. Our results identify a new source of revenue for these businesses.

Executive Market Background and Literature Review

Executive Labor Market Background

In the executive labor market, it is usually the firms which have openings that take the first move. This is because reaching out to new alternatives, if fails, could have put executives at risk with their current employer, despite that they try hard to do it confidentially. This feature differentiates executive level market from entry level markets such as medical residency market and college admission. Yet, most of the executives are open to new possibilities. In addition, many senior positions are not advertised, but placed

by executive search firms. The hiring process usually starts with executives receiving phone calls from recruiters. There are two types of recruiters-executive search firms and corporate recruiters. Executive searching is a well-developed industry. These companies work for the recruiting firm, analyze their needs, generate a short list and approach potential candidates subtly. Some executive search firms form an association and share candidate database, for example, AESC (Association of Executive Search and Leadership Consultants).

According to the Candidate's Bill of Rights of AESC, once the hiring company picked the candidate, the two parties have arrived at the negotiation process, which concludes the search. In the last step before closing the deal, they will bargain over base salary, performance bonus, stocks, and options, etc.

Literature Review

This paper lies at the intersection of Self-presentation, matching theory of matching models and executive compensation.

Individual reputation management or self-presentation in psychology literature defines the behavior that one attempts to shape her images or reputation to the audience by her statement. Individual strategically present themselves to establish a desirable identity and remedy an impaired one (Bolino, Kacmar, Turnley, and Gilstrap 2008; Drory and Zaidman 2007). One major goal for individual reputation management is to boost career. Roberts (2005) suggests that individuals carefully manage their impression using tactics such as self-promotion, seeking to shape the way others view them into their desired professional image. Laboratory experiment shows self-promotion enhances one's chance in an interview since it is strongly related to the perception of person-job fit (Kristof-Brown, Barrick, and Franke 2002). Morgeson, Delaney-Klinger, Mayfield, Ferrara, and Campion (2004) find job incumbents inflate the required abilities to the position in job analysis, which affects the HR systems (such as performance appraisals or compensation systems) using a field experiment. Similarly, Hambrick, Finkelstein, and Mooney (2005) examine the executives and find them creating the illusion that their jobs are more highly demanding. Our paper investigates reputation management using executives' posts and conversations on Twitter on a daily basis, which is beyond laboratory setting or a one-shot field experiment. By bringing the theories in self-presentation to social media age, we can conduct our research using direct observations rather than lab experiment data or surveys.

Matching theory models the equilibrium of assignment of two groups. They take the payoffs or utilities for all possible assignments and produces a set of stable matching in which no agents prefer to deviate. This equilibrium concept widely used in matching theory is pair-wise stability. The key economic feature is the rivalry to match with the most desirable agent. Earlier works in matching and mechanism design often examines only the market clearing stage, taking agents' types as predetermined inputs (Hatfield and Milgrom 2005; Roth and Sotomayor 1992; Kelso Jr and Crawford 1982, Sorensen 2007). Our model builds on these models to offer substantially more details about how the executive labor market clears with RM and prices RM, which is an investment agent made before the matching runs. Hatfield, Kojima, and Kominers (2015, 2014) further investigate the case when people can invest in their human capital in order to achieve a more desirable matching outcome. Our model aligns with the idea that choosing an effort of RM is a special investment of human capital which can influence the matching outcome. However, our model stands apart from these studies by considering post-matching negotiation which is the typical case in the executive labor market.

Among all the influence factors on executive compensation, performance attracts the most attention from researchers (e.g. Jensen and Murphy 1990 and Hall and Liebman 1998). Evidence shows the executive pay-performance sensitivity is increasing across years. For example, using a recent dataset, the performance sensitivity Hall and Liebman documented is four times higher than in Jensen and Murphy 1990. Governance influence affects compensation partially through performance sensitivity. For example, Conyon and Peck 1998 examined the role of governance structures on the pay-performance relationship and found boards with a higher percentage of outside directors tend to design a highly performance driven compensation plan. However, performance contingent compensation becomes less efficient with high uncertainty. As a result, executive compensation varies according to firm risk as well (Miller et al. 2002). Besides, although performance attracts researchers' attention the most, it is less important in explaining variance in total CEO compensation comparing to firm size (Tosi et al. 2000).

Structural Empirical Model

Two-Sided Matching Model

Recruiting requires the consent of both the candidates and the company. Agents rival with each other to match to their dream partner. We use a two-sided matching model to capture this mutual decision and address the endogeneity problem resulting from the sorting in matching. This model is a static equilibrium model from cooperative game theory. For any firm $i \in I_m$ and $j \in J_m$, where $m = 1, 2 \dots M$ is the market index, we model the utility functions for both two sides U_{ij}^F and U_{ij}^E . A matching is a collection of employment records, $(i, j) \in \mu_m$. Firm i 's employees in market m are $\mu_m(i)$. We denote executive j 's employer as $\mu_m(j)$.

Equilibrium. Roth and Sotomayor (1992) proved, in our model a matching always exists and is group stable if and only if it is pair-wise stable. By further assume firms initiate the matching process, the equilibrium of our model is unique and firm-optimal. The equilibrium concept we use in our two-sided matching model is pairwise stability.

Proposition. A matching μ_m is stable if and only if the following inequality holds. μ_m^e denotes the equilibrium matching in market m .

$$\begin{aligned} \mu_m = \mu_m^e \Leftrightarrow & U_{ij}^F < \overline{U_{ij}^F} \text{ and } U_{ij}^E < \overline{U_{ij}^E}, \forall (i, j) \notin \mu_m \\ & U_{ij}^F > \underline{U_{ij}^F} \text{ and } U_{ij}^E > \underline{U_{ij}^E}, \forall (i, j) \in \mu_m \end{aligned} \quad (1)$$

The main idea of the proposition is: For an unmatched pair (i, j) , the deviation from equilibrium is when firm i is willing to hire executive j instead, and j is happy to job hopping. In another case, for a matched pair (i, j) , any agent's deviation will break the equilibrium.

For any matched pair (i, j) , any agent's deviation will break the equilibrium. Let $f(i)$ be a set of all executives who are not currently working for firm i but would see it as a better choice. $f(j)$ is a set of all possible firms that executive j can switch to. These firms evaluate j as a more attractive employee than their worst incumbent ones. The equilibrium fails if at least one of the following inequalities holds: (1) If firm i could employ a better executive j' from all of the candidates who prefer to have joined firm i :

$$U_{i,j}^F < \max_{j' \in f(i)} U_{i,j'}^F, \quad (2) \text{ If executive } j \text{ prefers to work for a more desirable and feasible firm } i' :$$

$$U_{i,j}^E < \max_{i' \in f(j)} U_{i',j}^E.$$

We define $\underline{U_{ij}^F}$ and $\underline{U_{ij}^E}$ as follows:

$$\underline{U_{ij}^E} = \max_{i' \in f(j)} U_{i',j}^E, \quad \underline{U_{ij}^F} = \max_{j' \in f(i)} U_{i,j'}^F. \quad (2)$$

Therefore, neither executive j nor firm i will block the pair if and only if $U_{ij}^E > \underline{U_{ij}^E}$ and $U_{ij}^F > \underline{U_{ij}^F}$.

For any unmatched pair (i, j) , the deviation from the equilibrium is when firm i is willing to hire executive j instead of its current worst employee in the same position, and j is better off by joining i .

This can be translated to: $U_{ij}^F > \min(U_{i,\mu_m(i)}^F)$ and $U_{ij}^E > U_{\mu_m(j),j}^E$. Therefore, (i, j) is not a blocking pair if and only if $U_{ij}^F < \min(U_{i,\mu_m(i)}^F)$ or $U_{ij}^E < U_{\mu_m(j),j}^E$. For convenience, we define the $\overline{U_{ij}^E}$ and $\overline{U_{ij}^F}$ as follows:

$$\begin{aligned} \overline{U}_{ij}^E &= \begin{cases} U_{\mu_m(j),j}^E, & \text{if } U_{ij}^F > \min(U_{i,\mu_m(i)}^F) \\ +\infty & \text{otherwise} \end{cases} \\ \overline{U}_{ij}^F &= \begin{cases} \min(U_{i,\mu_m(i)}^F), & \text{if } U_{ij}^E > U_{\mu_m(j),j}^E \\ +\infty & \text{otherwise.} \end{cases} \end{aligned} \quad (3)$$

So equivalently, (i,j) is not a blocking pair if and only if $U_{ij}^E < \overline{U}_{ij}^E$ and $U_{ij}^F < \overline{U}_{ij}^F$.

Model

For executive applicant j, her utility U_{ij}^E of working for firm i depends on the firm characteristics F_i and her interaction with the firm A_{ij} :

$$U_{ij}^E = F_i^T \cdot \beta_{ind(j),1} + A_{ij}^T \cdot \beta_{ind(j),2} + \eta_{ij} \equiv x_{ij}^{F,T} \cdot \beta_{ind(j)} + \eta_{ij} \quad (4)$$

Where $\eta_{ij} \sim N(0, \sigma_\eta^2)$, $\beta_{ind(j)} \sim N(\mu_\beta, \Sigma_\beta)$ captures heterogeneity preference in different industry sectors according to the where the candidate is applying. The error term η_{ij} contains unobserved factors of a firm's utility. A_{ij} describes the attachment of candidate j and firm i as whether candidate j is an incumbent executive from the last period. Note that, this utility function is robust to firm fundamentals, such as positive/negative events of the firm since it is the same for every applicant of the firm and thus firm characteristics is irrelevant from the sorting of executives. Similarly, firm specific searching costs are also compatible with our utility model.

Likewise, firm i's willingness of recruiting candidate j depends on j's characteristics E_j and their interaction A_{ij} :

$$U_{ij}^F = E_j^T \cdot \gamma_{pos(i),1} + A_{ij}^T \cdot \gamma_{pos(i),2} + \delta_{ij} \equiv x_{ij}^{E,T} \cdot \gamma_{pos(i)} + \delta_{ij} \quad (5)$$

Where $\delta_{ij} \sim N(0, \sigma_\delta^2)$, $\gamma_{pos(i)} \sim N(\mu_\gamma, \Sigma_\gamma)$ captures heterogeneity preference in different positions the firms are recruiting for. The error term δ_{ij} contains unobserved factors of a candidate's utility.

The proposition imposes the upper/lower bound of the utilities according to whether $(i, j) \in \mu_m$ or not. As a result, the matching outcome depends on all the candidates and firms. Variation in the set of participants across different markets provides exogenous variation in assignment. It solves the endogeneity problem in the same way as the traditional instrumental variable method.

If firm i and executive candidate j express mutual interest to form a pair, the two players will negotiate the compensation based on the observed characteristics of both sides and their interactions. Contrast to the recruiting process, the bargaining is between a certain candidate and a firm, and independent of other candidate's attributes. So we characterize the compensation negotiation process as:

$$r_{ij} = \alpha_0 + F_i^T \cdot \alpha_1 + E_j^T \cdot \alpha_2 + A_{ij}^T \cdot \alpha_3 + \varepsilon_{ij} \equiv w_{ij}^T \cdot \alpha + \varepsilon_{ij} \quad (6)$$

Where $\varepsilon_{ij} \sim N(0, \sigma_\varepsilon^2)$, r_{ij} is the compensation we observe, all other covariates are defined as in (4) and (5).

Since the unobserved factors of executive and firm utilities affect both the ranking in the sorting and bargaining power, we model the covariance between the error terms and decomposed the error term in the compensation negotiation process into orthogonal terms as

$$\varepsilon_{ij} = \kappa \cdot \eta_{ij} + \lambda \cdot \delta_{ij} + \nu_{ij} . \quad (7)$$

We set $\sigma_\delta^2, \sigma_\eta^2$ to be 1 to fix the scales and exclude constant terms to fix the levels. Thus the joint distribution of η_{ij}, δ_{ij} and ν_{ij} is

$$\begin{pmatrix} \varepsilon_{ij} \\ \eta_{ij} \\ \delta_{ij} \end{pmatrix} \sim \begin{pmatrix} \kappa^2 + \lambda^2 + 1 & \kappa & \lambda \\ \kappa & 1 & 0 \\ \lambda & 0 & 1 \end{pmatrix} . \quad (8)$$

Based on the data generation process, the augmented posterior density is

$$\begin{aligned} p(U^F, U^E, \gamma, \beta, \theta | W, r, \mu) &= \phi_0(\theta) \cdot \prod_m \{ [\prod_{(i,j) \in \mu_m} \phi((r_{ij} - w_{ij}^T \cdot \alpha - \kappa \cdot (U_{ij}^E - x_{ij}^{F,T} \cdot \beta_{ind(j)})) \\ &- \lambda \cdot (U_{ij}^F - x_{ij}^{E,T} \cdot \gamma_{pos(i)})) / \sigma_v) \cdot 1(U_{ij}^E > \underline{U}_{ij}^E) \cdot \phi(U_{ij}^E - x_{ij}^{F,T} \cdot \beta_{ind(j)}) \cdot 1(U_{ij}^F > \underline{U}_{ij}^F) \cdot \phi(U_{ij}^F - x_{ij}^{E,T} \cdot \gamma_{pos(i)})] \cdot \\ &[\prod_{(i,j) \notin \mu_m} 1(U_{ij}^E < \overline{U}_{ij}^E) \cdot \phi(U_{ij}^E - x_{ij}^{F,T} \cdot \beta_{ind(j)}) \cdot 1(U_{ij}^F < \overline{U}_{ij}^F) \cdot \phi(U_{ij}^F - x_{ij}^{E,T} \cdot \gamma_{pos(i)})] \} . \end{aligned} \quad (9)$$

Here θ stands for the parameters we need to estimate: $(\alpha, \mu_\beta, \Sigma_\beta, \mu_\gamma, \Sigma_\gamma, \kappa, \lambda, \sigma_v^2)$. We use μ_m to denote observed firm-executive matching pair in market m . U^F, U^E, W, r, μ contain all $U_{ij}^F, U_{ij}^E, w_{ij}, r_{ij}, \mu_m$ in all markets. $1(\cdot)$ is the indicator function.

Structural Identification

The computational challenge arises from sorting and interaction between agents in both sides of the markets. When an executive signs a contract with a firm, it will prohibit or greatly reduce the probability that other candidates can take the same position, due to the quota of each company. So we cannot analyze each candidate's decision independently. As a result, the likelihood cannot factor into a product over the individual choice likelihood, which are lower-dimensional integrals. Rather, this fundamental property of our research question requires all error terms to be integrated simultaneously. The maximum likelihood function will suffer from the curse of dimensionality and is impossible for estimation. However, Bayesian estimation using Gibbs sampling and data augmentation transforms this high dimensional integration problem into a simulation problem and makes estimation feasible.

The prior distributions of $(\alpha, \mu_\beta, \Sigma_\beta, \mu_\gamma, \Sigma_\gamma, \kappa, \lambda, \sigma_v^2)$ are $N(\mu_\alpha, \Sigma_\alpha)$, $N(\mu_{\mu_\beta}, \Sigma_{\mu_\beta})$, $InvG(a_\beta, b_\beta)$, $N(\mu_{\mu_\gamma}, \Sigma_{\mu_\gamma})$, $InvG(a_\gamma, b_\gamma)$, $N(\mu_\kappa, \Sigma_\kappa)$ and $\sigma_v^2 \sim InvG(a, b)$ respectively. $\Sigma_{\beta,k}$ and $\Sigma_{\gamma,k}$ denote the k -th element of Σ_β and Σ_γ .

In the estimation procedure, the prior distributions have means of zero and variances of 100. The parameters of inverse gamma distribution are set to be 0.01, which is an uninformative prior. For most of estimated parameters, the prior variances are more than 100 times greater than the posterior variances. This suggests the posterior distribution reflects the information from data well.

Sampling procedures of Latent Utilities

The conditional augmented posterior distribution of U_{ij}^F and U_{ij}^E vary according to whether firm i and executive candidate j are matched or not. When $(i, j) \notin \mu_m$, the densities are simply:

$$p(U_{ij}^E | X_{ij}^F, U_{-ij}^E, U^F, \beta_{ind(j)}) = 1(U_{ij}^E < \overline{U_{ij}^E}) \cdot \phi(U_{ij}^E - X_{ij}^{F,T} \cdot \beta_{ind(j)}) \quad (10)$$

$$p(U_{ij}^F | X_{ij}^E, U_{-ij}^F, U^E, \gamma_{pos(i)}) = 1(U_{ij}^F < \overline{U_{ij}^F}) \cdot \phi(U_{ij}^F - X_{ij}^{E,T} \cdot \gamma_{pos(i)}). \quad (11)$$

When $(i, j) \in \mu_m$, the real compensation of the matched pair is observed. The correlation between the error terms provide additional information about the latent utilities, and the conditional densities are

$$\begin{aligned} p(U_{ij}^F | X_{ij}^E, X_{ij}^F, U_{-ij}^F, U_{ij}^E, \gamma_{pos(i)}, \beta, r_{ij}, W_{ij}, \alpha, \lambda, \kappa, \sigma_v^2) \\ = 1(U_{ij}^F > \underline{U_{ij}^F}) \cdot N(U_{ij}^F; \mu_{U_{ij}^F}, \sigma_{U_{ij}^F}^2) \end{aligned} \quad (12)$$

$$\begin{aligned} p(U_{ij}^E | X_{ij}^E, X_{ij}^F, U_{-ij}^E, U_{ij}^F, \beta_{ind(j)}, \gamma, r_{ij}, W_{ij}, \alpha, \lambda, \kappa, \sigma_v^2) \\ = 1(U_{ij}^E > \underline{U_{ij}^E}) \cdot N(U_{ij}^E; \mu_{U_{ij}^E}, \sigma_{U_{ij}^E}^2), \end{aligned} \quad (13)$$

where

$$\begin{aligned} \mu_{U_{ij}^E} &= [\lambda \cdot (r_{ij} - W_{ij}^T \cdot \alpha - \kappa \cdot (U_{ij}^E - X_{ij}^{F,T} \cdot \beta_{ind(j)})) + \\ &\quad \lambda \cdot X_{ij}^{E,T} \cdot \gamma_{pos(i)}) / \sigma_v^2 + X_{ij}^{E,T} \cdot \gamma_{pos(i)}] / (\lambda^2 / \sigma_v^2 + 1) \\ \sigma_{U_{ij}^E}^2 &= \frac{\sigma_v^2}{\sigma_v^2 + \lambda^2} \\ \mu_{U_{ij}^F} &= [\kappa \cdot (r_{ij} - W_{ij}^T \cdot \alpha + \kappa \cdot X_{ij}^{F,T} \cdot \beta_{ind(j)} - \\ &\quad \lambda \cdot (U_{ij}^F - X_{ij}^{E,T} \cdot \gamma_{pos(i)})) / \sigma_v^2 + X_{ij}^{F,T} \cdot \beta_{ind(j)}] / (\kappa^2 / \sigma_v^2 + 1) \\ \sigma_{U_{ij}^F}^2 &= \frac{\sigma_v^2}{\sigma_v^2 + \kappa^2}. \end{aligned}$$

These are the normal distributions that are truncated from above(below). The expressions for $\overline{U_{ij}^F}, \overline{U_{ij}^E}, \underline{U_{ij}^F}$ and $\underline{U_{ij}^E}$ are defined in (2).

Data

We find Twitter a proper social media to study RM rather than Facebook or LinkedIn. The asymmetric relation between friends on twitter makes the number of followers a sign of status. The one-to-many update on twitter, enables users to reach a board audience easily, compare to the other popular social networks such as Facebook. Therefore, one of the major roles Twitter serves is a news media (Kwak, Lee, Park, and Moon 2010). The default setting for profiles on Twitter is public. In addition, Twitter's 140 character limit gives the tool a different voice, a more industry based one because it is concise, real-time and frequent. It transforms long passages to small snippets which is great for attracting attention. All these features make Twitter a natural platform for use in self-promotion and make it a golden social media platform for self-promotion for politicians, media stars, scholars or even terrorists such as ISIS members. On Facebook, information mainly spreads between reciprocal friends. Showing off how excellent one is to friends can be awkward. LinkedIn, however, is a highly structural online resume profile network. More importantly, candidates for executive positions prefer not to reveal their job searching to the public until it is settled. Listing themselves explicitly on LinkedIn may not be desirable. Therefore, LinkedIn is not ideal for reputation management for executive level candidates.

We study data on executive employment records and compensation of S&P 500 constituents companies from 2010 to 2013. Especially, we exam the impact of reputation management on four executive positions: CEO, CMO (marketing and sales related chief officers), CTO (Technology related) and CPO (Chief Product Officer). We further remove executives who are close to retirement (older than 62) and founders and controlling holders (with ownership $\geq 5\%$). These standards are consistent with literatures as Jenter and Kanaan 2015, Gao, Harford, and Li 2013. Our Sample contains 2,122 employment records from 366 different companies. We divide the sample into independent markets. Each market contains the firms and executives for a certain position in a year. This yields 16 markets: 4 positions, for 4 years.

We analyze 133,173 posts from the personal twitter accounts of executives of S&P 500 firms. In Figure 1, we present a sample from our data. The formal CEO of cambell's in 2010 and the founder CEO of ConantLeadership. We can see from his personal account that the most recent tweets are about his current company with the business name as the wall paper of his account. Figure 2 indicates the most frequent words used in executives' personal tweets.



Figure 1. A Sample Twitter Account: The Formal CEO of CampbellSoup Co and founder of ConantLeadership



Figure 2. Word Cloud of Executives' Posts

Variables

We use size, profitability, firm risk, and corporate governance as the observed firm characteristics. We use $\ln(\text{total asset})$ to measure firm size. For profitability we use the average of industry adjusted return for the past two years. We calculate firm risk as the standard deviation of daily stock returns over the past three years (*Firm Risk*). Besides the above financial variables of a firm, we also include corporate governance variable. Jenter and Kanaan (2015) identify weak board with lower board independence fail to act against their CEOs when performance is dismal. Therefore we use fraction of the independent directors (*Indep%*) on the board to measure corporate governance as the existing literature.

We include three types of observed executive characteristics: benchmark for compensation, performance and RM, and its interaction in terms of performance. In particular, we use the past compensation and

unrealized compensation as the benchmark or expectation of next compensation. The previous compensation is a negotiation result an executive has received using the bargaining power with the information up to the past year. The time invariant demographic such as gender, college education would be already incorporated in the past compensation. Unrealized compensation is another part of the opportunity of job hopping. We use the sum of the estimated value of in-the-money unvested options and the aggregate value of unearned performance-based shares to measure unrealized compensation ($Unearn_{t-1}$). Typically these are the ongoing options of opportunities the candidate would have had if she had remained at her previous employer. Since we are focusing on the executives who are the head of the company, we use the old companies performance in return as a proxy for candidates past performance. performance. Coughlan and Schmidt 1985 and Warner, Watts, and Wruck 1988 are the earliest to show that firm's stock return affect compensation and management termination decisions. In order to take the performance momentum and industry heterogeneity into consideration, we calculate the change in the firm's relative performance and take the quantile of it as the performance measure ($perm$), which is $quantile(\Delta(ret_{i,t}/avgret_{ind(i)}))$. For CMO candidate, we use a more direct measure as $quantile(\Delta(SalesGrowth_{i,t}/avgSalesGrowth_{ind(i)}))$. Towers Perrin's Annual Incentive Plan Design Survey also finds that bonuses are more frequently based on a percentile ranking of performance relative to a peer group.

The last category of executive characteristics is RM and its interaction with performance. The effect of reputation management on social media depends on both effort and influence. We use the average number of tweets yearly to measure the effort executives exert on social media.

Since it is important that we rule out the posting or comments which are not considered work-related, we build a novel measure of RM-relevant contents upon a nature language processing technique: topic modeling. The unsupervised nature of the topic modeling method helps us to discover the hidden semantic structures in a text without requiring labor effort in reading and labeling job and company descriptions as well as executives' tweets. Formally, we treat each company and job descriptions and yearly tweets and comments as documents. The generative process of an LDA topic model assumes that each word in a document arose from the realization of a randomly selected topic according to document-specific topic proportion. We report the top 10 keywords of the 10 topics in Table 1.

Using LDA topic modeling, we discover different topics and identify the mixture of topics for each document. For each document, a vector of topic proportions is calculated with its elements summing up to 1. We set the number of topics to be 30, where each topic is represented by a bag of relevant words. Therefore, the LDA algorithm represents a document by a topic distribution $T^{Job\&Comp}_{i,j,t}$ or $T^{Tweets}_{i,j,t}$. The work-related proportion of content can be captured using the cosine similarity of the two corresponding topic distributions as:

$$relevance_{i,j,t} = \frac{T^{Job\&Comp}_{i,j,t} \cdot T^{Tweets}_{i,j,t}}{|T^{Job\&Comp}_{i,j,t}| \cdot |T^{Tweets}_{i,j,t}|}$$

We use the number of followers as a proxy of influence on social network. Thus, the RM is defined as:

$$RM = \begin{cases} 0 & \text{if no work related tweets} \\ \text{quantile}(\ln(Tweets \cdot relevance \cdot \# followers)), & \text{otherwise} \end{cases}$$

We include two interactive terms of RM and performance. They are $RM \cdot perm$ and $RM \cdot perm^2$.

Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6	Topic 7	Topic 8	Topic 9	Topic 10
compliance	storage	america	sale	user	product	https	sell	leadership	new

risk	solutions	north	developm ent	provide	group	http	software	organizat ion	product
managem ent	informati on	europe	organizati on	across	segment	you	digital	company	ideas
all	managem ent	africa	objective	sports	software	great	store	directors	innovation
officer	infrastruc ture	brand	marketing	news	platforms	our	applicatio ns	responsi bilities	scientific
chief	provide	group	managem ent	video	data	thanks	devices	board	projects
legal	data	consumer	strategy	devices	market	all	products	direction	developme nt
including	enterprise	east	performa nce	mobile	internet	out	third- party	ceo	research
policies	security	travel	initiatives	including	cruises	who	manufact ures	develop ment	budget
procedure s	software	middle	business	web	corp	time	designs	ideas	discovery

Table 1. Top words of 10 Topics

Results

Empirical Findings

Our joint estimation results are reported in Table 2, 3 and 4. The results are based on 50,000 draws from which the initial 25,000 are burn-in. Visual inspection of the trace plots shows that the Gibbs sampling convergence to the stationary posterior distribution.

Assortative Matching on Observed Variables

The estimates of the matching process of the structural model provide evidence of sorting on the observed variables, while, the value of utilities represent the agents preference over all potential matches. Estimates of the utilities of two sides are presented in Table 2 and 3.

	CEO	CMO	CTO	CPO	$\overline{dP} / dX_{ij}^E$
Unearn _{t-1}	6.1572***	2.6759***	1.7166***	4.3323***	0.8382
	(0.0720)	(0.4157)	(0.3921)	(0.6170)	
Comp _{t-1}	2.2487***	6.0768***	2.9007***	6.0019***	0.8023
	(0.0220)	(0.3814)	(0.5797)	(0.3754)	
RM	0.4167*	0.4773*	0.6555*	0.7754	0.1600
	(0.2541)	(0.2745)	(0.3995)	(0.6788)	
Perm	0.0639*	0.1701**	0.1914	0.2271**	1.0000
	(0.0343)	(0.0843)	(0.1322)	(0.1164)	
Perm ²	0.0047	-0.0105	-0.0039	0.0083	
	(0.0390)	(0.0903)	(0.0970)	(0.1139)	

RM·Perm	1.3131***	1.2304***	4.1919***	13.7414***	
	(0.0328)	(0.3306)	(0.3119)	(0.3624)	
RM·Perm ²	7.5061***	6.2177***	9.3398***	17.6573***	
	(0.6500)	(1.2855)	(1.2603)	(1.4271)	
Attached	-0.9837***	9.7114***	12.0108***	6.7092***	0.6217
	(0.0250)	(0.1812)	(0.5343)	(0.3241)	

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 2. Estimates of Firm Utility Equations

The estimated coefficient of RM is mostly positive except for CMO market. The interaction between RM is significantly positive at the 1% level. This result reveals that RM is more effective when the change in performance is bigger. The interaction $RM \cdot perm^2$ is also positively significant at the 1% level, showing that the utility one candidate can bring to the firm increases especially more for candidates with extreme performance. The coefficient of RM varies across markets. To illustrate the net impact of RM on firm utility with different performance, we visualized our result of net impact on utilities using heat maps in Figure 3.

$$Net\ impact\ on\ utility = \gamma_{pos,3} \cdot RM + \gamma_{pos,6} \cdot RM \cdot perm + \gamma_{pos,7} \cdot RM \cdot perm^2$$

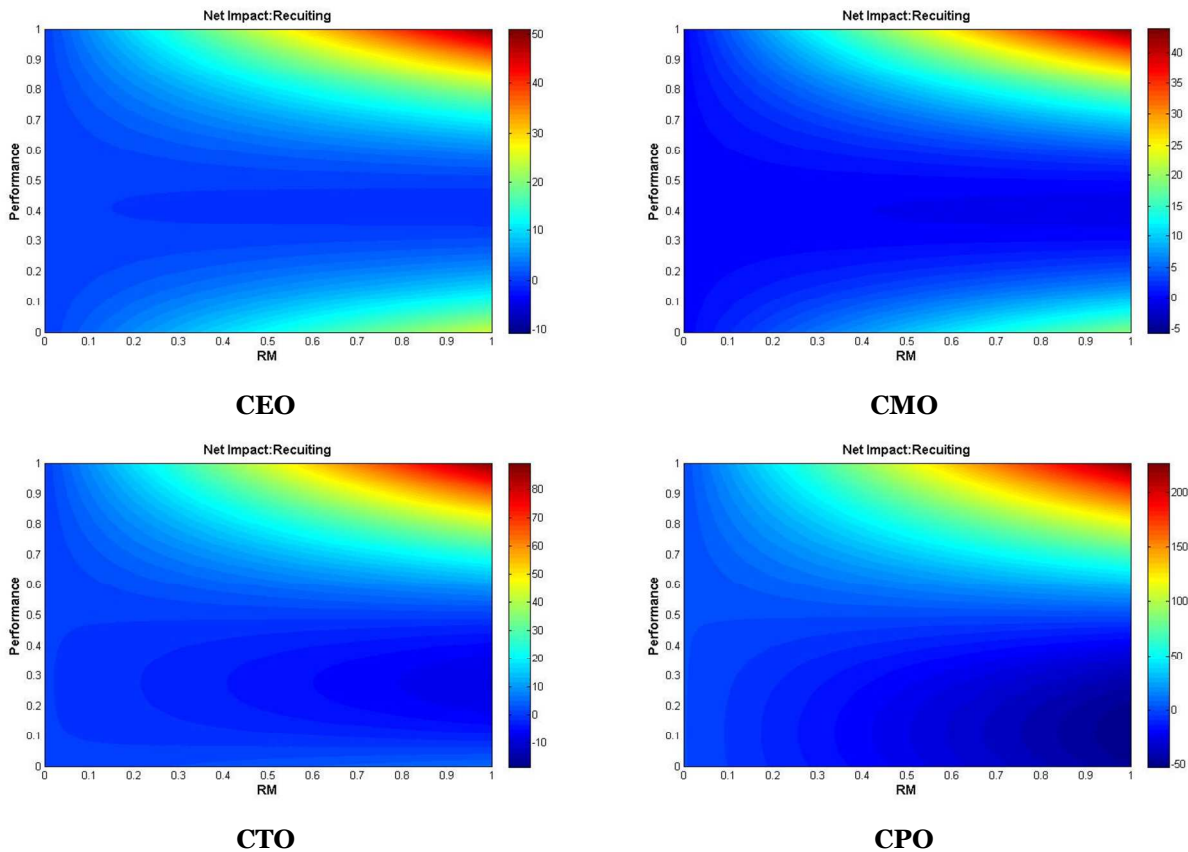


Figure 3. Net Impact of RM on different Markets

We can see that RM is beneficial for candidates with a wide range of recent performance in market CEO and CMO, as the net impact of RM on utilities are positive for both candidate with very high and low past performance (upper and bottom right corner of the heat maps). On contrary, it is restrictively to be helpful only to outstanding candidates in CTO and CPO markets. It can be resulting from the different

nature of the executive markets. CTO and CPO markets are more objective and the outcome will be easy to verify, while the jobs of CMO and CEO subject to economic shocks and is vulnerable to uncertainty. Another major difference of the two types of markets is how markets react to self-promotion behavior of less successful candidates. The market of CPO and CTO punish them for finding excuses while the CEO and CMO markets are more convinced by their stories which may be because of the highly information asymmetry of those markets.

The estimates for performance are positive and statistically significant in the markets of CMO and CPO under 5% level, and suggested to be significant in market CEO. These results show that there is revealed preference of outstanding candidate. The other control variables such as unrealized and past compensation are all significantly positive demonstrate candidates with higher past pay and deferred compensation are more attractive. This may be because the markets interpret the past price of candidates as a signal of his/her capability. Finally attachment for most markets are positive and significant. That is for most executive positions, firms prefer to keep their current executive. The exception is for CEOs firms are willing to consider outsiders as the next head of the company. This may be because the CEO is directly respond to performance therefore bringing in new CEO would be a straight forward solution to shareholders in many circumstances such as reviving the company, exploring new area and steering to new products or services.

To better interpret the economic magnitudes of coefficients in the utility equation, we calculate the marginal probability advantage of every covariate. In the matching process, all estimates are only identified up to scale and normalized by variance of the error terms. Therefore, we cannot interpret the estimations directly. The marginal probability advantage provides us intuitive insight as the marginal increase in probability of agents preferring one partner over another which only differs in one dimension. Consider a firm facing a choice between two applicants with identical observed characteristics, the choice is completely determined by the unobserved capability of the candidate. Therefore the probability of being preferred to the other one is 50%. Now suppose one candidate's RM is 0.75 quantile while the other one is 0.25. The probability that a firm prefers the highly engaging in RM candidate is 58%. A marginal probability advantage giving be the difference in RM is 58 %-42%=16%. It shows by being active in RM, it gives a candidate a 7-to 5 advantaged if both are competing for the same position. Formally, the marginal probability advantage for observed executive characteristics is calculated as

$$\Pr(x_{ij}^{E,T} \cdot \gamma_{pos(i)} + \delta_{ij} > x_{ij'}^{E,T} \cdot \gamma_{pos(i)} + \delta_{ij'}) = 2 \times \Phi\left(\frac{x_{ij}^{E,T} \cdot \gamma_{pos(i)} - x_{ij'}^{E,T} \cdot \gamma_{pos(i)}}{\sqrt{2}}\right) - 1$$

Note that $\gamma_{pos(i)}$ is a vector when evaluating a variable which involves in interaction terms as well, otherwise it is a scalar. We report the point estimation of marginal probability advantage as

$$2 \times E_{\beta|} \Phi\left(\frac{x_{ij}^{E,T} \cdot \gamma_{pos(i)} - x_{ij'}^{E,T} \cdot \gamma_{pos(i)}}{\sqrt{2}}\right) - 1$$

We also define and calculate the marginal probability advantage for observed firm characteristics similarly.

We report the average marginal probability advantage of observed executive characteristics across markets in the last column of Table 2. We can see that firms have a clear preference over performance as they will strictly prefer a candidate with 0.75 quantile performance to 0.25, all else equal. Being a past employee with the firm gives 62.17% advantage of being employed rather than an otherwise identical outsider.

The estimations of executive's utility equation is shown in Table 3. We can see that across different sectors, firm size is almost always significantly positive. This shows from the perspective of a candidate, big firms are more attractive. Outsider-dominated boards are less favorable as the estimates are all negative and significant in 3 out of the 8 sectors. This finding is consistent with empirical evidence in corporate finance as a board with a high proportion of independent members makes it hard for an executive to compromise the board of directors. Weisbach (1988) finds that firms with a higher proportion of independent board members are more likely to remove their CEOs based on accounting and

stock price performance. Finally, candidates view staying with the current employers as a good choice. The last row in Table 3 shows the marginal increase in the probability is 20% meaning firms with 0.75 quantiles in size will be 20% more likely to be preferred than the 0.25 quantile in size counterparts. The clearest sorting over firm characteristics is attachment, with the marginal probability advantage of 97.67%. This shows executives always prefer past employer given all else equal. Comparing the sorting of companies, we find candidates value big company size and profitability the most for the mining industry and retail companies respectively. We find this result intuitive since the mining industry is capital intensive. Therefore company size is a crucial measure of the companies. Retail companies aim at a high turnover rate and sales margin so that profitability is one of the most important aspects of their operations.

Sector	Ln(Asset)	Ret _{t-1,t-2}	Indep %	Firm Risk	Attachment
Agri	0.2855*	0.1400	-0.0798	0.1216	4.0389***
	(0.1617)	(0.3179)	(0.1054)	(0.3204)	(0.8230)
Mining	0.4701***	0.0387	-0.0132	-0.0340	3.7430***
	(0.0379)	(0.0383)	(0.0452)	(0.1574)	(0.1792)
Constr	0.2345**	0.2001	-0.0468	0.0895	4.1718***
	(0.1116)	(0.2268)	(0.0746)	(0.3288)	(0.6883)
Mfg	0.2147***	0.0343***	-0.1052***	-0.0772	2.6276***
	(0.0246)	(0.0119)	(0.0184)	(0.0598)	(0.0196)
Trans, Comm	0.2805***	0.2626*	0.0565	0.0481	4.5866***
	(0.0425)	(0.1533)	(0.0563)	(0.1645)	(0.3354)
Wholesale	0.1174	0.1180	-0.1073	0.0543	4.0052***
	(0.1379)	(0.2241)	(0.0905)	(0.1952)	(0.3360)
Retail	0.2053***	0.4836***	-0.0451**	0.2161	3.3103***
	(0.0495)	(0.1390)	(0.0233)	(0.1423)	(0.1008)
Services	0.0473*	0.0401	-0.0600**	0.1952*	2.4619***
	(0.0278)	(0.0528)	(0.0307)	(0.1223)	(0.0534)
Pub Admin	0.2731***	0.1198	-0.0697	-0.0155	4.0457***
	(0.0759)	(0.3098)	(0.1259)	(0.0192)	(0.6630)
$\frac{dP}{dX_{ij}^F}$	0.2000	0.0133	-0.0317	0.0048	0.9767

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3. Estimates of Executive Utility Equations

Compensation Negotiation

The coefficients in bargaining equation (4) estimate the response of compensation on the observed characteristics of both sides after controlling for matching. The coefficient of the interaction of RM and performance is positive and significant, which shows compensation increases with better performance and a higher level of RM. The performance on its own is significant positive as well. Unrealized compensation and past compensation have a positively significant effect on increasing compensation, confirming that these are vital benchmarks for determining the pay in the next contract. It can be a result of both signaling the executives past capability and momentum in compensation. Firm size plays a significantly positive role in compensation, as documented in many papers (Xavier Gabaix 2008; Terviö 2008; Gayle and Miller 2009; Gayle, Golan, and Miller 2015). Another major source of variation from

firm characteristics in executive pay is independence of the board. From Table 4, we can see after controlling for matching, firms with stronger governance structures pay more. Combining the results of board dependency in Table 3 and 4, yields interesting conclusions. In the hiring process, executives, in general, are 3.17% less likely to choose a firm with highly independent board controlling for all other observed firm characteristics as probably these firms have smaller agency problems and are harder to enchant. However, we observe that in the bargaining process, firms with independent board pay executive with a premium to attract them. Finally, the estimated variance of the error term in bargaining process is 0.0843 showing that the model fits our observation well.

Compensation			
Firm Characteristics		Executive Characteristics	
Ln(Asset)	0.1854 ***	Uearn _{t-1}	0.2655 ***
	(0.0172)		(0.0187)
Ret _{t-1,t-2}	-0.0316*	Comp _{t-1}	0.2410***
	(0.0166)		(0.0218)
Indep%	0.0901 ***	RM	0.1233
	(0.0170)		(0.1811)
Firm Risk	0.0073	Perm	0.0331*
	(0.0175)		(0.0170)
Const	-1.8169 ***	Perm ²	-0.0037
	(0.3075)		(0.0241)
κ	0.5082 ***	RM·Perm	0.0528***
	(0.0290)		(0.0176)
λ	0.6593 ***	RM· Perm ²	0.0085
	(0.0234)		(0.0716)
σ _v ²	0.0843	Attached	0.6796*
	(0.0126)		(0.4050)

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 4. Estimates of compensation Equations

Visualizing the net impact of RM on compensation in our structural model, we find RM only benefits candidates with top 0.619 quantiles of performance. For the relatively successful candidates, the more they self-promote, the higher compensation they earn. However, according to Figure 4, for the rest 38.1% of the candidates, the markets punish their RM behaviors by decreasing the compensation.

$$Net\ impact\ on\ compensation = \alpha_8 \cdot RM + \alpha_{11} \cdot RM \cdot perm + \alpha_{12} \cdot RM \cdot perm^2$$

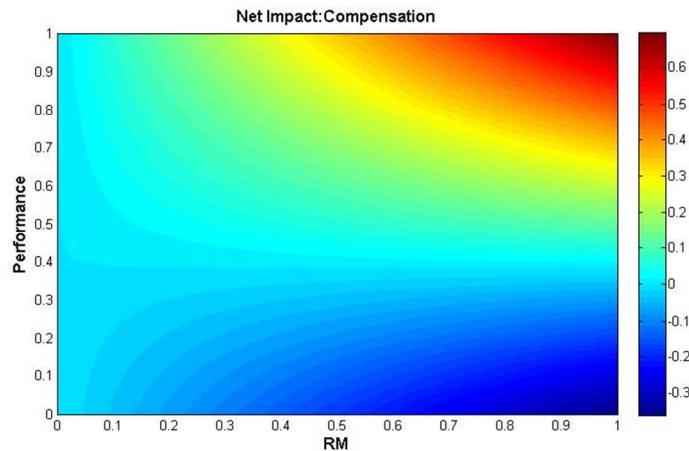


Figure 4. Net Impact of RM on Compensation**Robustness Checks****Industry Trends of Executive Compensation**

In this section, we further incorporate industry trends of compensation by introducing time dummy, industry dummies, and their interactions. Instead of estimating an average baseline salary for all industries across four years using the constant term in equation (6), we refine the bargaining process by dividing the sample period into first and second half (2010-2011 and 2012-2013):

$$r_{ij} = \alpha_0 + F_i^T \cdot \alpha_1 + E_j^T \cdot \alpha_2 + A_{ij}^T \cdot \alpha_3 + T \cdot \alpha_4 + S_{ind(i)} + I_{ind(i), ind(i) \neq pub\ ad\ min} \cdot T \cdot \zeta_{ind(i)} + \varepsilon_{ij}, \quad (14)$$

where T is the time dummy which takes one if the employment was for the year 2013-2013. $S_{ind(i)}$ is the industry fixed effect and $I_{ind(i)}$ is the industry dummy and we set the industry sector of public administration to be the baseline case.

The results are reported in Table 5. We can see the impact of RM on compensation is consistent with our previous results. Figure 5 shows that candidates with the top 62.21% past performance can boost their compensation using RM while the rest of them will be worse off with RM. For the control variables, the significance and signs are consistent except for performance, which is significant at the 10% level instead of 5%. The estimated coefficient of time dummy is positive. The coefficients of interactions between time and industry dummies show that among all nine industry sectors, the executive compensation in manufacturing increased the most, and the construction decreased the most.

Compensation			
Firm Characteristics		Executive Characteristics	
Ln(Asset)	0.1483***	Uearn _{t-1}	0.2598***
	(0.0248)		(0.0233)
Ret _{t-1,t-2}	-0.0175	Comp _{t-1}	0.2774***
	(0.0219)		(0.0233)
Indep%	0.0683***	RM	0.1457
	(0.0235)		(0.2299)
Firm Risk	-0.00342	Perm	0.1256*
	(0.0207)		(0.0759)
Const	0.2427***	Perm ²	0.0665
	(0.5270)		(0.3008)
T	0.2748	RM·Perm	0.0565***
	(0.7938)		(0.0213)
Industry Fixed Effect	Yes	RM·Perm ²	-0.0260
			(0.0873)
$I_{ind(i), ind(i) \neq pub\ ad\ min} \cdot T$	Yes	Attached	0.5679***
			(0.1650)

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5. Estimates of compensation Equations with Industry Trends

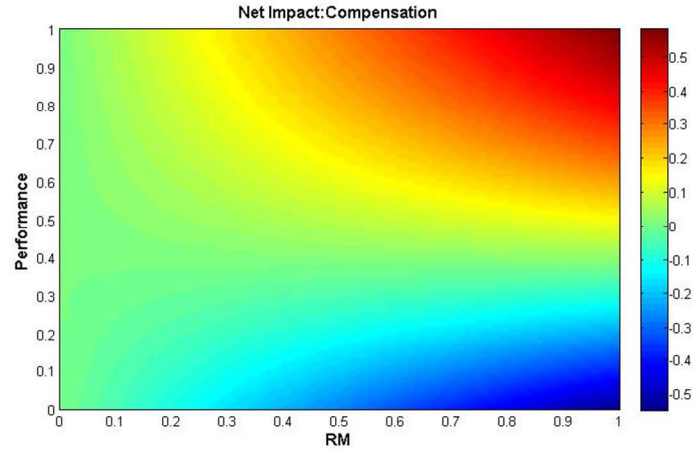


Figure 5. Net Impact of RM on Compensation

Conclusion

Perceived reputation and ability are vital in deciding an executive's career outcomes. However, prior literature has not yet examined the market mechanism with pre-matching investment in RM. We bridge this gap by modeling an executive as both born from achieved operating performance, and further, at least partly, made by reputation management.

This paper develops a new empirical matching model with heterogeneous tastes to provide an insight of how the executive labor market works. We are able to separately evaluate impacts of RM on the two jointly determined outcomes: outbidding other candidates and adding zeros on their paychecks. We leverage the interaction in decision making between executives to solve the endogeneity problem. That is, because of sorting in the recruiting process, the existence of other candidates affects the matching results and leads firms with different characteristics to hire candidates with similar unobserved characteristics for exogenous reasons.

We also introduce a better measure of RM: whether a candidate involves in twitter broadcasting. This is a better proxy compared to the vanguard works using media coverage and firm initiated press since a personal account mostly reflects the executive's viewpoints and explanations rather than the firm's or other groups'.

Our model directly applies to optimizing reputation management strategy. It can serve as a methodology to help executives to decide when and how much effort they need to put into self-promotion to get recruited by a target firm and further, boost his/her salary to a certain level. In addition, the results point out a potentially profitable way to re-engineer the business model for Twitter. The counterfactual analysis provides the social media a basis of pricing the use of their services and userbases for self-promotion purposes. It can be profitable for Twitter to come up with a freemium business model for reaching to a large audience or a verified account to prevent malicious uses of fake accounts by competitors.

Although our model provides a very useful framework, there are limitations to the current model. It leaves the choice of RM unanswered. Our model focuses on how markets interpret and price RM given the past performance and RM. However, incorporating dynamic preferences into the model would be one of the other fruitful avenues to pursue for future research.

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