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**RESEARCH ARTICLE**

# Promotion Standards and Practices across the Business Cycle: Evidence from Korea

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**Abstract:** Korean employers notoriously practice seniority-based personnel management, rather than one prioritizing workers' skills or performance, and this has changed only slowly amid the evolving business landscape and advancing labor standards. This study contributes to understanding this phenomenon by assessing Korean firms' promotion criteria and practices over the past decade across distinct phases of industry business cycles, and between the economy's primary and secondary sectors. Primary-sector firms are shown to be less likely than secondary-sector firms to base their promotion decisions on the analysis of workers' achievements and colleague ratings, but rather on their performance of core job duties. Primary-sector firms have more advancement steps within their management ranks, and longer wait time until promotion at all ranks. Secondary-sector firms are flatter hierarchically, featuring shorter time to promotion at all ranks and fewer advancement steps, but also a lower fraction of promotions based on special merit. Firms' promotion practices change over the business cycle. During expansionary years, the hierarchical dispersion of workers within organizations widens, particularly among primary-sector firms, with more workers remaining as regular staff but more managers promoted to senior management. As firms recruit more regular staff, years to promotion to managerial positions, and the count of advancement steps increase. Business expansion induces firms to streamline promotions to management based on colleague ratings subject to lesser review of workers' own achievements. Over the past decade, promotions by special merit have receded while those by colleague ratings have gone up. Firms are thus apparently not transitioning toward merit- and achievement-based promotions, and continue relying on subjective colleague ratings and job-content analysis in their stagnant hierarchical structures. This has implications for workers and for policymakers tasked with ushering in more inclusive, objective and meritocratic personnel management practices.

**Keywords:** Human resource management, Seniority-based promotion, Organizational change, Corporate governance, Human Capital Corporate Panel, Korea

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## 1. Introduction

Korean workers have traditionally relied on lifetime careers within single organizations, and Korean employers have practiced personnel management with consideration to workers' seniority and even family circumstances, rather than prioritizing their qualifications, ability or performance. These practices undergo gradual changes with the evolution of production processes, labor market governance, and social norms. The scale of promotions at different ranks within companies, and criteria for promotion are expected to fluctuate systematically across distinct phases of business cycles, as firms encounter different economic constraints and opportunities in the external output and factor markets, as well as in the internal factor market.

This study evaluates empirically how firms' personnel promotion standards, and particularly the criteria in promotion decisions and observed promotion practices, have changed over the past decade across distinct phases of business cycles, in different segments of the Korean labor market. Given the widespread recognition that the Korean labor market is fragmented into primary and secondary segments, in which firms and workers with vastly different characteristics operate under distinct labor standards, the study distinguishes the trends across the two market segments.

In particular, this study evaluates changes in firms' promotion practices with respect to: typical years to promotion at different ranks of the company; how many advancement steps workers must scale before being promoted to a higher rank; and the fraction of promotions that are based on special merit rather than on seniority. Firms' reliance on various factors in their promotion decisions - binary indicators for the analyses of achievements, performance of job duties, certifications, and colleague ratings - is also assessed. Finally, the first year of the firm-level survey (removed from subsequent waves) allows testing the scale and composition of promotions by within-firm rank and by gender, and the official and actual rating standards for promotion. These variables jointly shed light on the official career management systems at firms and the actual career-progress conditions faced by firms' workers.

The variation in firms' promotion standards and practices across the business cycle has not been studied adequately - particularly in Korea - even as firms' hiring, compensation and layoff decisions have received extensive attention following the 1997 Asian crisis and the 2007-2009 global financial crisis. One reason for this omission in prior literature is the general lack of information on the standards and functionings of firms' internal career management systems. Furthermore, empirical guidance regarding how to delineate the Korean primary- and secondary-labor-market segments is missing. This study is a primer at addressing these gaps jointly. The study relies on unique microdata from the Korean Human Capital Corporate Panel (HCCP). This survey is ideal for classifying firms according to the effective market sector in which they operate, and for the study of cross-sectional as well as intertemporal variation in their career management systems and practices.

In what follows, this study first reviews the historical context of career management and promotion practices at Korean firms. Section 3 discusses predictions testable using the available data, empirical issues and appropriate correction methods, and data used in this study. Finally, sections 4 and 5 present the main findings and their limitations, and conclude with policy recommendations, and thoughts regarding future research directions.

## 2. Background

Korean employers traditionally practiced personnel management with consideration to group harmony, and workers' seniority and even family circumstances, in a "stratified male-breadwinner model" inspired by Confucian organizational philosophy [1,2]. They offered workers lifetime careers at the level and pace dictated by workers' seniority and perceived family needs. Government organizations practiced this personnel management system too, because it promoted social justice and harmony.

During Korea's transition from a developing- to a first-world status economy, the Korean government promoted programs conducive to national growth and social stability. The government supported major employers and exporting firms through cheap financing, public contracts, restrictive import regimes, and protection from labor unions. Worker unrest was uncompromisingly suppressed. In return, corporations allowed the government to intervene in their management and retain practices in pursuit of national development goals. Administrative systems of government agencies and private corporations were aligned [3].

However, Confucian and national-development influences in corporate culture have been adverse to flexible labor relations within firms, and worked against the drive to incentivize and empower workers. The extant norms emphasized authoritative leadership, hierarchical organizational structure, respect for seniority and appearance of harmonious relationships among workers, rather than open communication and workers' true workplace achievements. They led to repression of individual expression and freedoms at work [4,5].

By the late 1990s, due to competitive pressures in the

globalized marketplace, and the gradual phasing out of state intervention in the management of major corporations, Korean employers transitioned from the traditional human resource management (HRM) regime to one emphasizing performance [6-10]. The Asian crisis of 1997 and the following deregulation attempting to make factor markets more flexible and competitive brought this restructuring drive to the fore. Capital and labor market regulations were overhauled and explicit links between the government and corporate boards were cut, even as selective trade protectionism and public procurement practices favoring aligned firms continued [11].

The selective intervention of the state in the running of corporations and the uneven restructuring have resulted in fragmentation of the nationwide economy into the primary (the "haves") and the secondary (the "have nots") sectors [12]. In this state of duality, distinct firms compete for customer contracts and factors of productions, distinct customer contracts are on offer, and distinct groups of workers compete for career progress in the two sectors. Firms in the primary sector have a higher number of applicants per opening and can be more selective in recruiting [13,14]. They face lower turnover. They have nearly exclusive access to public procurement contracts, to the government's export promotion services, to large loans for investment or research, and through the resulting low risk of default - to low-cost financing. On the other hand, primary sector employers are more strictly regulated vis-à-vis their compliance with labor laws, and cannot, for example, cut costs during crises by keeping their workers on irregular or part-time status [15]. Workers in the primary sector have better qualifications from the country's primary universities,① and enjoy higher compensation and better non-salary benefits and working standards.

Firms and workers in the secondary sector find it nearly impossible to switch to the primary sector [16,17]. Competition among firms and among workers is thus effectively confined to the sector they operate in. This bifurcation has even given rise to the appearance of casteism among the Korean workforce [18].

The distinction of primary and secondary sectors extends to firms' internal labor markets and their personnel management practices. In the primary sector, employers are larger and thus typically more organizationally structured and hierarchical. In competing against other primary-sector employers and complying with labor regulations, they must provide workers with greater work assurances and more generous benefits. After an initial trial period, they must provide workers with full legal benefits and protections. Workers in primary-sector firms produce different products and services than secondary-sector workers, have different job descriptions, and their performance is subject to evaluation using different criteria. Learning and transfer of knowledge over time as well as across workers play more prominent roles in the primary sector.

These structural differences suggest that the two market segments exhibit different personnel management and promotion systems, based on their legacy or their expected performance [19]. To the extent that the primary and secondary segments experience economic volatility differently, subject to different timing and magnitude, their personnel management systems are also likely to evolve differently over time [15,20].

## The Past Decade

The systemic changes in the Korean economy are relevant to this study in view of the heterogeneous sample of firms and a long time frame considered. 687 firms from across various industries and provinces are used over the time span of nearly a decade, years 2005-2013. During that time individual segments of the Korean economy experienced various developments and economic shocks of varying degrees, gradually affecting firms' long-term positions in the market.

The long timeframe also means that firms faced different conditions in factor and output markets in the beginning, the middle, and near the end of the sample window. The Korean economy recovered from a global downturn in 2005, experienced steady growth until 2008, a recession in 2009, and slow and uneven recovery from it. Free trade agreements with several countries went into effect, affecting a large subset of industries. Labor laws pertaining to regular vs. irregular workers and other worker groups changed, with direct implications for firms' promotion policies and practices.

During 2005-2013, tightness of local labor markets varied significantly over time as well as across industries and provinces. Unemployment rate rose sharply in 2009-2010, and vacancy rate fell. The number of applicants per vacancy rose. Part-time and irregular employment became more prevalent, particularly among new labor-market entrants, and in some sectors of the economy. Working conditions and compensation policy became less generous in real terms.

Free trade agreements with the Association of Southeast Asian Nations, the European Union, India, Peru and the United States were all signed between 2007 and 2011, and entered into force between 2010 and 2012. This affected output market conditions and opportunities of

① Such as degrees from the prestigious Seoul National, Korea and Yonsei (SKY) universities.

selected Korean firms, and set apart exporting, importing and non-trading firms. Finally, rules for financing from abroad, and corporate cross-ownership have been relaxed, potentially affecting corporate-board decision-making.

Labor laws regarding the treatment of irregular workers changed with the passage of the *Act on the Protection of Fixed-term and Part-time Employees* in 2007. Around 2007, the government also scaled up (re)training programs for job-seekers, irregular workers, workers of small-and-medium-size enterprises, female household heads, and other vulnerable groups. Employers received financial incentives to enroll their workers in such programs [21]. The *Workers Vocational Skills Development Act* (amended 2008) and the *Promotion of Industrial Education and Industrial Cooperation Act* (amended 2013) enacting a Vocational Education System were signed.②

The extent of variation in the economy over the sample period suggests that the panel data at hand are ideal for identifying trends in promotion standards and practices across various economic sectors, over time, as well as across different phases of business cycles. To estimate these effects accurately, however, we will need to account for changes unrelated to the events of interest, using available information, including firms' size and management structure, labor organization, reliance on international trade for revenue, nationwide time-varying shocks, and industry fixed effects.

## 3. Testable Hypotheses, Empirical Methods and Data

Firms' promotion policies have multiple and varying objectives including selecting the most capable workers for positions of greater responsibility, rewarding individual and team performance, sustaining worker loyalty, and attaining workforce harmony [22-24]. These objectives vary in their salience across economic sectors and years, as postulated by the contingency theory [25,26]. Employers continually adapt their practices as their playing field metamorphoses.

In view of the norms and recent history of the Korean economy, we can formulate several hypotheses regarding the variation in promotion systems across different sectors of the economy and different time periods [26].③ The first hypothesis relates to the distinction of promotion standards and practices between primary and secondary sector firms. Existing studies have shown that small and medium-sized firms have faced lesser regulatory and external scrutiny than their larger counterparts, and have practiced arbitrary subjective human resource management including recruiting, promotion and dismissals based on, say, colleague ratings [27,28]. In view of greater regulatory pressure and competitive pressure from foreign markets faced by primary-sector firms, we anticipate the following:

*Hypothesis 1:* The promotion decisions at primary-sector firms are based more on objective criteria and on individual contributions than those at secondary-sector firms.

In particular, the promotion decisions at primary-sector firms are thought to be based more on workers' achievements or special merit, rather than on subjective colleague ratings and workers' tenure in a position.

The second hypothesis relates to the changes in promotion standards and practices over time. It has been advanced that in the aftermath of the 1997 crisis, Korean firms responded by adopting performance- and merit-based human resource management [10]. Since then, as the regulatory and competitive environment across Korean industries continues tightening over time, we hypothesize that:

*Hypothesis 2:* Firms' promotion decisions evolve to be based more on objective criteria and on individual contributions.

A corollary to this hypothesis links it to the first hypothesis: As the market conditions facing primary-sector firms change at a faster pace than those facing secondary-sector firms, while the structural separation between the sectors remains, we hypothesize that:

*Hypothesis 2a:* The promotion decisions at primary-sector firms evolve toward more objective and merit-based criteria faster than those at secondary-sector firms.

② Tangentially related to this analysis, new antidiscrimination laws were introduced in step with social developments and public drive to assist vulnerable groups and to facilitate equal opportunities. Newly enacted were the Act on the Prohibition of Discrimination of Disabled Persons and Remedy against the Infringement of Their Rights (2007, amended in 2011), Ministry of Employment and Labor's guidelines for appropriate recruiting practices [16], and the Act on the Promotion of Economic Activities of Career-Interrupted Women (2008). Most recently, the Act on the Protection of Dispatched Workers (2012) was introduced.

③ The following hypotheses are limited to the supply side of promotion decisions - the considerations used by human-resource officers in different market circumstances to award promotions in the available pools of workers at each rank of the firm. The hypotheses are thus consistent with the vacancy-chain theory [29]. Demand-side considerations, including workers' availability, desire to be promoted or their skill sets, are assumed away. This reflects the employer-side data available in the HCCP and is reasonable given the notorious difficulty and high desirability of making career progress at Korean firms.

The third set of hypotheses concern the changes in criteria for promotions across different phases of industry business cycles. The only guide from prior literature relates to firms' responses to the financial crisis of 1997 and the lean years that followed. As the competitive and factor-cost environment in which firms operate tightens during contractionary and stagnationary years - and as it is replaced with the aspiration to preserve status quo in firms' human resources during expansionary years - it is expected that:

*Hypothesis 3*: Firms' promotion decisions alternate between merit-based, individual-level performance-focused criteria in recessionary years, to criteria prioritizing subjectively-assessed team outcomes and workforce harmony in expansionary years.

A corollary to this hypothesis is that, to the extent that industry business cycles affect primary-sector firms more severely than secondary-sector firms - because of their international exposure, reliance on pro-cyclical public contracts, tighter regulation and unionization, and greater complexity of their operations in factor and output markets - we expect that:

*Hypothesis 3a*: Primary-sector firms exhibit more variable promotion standards and practices between contractionary years (merit-based, individual-level performance-focused criteria) and expansionary years (subjectively-assessed team outcomes and workforce harmony) than secondary-sector firms.

The set of Hypotheses 1-3a is testable empirically using panel data in the HCCP surveys with appropriate dependent and explanatory variables. The following sections describe the tests and the available data.

### 3.1 Empirical Approach

To investigate quantitatively the nature of firms' promotion standards and observed practices, as well as their divergence across market sectors and time periods, several complementary variables are analyzed. Attention is restricted to dependent and explanatory variables available for all five survey waves. With regard to firms' practices, years to promotion among regular staff and among management, and the count of advancement steps within the two ranks are studied as indicators of the steepness and periodicity of promotions at firms. The fraction of promotions based on special merit is an indicator of the frequency of merit and non-merit based promotions. These are all cardinal categorical variables that can be analyzed using linear least-squares regressions controlling for firms' characteristics and market conditions. With regard to firms' promotion standards, three complementary ordinal variables are used - consideration of workers' achievements, job content, certifications, and colleague ratings in promotions. These are binary variables that can be analyzed using linear (least-squares) probability models.④

The main explanatory variables of interest are an indicator for the phase of the business cycle, namely growth rate of industry income, and an indicator for the likelihood that a firm operates in the primary sector of the country's labor market, as well as their interaction term. Among other important control variables, measures of firms' corporate governance and organization of firms' HRM systems are accounted for. In particular, firm's organizational structure (headquarters only, subsidiaries only, subsidiary of another parent company), management structure (degree of professionalism of management, foreign management) and the degree of labor unionization are considered.⑤ In regard to firms' HRM systems, we evaluate whether the firms' boards include a personnel committee, whether the firms have a dedicated HR department, how integrated and functionally differentiated the departments are, and the size of the HR departments.

The reduced-form models of the merit-groundedness of firms' promotion standards and promotion practices take the form:

$$merit\_practices_{it} = f(x_{it}\,,\, b_t\,,\, w_i\,,\, x_{it}\times b_t) + e_{it} \quad (1)$$

and

$$merit\_standards_{it} = g(x_{it}\,,\, b_t\,,\, w_i\,,\, x_{it}\times b_t) + \varepsilon_{it} \quad (2)$$

Here $f(\cdot)$ and $g(\cdot)$ are functions of the respective explanatory variables at the level of each firm $i$ and survey period $t$, and their parameters. $f(\cdot)$ and $g(\cdot)$ are assumed linear in parameters. $x_{it}$ are firm-specific time-varying factors,

④ The conceptually preferable conditional logit and probit regression models with fixed effects have serious empirical shortcomings. Conditional logit omits any firms for whom the binary dependent variable is constant across all time periods [30], significantly reducing effective sample size - by 73-86% in our analysis. Fixed-effects probit is known to yield the incidental parameter bias - the mis-estimation of marginal effects when fixed effects are subtracted out of the dependent variable [31]. Finally, probit or logit models without fixed effects are expected to produce biased estimates due to suspected correlation of latent fixed effects and explanatory variables of interest. As a check of robustness to sample size and model specification, the results of conditional logit models, estimated on much smaller samples of 110-558 observations, are reported in the appendix. These results are qualitatively very similar to those for linear probability models, with 80% of coefficients having the same signs.

⑤ In addition, foreigner share in firm equity, and the existence of formal statutes for employee matters, democratic approach to subordinates, and clear vision about the management of HR development have also been considered to control for potentially time-varying firm-specific effects. These variables were eventually omitted for lack of clear conceptual and empirical significance.

$b_t$ are time-varying variables common to numerous firms, and $w_i$ are time-constant observable or unobservable characteristics of individual firms. $x_{it}$ , *bi,* $w_i$, $x_{it} \cdot b_t$ may contain different variables across $f(\cdot)$ and $g(\cdot)$. Industry-level subscripts are omitted from all variables for clarity of presentation, even though we can easily imagine industry-level determinants of firms' promotion standards and practices in addition to firm-level and nationwide effects. For one, $b_t$ includes the phase of a business cycle in firms' industry, varying across industries but constant across firms within each industry. Estimation of coefficients on $x_{it}$ , *bi,* $x_{it} \times b_t$ facilitates the testing of Hypotheses 1-3a. Under Hypothesis 1, the coefficients on a primary-sector indicator should be positive: $\alpha_{primary} = \partial f / \partial x_{prim\ it} > 0$, $\beta_{primary} = \partial g / \partial x_{prim\ it} > 0$. Under Hypothesis 2, the coefficients on a time-trend indicator should be positive: $\alpha_{yr} = \partial f / \partial b_{yr\ t} > 0$ , $\beta_{yr} = \partial g / \partial b_{yr\ t} > 0$. Under the corollary Hypothesis 2a, the coefficients on interaction terms of time-trend and primary-sector indicators should be positive: $\alpha_{prim \times yr} = \partial f / \partial (x_{prim\ it} \times b_{yr\ t}) > 0$, $\beta_{prim \times yr} = \partial g / \partial (x_{prim\ it} \times b_{yr\ t}) > 0$. Under Hypothesis 3, the coefficients on an industry-growth indicator should be negative: $\alpha_{growth} = \partial f / \partial b_{growth\ t} < 0$, $\beta_{growth} = \partial g / \partial b_{growth\ t} < 0$. Finally, under the corollary Hypothesis 3a, the coefficients on interaction terms of industry-growth and primary-sector indicators should be negative: $\alpha_{prim \times growth} = \partial f / \partial (x_{prim\ it} \times b_{growth\ t}) < 0$, $\beta_{prim \times growth} = \partial g / \partial (x_{prim\ it} \times b_{growth\ t}) < 0$.

To the extent that some components of $w_i$ are unobservable, the overall error terms in Equations (1) and (2), $(e_{it} = w_{unobs\ i} + \bar{\varepsilon}_{it})$ and $(\varepsilon_{it} = w_{unobs\ i} + \dot{e}_{it})$, have two components - unobserved time-constant heterogeneity and time-varying idiosyncratic disturbance. Because the time-constant error component is likely to be correlated with explanatory variables of interest, regressions with fixed effects are appropriate. Firm-level fixed effects are thus used in benchmark regressions, but fixed effects at the level of industry-group are also considered due to a concern that the limited variation in firms' primary-sector indicator over time may make it difficult to estimate its effect precisely.⑥ Much of the unobserved time-constant heterogeneity that may be correlated with $x_{it}$ is expected to occurs at the industry-group level.

For a number of reasons - including self-reported nature of the dependent variables and their non-normal distribution; possible measurement errors in explanatory variables; and firm-level heterogeneity - model errors are expected to be heteroskedastic and correlated over time. In regressions, standard errors robust to arbitrary heteroskedasticity and firm-level autocorrelation are used for inference.⑦

### 3.2 Data

Information on Korean firms' human-resource and promotion systems is available from microdata in the Human Capital Corporate Panel (HCCP) survey. HCCP provides an ideal combination of a large cross-sectional dimension, representativeness for the underlying population of firms from across the economy, and an adequate time dimension. The HCCP is administered biannually by the Korea Research Institute for Vocational Education and Training (KRIVET) and covers 571~687 firms from across the Korean economy [32]. The KRIVET has recently released the fifth wave of the HCCP for year 2013, making this study particularly relevant as it covers recent data.

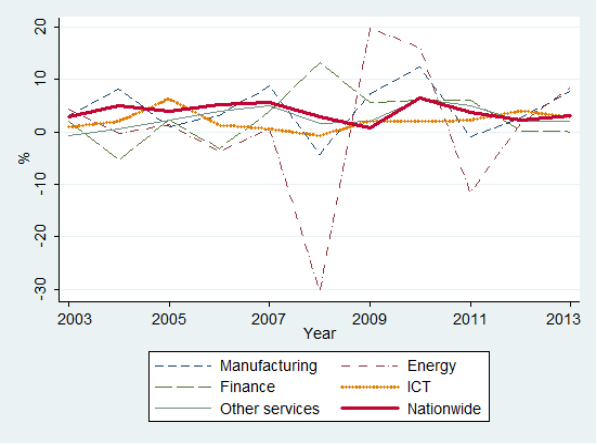
The HCCP is a unique survey of firms from across most industries and regions in the Korean economy. The panel contains 3,290 observations usable in this analysis, for 687 firms and five biannual time periods. The panel nature of the dataset allows us to control away firm- or industry-specific effects in order to focus on general trends across all firms. While the panel is unbalanced, 621 firms appear in all five waves, indicating high quality of sampling. Firms in the panel have been selected randomly and are generally representative of the overall makeup of firms in the Korean economy.⑧ The five waves incidentally come from different phases of the business cycle, namely years 2005, 2007, 2009, 2011, and 2013, when the nationwide economy experienced economic recovery, expansion, contraction, and two stages of a slow recovery, respectively. In that respect, the time period that our analysis covers provides an ideal setting. This survey can thus be used to follow a large number of heterogeneous firms over all phases of the country's business cycle. Moreover, the pattern of growth has varied significantly across industries (refer to Figure 1), facilitating identification even in

⑥ Industry-specific fixed effects cannot be used reliably. HCCP survey has changed the way it asks about firms' industry across years. Secondly, industrial classification system in Korea has also changed. Industry-level fixed effects would likely assign a different effect to different years for some companies.

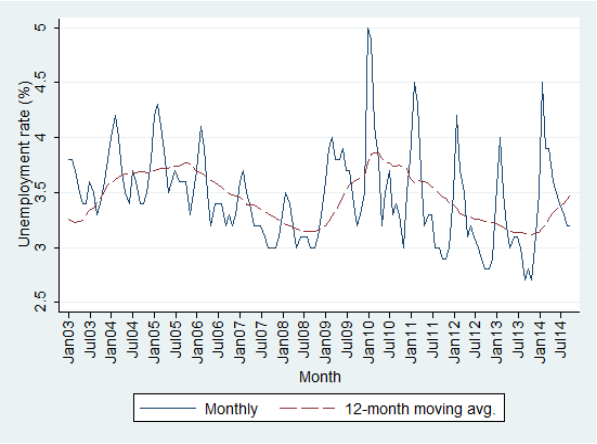
⑦ Heteroskedasticity and autocorrelation in errors were tested using the Breusch-Pagan and Breusch-Godfrey tests, respectively. The baseline hypotheses of no heteroskedasticity and no autocorrelation were rejected in some model specifications with or without fixed effects.

⑧ Sampling or response weights are not provided in the HCCP. The population from which the sample has been randomly drawn notably excludes easily identifiable firms (e.g., major *chaebol*); foreign-owned firms, firms with fewer than 100 employees, and firms in the following industries: agriculture, fishing, mining, tobacco, wood & leather manufacturing, publishing, medical instruments, material processing, utilities, construction, trade, hotels, transportation, real estate, public administration, health, other services. Reasons for attrition of individual firms across years include failure to establish contact with the firms, and firms' refusal to participate, fall out of survey frame because of their characteristics, and bankruptcy.

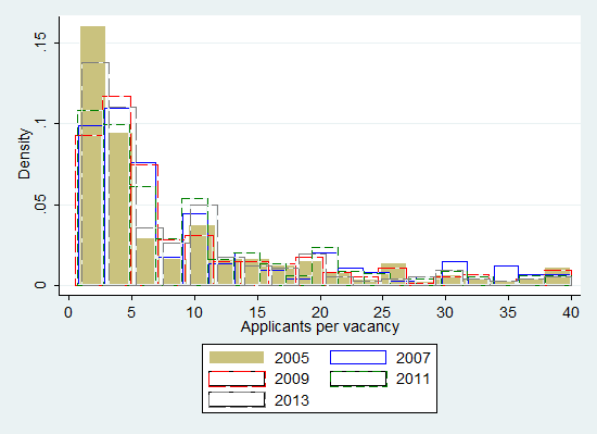
the presence of other nationwide trends unrelated to this study's central thesis.




a. Industry & nationwide income real growth rate (%)




b. National unemployment rate (%)




c. Applicants per vacancy, distribution by year

**Figure 1.** Real growth rates of industry gross incomes, and unemployment rate (%), 2003-2013

Notes: Industry gross incomes are inflation-corrected using midyear industry PPI.

Source: Bank of Korea ECOS.

Contents of the HCCP are also adequate for assessing firms' promotion standards and observed practices.⑨ To proxy for the characteristics of firms' promotion standards, this study will use indicators for the consideration of achievements, performance of job duties, certifications and colleague ratings in promotions; and official and actual rating standards for promotion. To represent firms' promotion practices, this study will assess the typical years to promotion among regular staff and among management; count of advancement steps within the two ranks of firms' workforce; fraction of promotions based on special merit; and the scale and composition of promotions by worker level and by gender (available for a single year). These complementary decision variables serve as alternative dependent variables for the following regressions, whose results can be interpreted in tandem to shed light on the firms' promotion systems at large. The next section reports on preliminary graphical examination of these variables in Figures 2-5, and discusses selected patterns in the variables in detail.

The main explanatory variables related to Hypotheses 3-3a are the industry income growth rate, an indicator for the primary (versus secondary) sector of the labor market, and their interaction term. Secular nationwide tendencies in relation to Hypothesis 2 are controlled for using linear and quadratic time trends. Variables in the HCCP dataset contributing to explaining the dependent variables include: size and structure of the HR department; existence of a personnel committee on firm's board; worker unionization and affiliation with a hardline Korean Confederation of Trade Unions (*Minju Nochong*); firm's organizational structure; indicators for the professional nature of management and for foreign management; size of workforce; and industry group (manufacturing, energy, finance, ICT, other services, and other industries; henceforth referred to as industry). Table 1 reports the definition of variables used in estimation, their units and summary statistics.

Data on producer price indexes and on nominal industry gross income come from the Bank of Korea Economic Statistics System (ECOS). Nominal industry gross income is deflated using industry-specific producer price indexes to approximate the effective performance of the industry relative to the underlying costs, and in comparison to surrounding years (rather than to other industries only). Other monetary variables, being subject to less variation over time and more economically-meaningful variation across industries, are deflated using national producer price index to facilitate comparison across industries and years.

⑨ HCCP has been used in prior studies to study firms' recruiting and turnover trends [32,33].

**Table 1.** Definition of Variables Used in Regressions

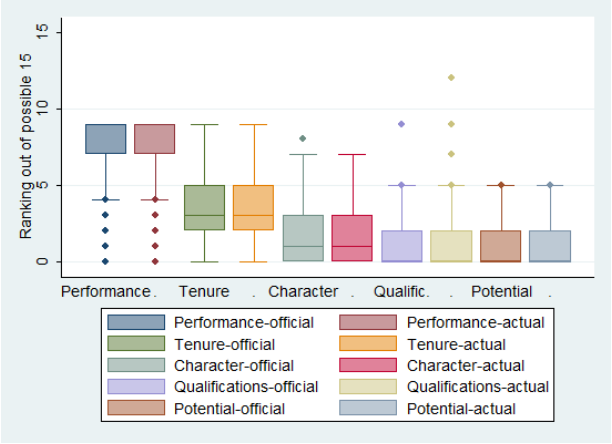
| Variable Name | Definition [Units] | Avg.[i] | St.Dev. | Min.-Max. | N |
|---|---|---|---|---|---|
| Achievement analysis | Consideration of achievements in promotion decisions [binary] | 0.307 | 0.461 | 0-1 | 2,089 |
| Feedback analysis | Consideration of performance of job duties using worker "feedback" for promotions [binary] | 0.947 | 0.225 | 0-1 | 3,182 |
| Certificates analysis | Consideration of educational-training certificates for promotions [binary] | 0.656 | 0.475 | 0-1 | 1,552 |
| Colleague ratings | Consideration of ratings for promotions [binary] | 0.774 | 0.418 | 0-1 | 797 |
| Merit promotions | Percent of promotions based on special merit [%] | 4.811 | 8.882 | 0-100 | 3,285 |
| Reg. staff rank steps | Advancement steps in regular staff rank [count] | 5.690 | 1.246 | 1-11 | 3,290 |
| Mgmt. rank steps | Advancement steps in management rank [count] | 4.400 | 1.515 | 1-15 | 3,290 |
| Years to 1st promotion | Years to promotion from staff to jr. manager [years] | 7.875 | 2.092 | 2-18 | 3,284 |
| Years to 2nd promotion | Years to promotion from jr. to manager [years] | 7.716 | 2.815 | 2-25 | 3,119 |
| Years to 3rd promotion | Years to promotion from manager to sr. mngr. [years] | 5.880 | 2.636 | 2-25 | 3,022 |
| Performance rating[ii] | Actual rank of performance & effort among top 5 criteria in promotion rating standard: +5 for top criterion,…,+1 for 5th top criterion, 2005 [index 0-9] | 7.879 | 1.833 | 0-9 | 454 |
| Potential contrib. rating | Actual rank of specialty skills & subjective potential among top 5 criteria, 2005 [index 0-9] | 0.896 | 1.297 | 0-5 | 454 |
| Qualifications rating | Actual rank of prior career, education & certification among top 5 criteria, 2005 [index 0-12] | 0.894 | 1.458 | 0-12 | 454 |
| Seniority rating | Actual rank of tenure with firm & in position among top 5 criteria, 2005 [index 0-9] | 3.344 | 2.367 | 0-9 | 454 |
| Character eval. rating | Actual rank of integrity, recommendations, teamwork, appearance & other factors among top 5 criteria, 2005 [index 0-15] | 1.738 | 1.666 | 0-7 | 454 |
| Client rating | Importance within colleague ratings, 2005 [%] | 4.918 | 8.362 | 0-25 | 115 |
| Supervisor rating | Importance within colleague ratings, 2005 [%] | 43.801 | 21.308 | 0-100 | 115 |
| Coworker rating | Importance within colleague ratings, 2005, 2007 [%] | 10.392 | 14.746 | 0-80 | 261 |
| Subordinate rating | Importance within colleague ratings, 2005, 2007 [%] | 10.540 | 15.163 | 0-100 | 261 |
| Other rating | Importance within colleague ratings, 2005, 2007 [%] | 2.502 | 8.136 | 0-50 | 261 |
| HR department | Firm has a dedicated HR department [binary] | 0.663 | 0.473 | 0-1 | 3,290 |
| HR department size | Staff in HR department [count] | 6.532 | 11.579 | 0-220 | 3,280 |
| HR functional differentiation | HR dept. structured into teams [1=1 joint team; 2=2 teams; 3=3 separate HRM, HRD, ind. relation teams] | 1.528 | 0.608 | 1-3 | 2,997 |
| Personnel committee | Board of directors includes prsnl. committee [binary] | 0.647 | 0.478 | 0-1 | 2,450 |
| Professional management | Level of professionalism of mgmt. [1=single owner; …; 4=professional mgmt. w/o owner intervention] | 2.173 | 1.206 | 1-4 | 3,290 |
| Unionization of workers | Workers are organized in a union [1], or have a labor council [0.5], or none [0] | 0.638 | 0.367 | 0-1 | 3,290 |
| Industry group | Binary indicators (manufacturing 51%, energy 8%, finance 7%, ICT 9%, other services 14%, other 11%) | - | - | - | 3,290 |
| Industry income growth | Year-on-year real growth in ind. gross income [%] | 4.138 | 2.630 | –5.39-8.75 | 3,290 |
| Total workforce | Firm workers [count/1,000] | 0.841 | 2.042 | 0.009-34.12 | 3,290 |
| Applicants/vacancy | [ratio of counts] | 28.631 | 85.457 | 0.5-1866.7 | 2,355 |
| Starting annual salary | [mil. Won] | 23.305 | 5.607 | 9.57-47.85 | 2,355 |
| Fringe benefits/worker | Firm annual expenditure per worker [mil. Won] | 4.862 | 4.934 | 0.011-65.07 | 2,355 |

Data sources: HCCP; midyear producer price indexes and industry gross incomes from Bank of Korea ECOS.

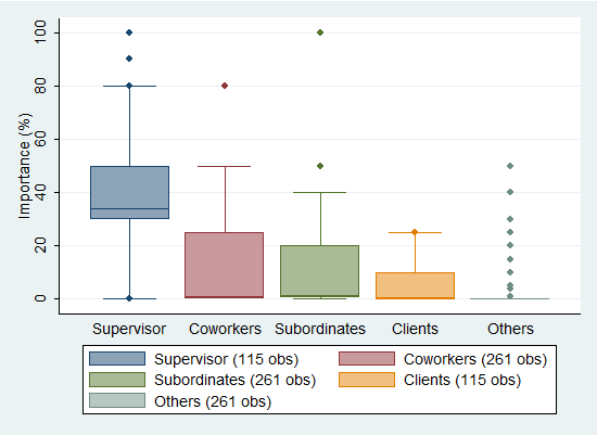
[i] Evaluated in an unbalanced panel of 3,290 observations, 687 firms and 5 time periods (or fewer, depending on availability of each variable) for which the dependent and main explanatory variables are available, and which appear in benchmark regressions. All variables are available in all 5 survey waves except as noted in their definition. Monetary variables are deflated using national PPI, except for industry income growth - deflated using industry PPI.

ii In addition to actual ranks, official ranks are evaluated (refer to Figure 2b). Their means & standard deviations are within 0.15 of those of actual ranks.


a. Criteria in promotion decisions (1 when used)



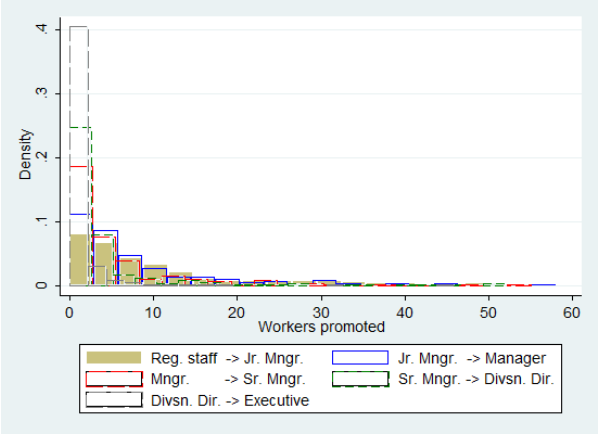

b. Importance of various rating standards (2005)



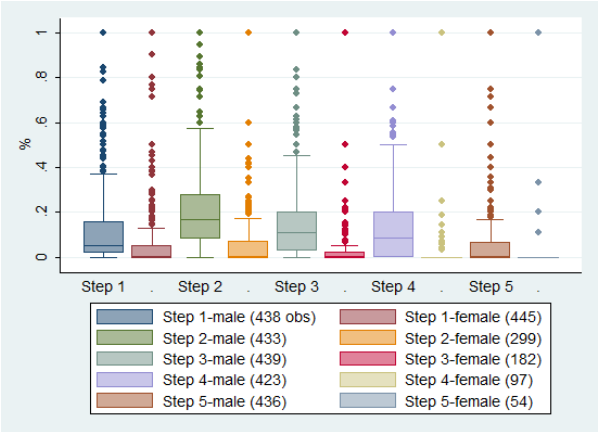

c. Importance of rating, by rater (2005)

**Figure 2.** Criteria and rating standards in promotion decisions

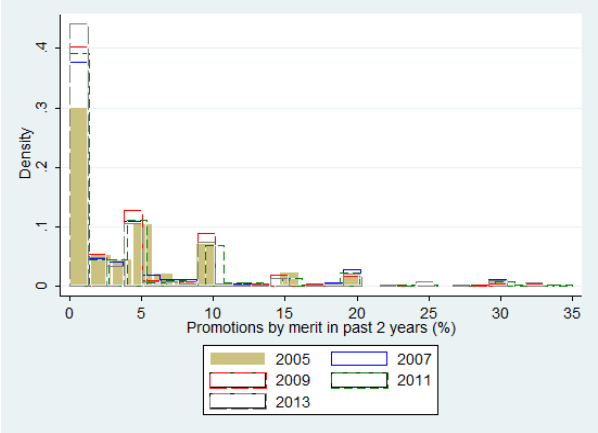
Note: In panel (a), "feedback analysis" is understood to refer to analysis of job-content performance of job duties using workers' own input (e.g., annual reports).




a. Distribution of workers promoted in a year (2005)



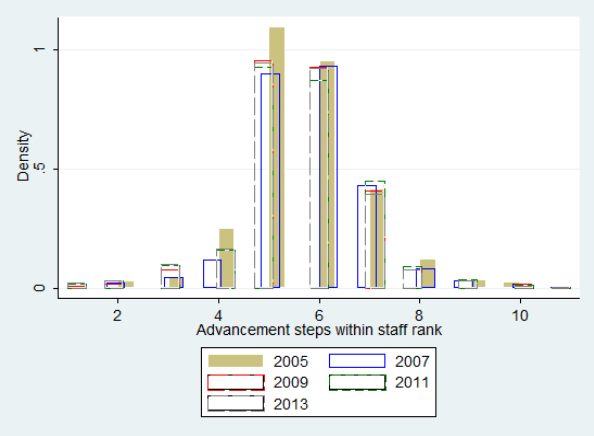

b. Gender composition of promotions (2005)



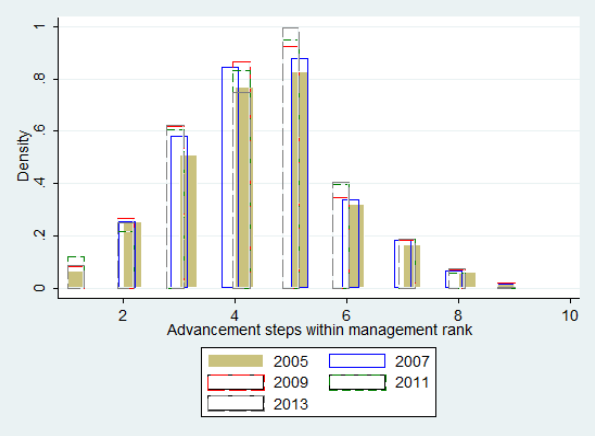

c. Distribution of promotions by special merit in past 2 years (%), by year

**Figure 3.** Composition of observed promotions

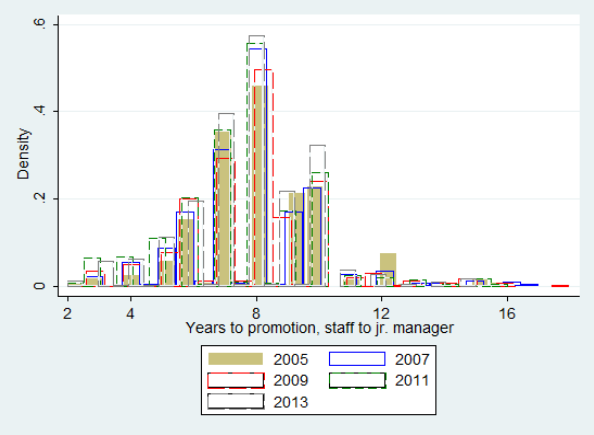
Note: In panel (a), values over 60 (26, 25, 16, 8, 1 out of 448 observations, respectively) are omitted for clarity of presentation. In panel (c), values over 35 (8-12 out of 622-732 observations in each year, respectively) are omitted for clarity of presentation.



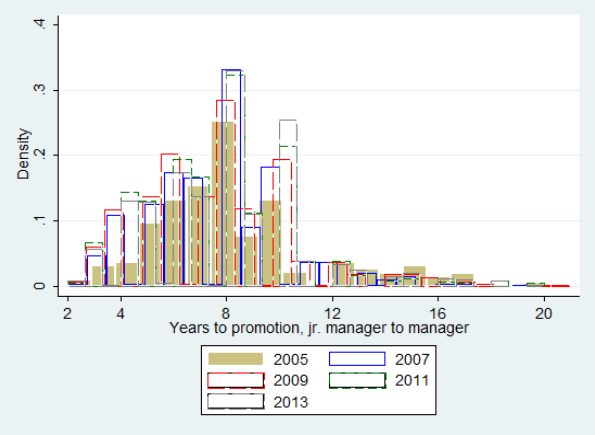

a. Count of steps within regular-staff rank



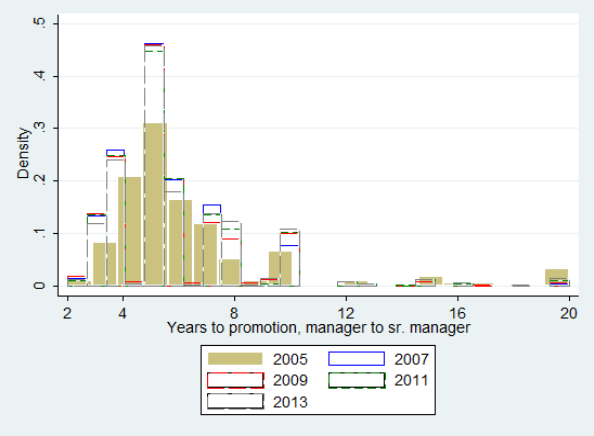

b. Count of steps within management rank




c. Typical years to promotion: staff to junior manager

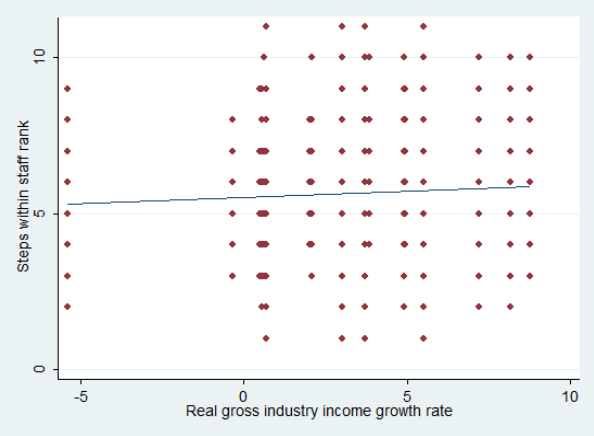



d. Years to promotion: junior manager to manager

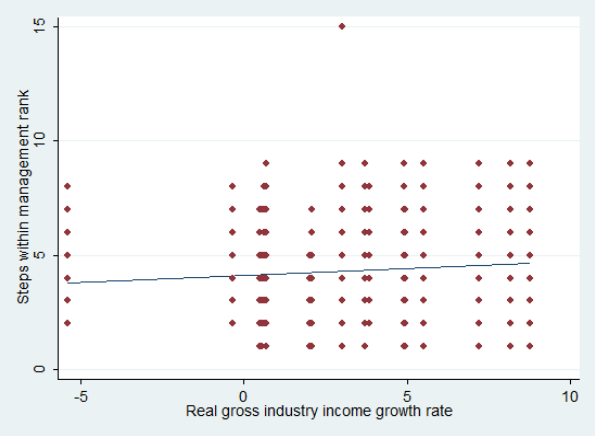



e. Years to promotion: manager to senior manager

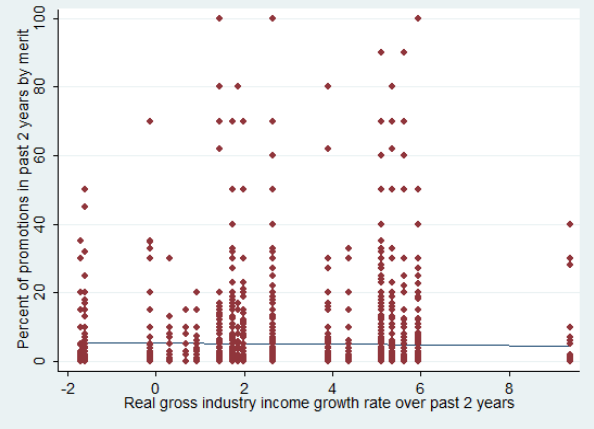
**Figure 4.** Count of advancement steps and years to promotion within employment ranks, by year



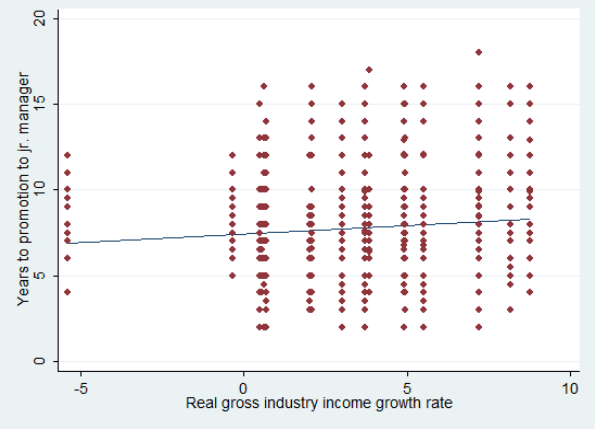

a. Count of steps within regular staff rank



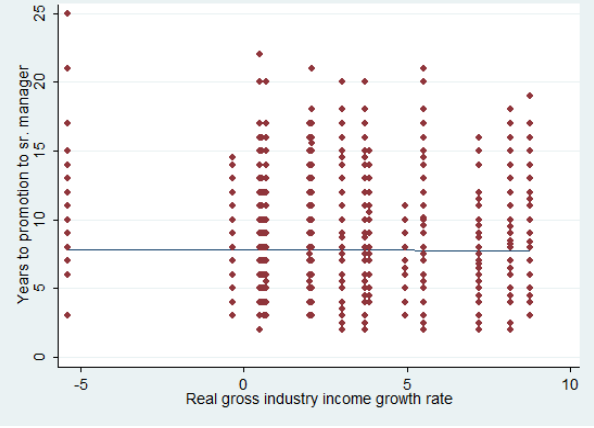

b. Count of steps within management rank



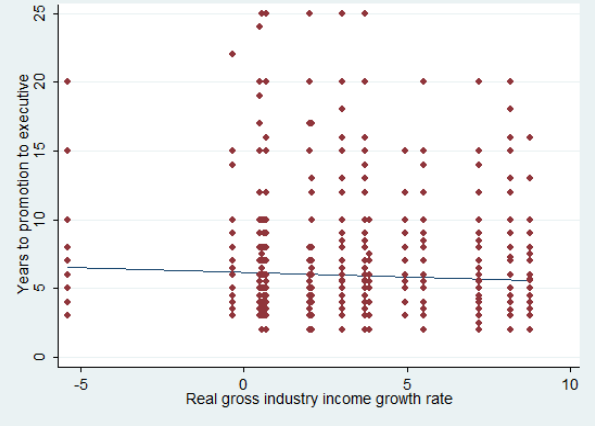

c. Promotions by special merit over past 2 years (%)




d. Typical years to promotion to junior manager




e. Typical years to promotion to manager




f. Typical years to promotion to senior manager

**Figure 5.** Count of advancement steps and promotion dynamics across the business cycle

Note: In panel (c), promotions by special merit, and annual industry income growth rate are evaluated over the past 2 years. Industry income growth rate is inflation-corrected using midyear industry PPI.

### 3.3 Preliminary Review of Data

Initial examination of the HCCP data shows various patterns across firms' promotion standards and practices. With respect to firms' self-reported promotion decisions, they are based on the analysis of workers' job content, effort and performance at job duties considering even workers' own input ("feedback analysis"), colleague ratings and workers' seniority, and to a lesser degree on workers' certifications and analysis of their past achievements.[10] Ratings by supervisors are given much greater weight than ratings by other employees, clients or other stakeholders. Refer to Figure 2.

Even when we cannot assess these promotion standards over time - because some are available for the first wave only - and we thus cannot use them in panel-data regressions, we can contrast their distribution across different types of firms - firms with different propensity to be operating in the primary sector.

With respect to actual promotion practices, Korean firms promote on average 11.7% of regular staff annually to junior-management positions (which works out to be between 1 and 40 workers in most firms), 20.6% of junior managers to managers, 15.3% of those to senior managers, 14.5% of those to division directors, and 6.7% of those to executive positions. Promotions are awarded to men much more frequently than to women, particularly at higher ranks. While 86% of promotions from regular staff to junior managers were awarded to men, this percentage was 93%, 96%, 98% and 98% for higher-level promotions, respectively. The fraction of specially selected merit-based promotions is between 0 and 20% of promotions. Refer to Figure 3.

Table 1 and Table 2 report that as little as 30.7% of firms rely on workers' objective individual achievements in the promotion determination, while as many as 94.7% consider workers' performance of their core job duties relying on workers' own subjective feedback, and 77.4% consider colleague ratings (in 2005). These patterns reflect the traditionally heavy focus on subjective (self-) assessments as a means to promote workplace harmony. These promotion standards and practices undergo gradual changes over time and across individual stages of industry business cycles, but the trends do not entirely agree with our expectations from existing literature. Figure 2 shows that the consideration of achievements in promotion decisions has stagnated in prevalence (at 31% of firms), consideration of certifications has slightly decreased in prevalence (68% to 65% of firms), while the consideration of subjective ratings by colleagues has slightly increased in prevalence (from 81% of firms in 2007 to 84% in 2013). Figure 3c shows that the fraction of promotions by special merit has fallen over time (from 6.1% on average in 2005 to 4.5% in 2013), while Figure 4 suggests that the number of advancement steps and years to promotion have been stagnating at firms' regular-staff ranks, and slightly falling among management ranks.Across business cycles in firms' industries, the count of advancement steps appears to be rising with the state of the economy, a surprising finding. One possible explanation is that increased hiring in expansionary years requires multiplying of advancement steps into which workers can be placed without having to promote them. Typical years to promotion of regular staff also appear to rise during expansions, while the years to promotion of junior managers fall slightly, and the years to promotion of managers fall notably. At face value, these patterns would suggest that the distribution of workers within organizations widens during economic expansions, with more workers remaining in regular staff rank and more managers promoted to mid- and senior management. As firms hire more regular staff during expansionary years, regular staffers' years to promotion to a limited number of managerial positions increase on average. At the same time, as the opportunities for business expansion improve, firms increase the number of managers and senior managers, streamlining promotions to those positions.

⑩ Firms report the top five criteria that enter their promotion decisions. This includes job performance, effort, worker's potential, tenure in the position, tenure with the firm, education, specialty skills, career background, certification, integrity, teamwork, supervisor recommendations, appearance, and other considerations. Finally, relevance of the firms' official promotion policy is assessed through the comparison of the official versus actual rating standards, both surveyed in the HCCP. Figure 2b shows the top five criterion-groups used in promotion decisions, from among 14 individual criteria surveyed in the HCCP. To operationalize this analysis, the 14 worker-rating criteria were sorted into 5 categories by content: observed productivity (job performance, effort), qualifications (prior career, certification, education), potential contribution (subjective potential, specialty skills), seniority (position tenure, firm tenure), and subjective evaluation of character (integrity, recommendations, teamwork, appearance, others). This categorization is validated by the observed trends of joint prevalence of intra-group versus between-group criteria in each firm's rating system.

Next we assign a value to each category using the ranking of all criteria in the category in the firm's rating system, with higher values representing greater reported importance of the category in the firm's rating: +5 is assigned if one of the criteria is reported as the most important in the rating, +4 if another criterion from the category is the 2nd most important, …, nd +1 if another criterion is the 5th most important. Thus, "observed productivity", "potential contribution" and "seniority", categories can take any value between 0 and 9. "Qualifications" can take values between 0 and 12. "Subjective evaluation of character" can theoretically take values up to 15, if the top five reported criteria all come from this category (i.e., 5+4+3+2+1). The sum of their values is 15 for each firm. For instance, a firm reporting the top rating criteria as "effort, specialty skills, potential, teamwork and integrity", may have a value of "observed productivity" at 5, "qualifications" at 0, "potential contribution" at 7, "seniority" at 0 and "subjective evaluation" at 3.

### 3.4 Classification of Firms into Primary vs. Secondary Labor-market Sectors

An important analytical task is to delineate the boundary between primary and secondary labor-market sectors, and to infer which sector each firm effectively operates in. The HCCP does not include any indicator of this classification or status. Since the survey is anonymous, we also cannot use real-world observation to classify firms. Clear-cut classification is further hampered by the fact that firms that can be classified most clearly into either sector - the largest and most renown holding companies (*chaebol*) on the one hand, or the smallest firms and firms in marginal industries on the other hand - are excluded from the survey (to guarantee anonymity, and to ensure high degree of successful resampling across years).

The approach taken in this study is to infer firms' likelihood of belonging to the primary sector via linear principal component analysis [34]. This involves the spectral decomposition of the correlation matrix of source variables, and the identification of leading characteristic vectors - the principal components - which are linear combinations of the set of variables that contain the most of all variance in the source variables. This method is robust to differences in units and distributions across the source variables. Only the first principal component is retained as a single vector proxying for the primary sector of the economy. With the first principal component identified, we can compute the portion of the total variance in the source variables that it explains, and the loadings of individual variables in it. Finally, regression scores from the first principal component, standardized to be in the unit interval, are used as the primary-sector indicator for each firm-year observation [35]. Normalization to the unit interval aids in interpreting regression results - a unit increase in the variable may be interpreted as the difference between a firm highly likely to be in the secondary sector and a firm highly likely to be in the primary sector. A 0.1 increase may be interpreted as a 10 percentage-point increase in the probability that a firm operates in the primary sector. With interaction terms, considering the (counterfactual) values of the primary-sector score of 0 and 1 tells us the expected premium in the effect of the interacted variable for clearly primary-sector employers relative to clearly secondary-sector employers.

Four relevant observable variables were used in the principal component analysis in view of their conceptual importance: starting salary, fringe benefits, firms' workforce, and the count of applicants per vacancy. There are various reasons to expect that primary-sector employers offer significantly more generous salaries and other benefits, are larger, and attract greater pools of applicants for each vacancy. These variables can be thought of as effectively embodying the distinction between primary and secondary sectors.[11][12]

Performing the principal component analysis of the four variables, the first principal component explains 39.36% (s.e. 0.81) of the total variance in them. Variable loadings in this first principal component are 0.630 for starting salary, 0.462 for fringe benefits, 0.523 for firm workforce, and 0.341 for applicants per vacancy.[13]

The resulting scores - standardized to be in the unit interval - have a mean of 0.20, median of 0.17, and standard deviation of 0.11 - their distribution is slightly right-skewed with a relatively low mean, corresponding to the distribution of the variables used in deriving it. (Refer to Figure 6.)

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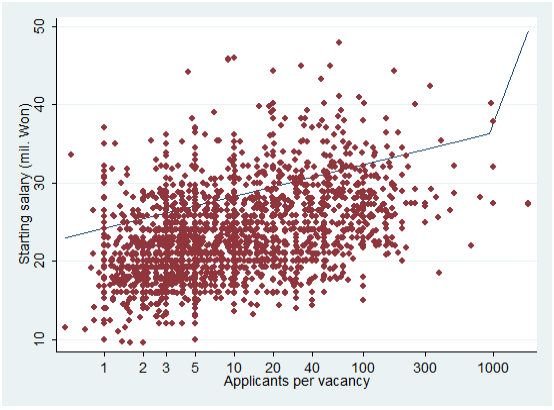
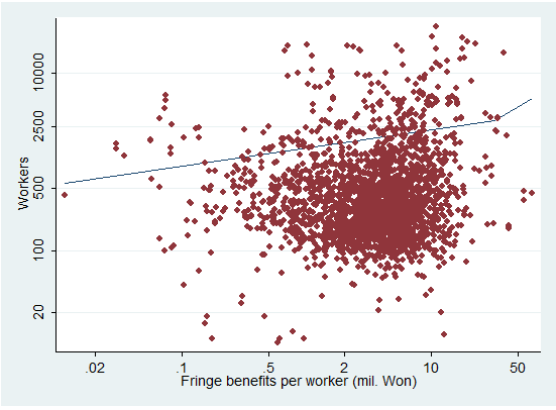
⑪ The resulting index was assessed using several validation tests. The Kaiser-Meyer-Olkin measure of sampling adequacy, evaluating the proportion of variance among variables common to them, exceeds the critical value of 0.60. The set of firm characteristics is thus adequate to perform the principal component analysis. The Bartlett test of sphericity, determining whether the correlation matrix used for factor analysis is an identity matrix, rejects the null hypothesis of zero correlation across the variables, implying that variable correlations are not due to sampling error, and justifying the use of these variables. The factor loadings have the expected ordering across firm characteristics in relation to the concept of sector classification. These findings jointly validate the construction of the sector-classification index.

⑫ Alternatively, we could solely use the information on applicants per vacancy, as workers' truthful revealed preferences for jobs across different firms (albeit reported by firms). A natural break appears to occur at 5 applications per vacancy in all years of analysis. Below 5, the frequency of values is at one level, and above 5 it is at a different level. At 5, there is a spike of occurrences, and incidentally 5 appears to split the data approximately in half across all years, which is favorable from the point of view of robustness of empirical estimates on both sides of the split. Refer to Figure 1c. Thus, employers with more than 5 applicants per vacancy may be labeled as "primary-sector" employers, while employers with five or fewer applicants may be labeled as "secondary-sector" employers. The problem with this is that the split is arbitrary, and moreover assigns too many firms to the elite primary sector.
For observations where some of the component variables are missing, the scores were filled in using values from surrounding years, under the argument that firms' position in the overall labor market changes only slowly. This appears justified empirically, as the correlation in firms' scores across pairs of adjacent years is 0.83-0.92. This extrapolation increases the effective sample size from 2,355 to 3,296.

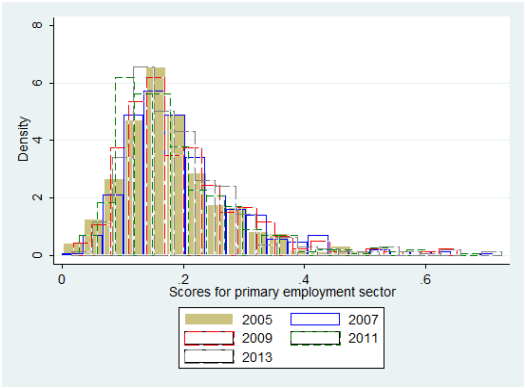
⑬ The second principal component would explain an additional 24.01% of the variance. Considering only the first principal component, the sums of squares of the individual-variable loadings in the deleted components, weighted by the associated eigenvalues, are approximately 38-82%, 61% on average. These statistics suggest that




a. Applicants per vacancy vs. starting salary




b. Fringe benefits per worker vs. workforce




c. Scores for primary employment sector, distribution by year

**Figure 6.** Applicants per vacancy, starting salary, fringe benefits, firm work force and score for primary sector

Notes: Fitted lines are estimated for variables in levels. In (a), values over 40 (375 out of 2,355 observations) are omitted for clarity of presentation. *x*-axes in (b) and (c) and *y*-axis in (c) use logarithmic scale. In (d), firms' regression scores come from the principal components in a factor analysis of firm workforce, starting salary, fringe benefits and applicants/vacancy. Scores were standardized to be in the unit interval. Values over 0.75 (9 out of 2,355 observations) are omitted for clarity. Fringe benefits and starting salaries are deflated by national PPI.

## 4. Findings

Tables 2-5 present the main regression results. Table 2 reports on the linear-probability models of firms' criteria for firms' promotion decisions - specifically the consideration of achievements, job content "feedback", certifications, and colleague ratings - accounting for economic performance of firms' industry, and for firms' likelihood of operation in the primary economic sector. Table 3 reports on the corresponding regressions of firms' observed promotion practices - namely the number of advancement steps before promotion to a higher rank, typical years to promotion, and percent of promotions by special merit. Tables 4 and 5 further control for interaction terms of the primary-sector indicator with the business-cycle phase indicator, and of the primary-sector indicator with the year indicator, to allow for differential time trend and cyclicality between the primary and the secondary sector firms. Results in all tables are reported in pairs of two regressions - a basic model controlling only for the variables of interest, firm workforce, unionization and year indicators; and a fuller model controlling additionally for firms' management and HRM institutions.

Overall, results in Tables 2 and 4 (and Tables 3 and 5) are analogous qualitatively and very similar even qualitatively, so they will be discussed only once to preserve space. Results of the basic and fuller model specifications (i.e., adjacent odd and even columns) are also very similar. These findings suggest that the results are quite robust to the addition of more variables as well as to the exact delineation of the sample - when variables are added to the regressions, sample size often falls substantially because of missing values in these variables.

**Table 2.** Results of linear probability model regressions of criteria in firms' promotion decisions

| | Achievement analysis | | "Feedback" analysis | | Certifications | | Colleague ratings | |
|---|---|---|---|---|---|---|---|---|
| Real growth rate | –0.001 | –0.002 | 0.001 | 0.001 | –0.002 | –0.001 | 0.012** | 0.012* |
| | (.004) | (0.005) | (0.001) | (0.001) | (0.003) | (0.004) | (0.006) | (0.007) |
| Primary sector | –0.218 | –0.322** | 0.090* | 0.002 | 0.141 | 0.080 | –0.401** | –0.163 |
| | (0.142) | (0.157) | (0.054) | (0.047) | (0.132) | (0.133) | (0.180) | (0.239) |
| Total workforce | 0.003 | 0.000 | 0.000 | 0.002 | 0.001 | 0.005 | 0.011* | 0.006 |
| | (0.010) | (0.013) | (0.001) | (0.002) | (0.008) | (0.006) | (0.006) | (0.011) |
| Unionization | 0.001 | –0.018 | 0.057*** | 0.045** | –0.041 | –0.005 | –0.056 | –0.074 |
| | (0.046) | (0.060) | (0.023) | (0.022) | (0.049) | (0.055) | (0.052) | (0.067) |
| Year | –0.017 | –0.012 | –0.006 | –0.001 | 0.014 | –0.006 | 0.133*** | 0.183*** |
| | (0.014) | (0.021) | (0.005) | (0.006) | (0.010) | (0.017) | (0.043) | (0.050) |
| $Year^2$ | 0.004 | 0.005 | 0.002 | 0.000 | –0.002 | 0.002 | –0.022** | –0.033*** |
| | (0.003) | (0.004) | (0.001) | (0.002) | (0.003) | (0.004) | (0.009) | (0.011) |
| HR-department | | –0.016 | | 0.020** | | 0.049** | | –0.023 |
| | | (0.029) | | (0.010) | | (0.025) | | (0.047) |
| HR-dept. size | | 0.001 | | 0.000 | | 0.000 | | 0.000 |
| | | (0.002) | | 0.000 | | (0.001) | | (0.001) |
| HRM teams | | –0.013 | | –0.003 | | –0.018 | | 0.001 |
| | | (0.025) | | (0.009) | | (0.024) | | (0.027) |
| Personnel comm. | | –0.006 | | –0.011 | | 0.035 | | 0.013 |
| | | (0.030) | | (0.009) | | (0.023) | | (0.046) |
| Professnl. mgmt. | | 0.003 | | –0.003 | | –0.015 | | –0.001 |
| | | (0.015) | | (0.004) | | (0.014) | | (0.018) |
| Constant | 0.359*** | 0.414*** | 0.885*** | 0.935*** | 0.640*** | 0.635*** | 0.703*** | 0.630*** |
| | (0.046) | (0.080) | (0.023) | (0.023) | (0.051) | (0.074) | (0.060) | (0.093) |
| Observations | 2,065 | 1,315 | 3,187 | 2,023 | 1,542 | 1,021 | 780 | 582 |
| Number of firms | 451 | 281 | 667 | 414 | 345 | 222 | 346 | 227 |
| Within R-squared | 0.001 | 0.004 | 0.007 | 0.007 | 0.004 | 0.013 | 0.051 | 0.078 |
| Overall R-squared | 0.014 | 0.015 | 0.013 | 0.015 | 0.005 | 0.008 | 0.058 | 0.062 |
| ρ (Fraction of error var. due to FE) | 0.660 | 0.562 | 0.732 | 0.610 | 0.805 | 0.783 | 0.250 | 0.287 |

Notes: Dependent variables are binary indicators for the consideration of each factor in promotion decisions. Regressions can thus be interpreted as linear probability models, with constant marginal effects of explanatory variables on *Pr(y=1)*. Fixed effects at the firm level are used. The reference group of firms is the micro and small enterprises in the secondary sector, without labor unions, and without structured HR departments. Standard errors corrected for arbitrary heteroskedasticity and autocorrelation are in parentheses. Coefficients are significant at 1% (***); 5% (**); 10% (*) level, two-sided *t* test.

**Table 3.** Results of regressions of firms' observed promotion practices

| | % of promotions by special merit | | Advancement steps, regular staff | | Advancement steps, management | | Years to promotion, reg. staff to jr. mngr. | | Years to promotion, jr. mngr. to manager | | Years to promotion, manager to sr. mngr. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Real growth rate | 0.009 | 0.024 | 0.017** | 0.019** | 0.003 | 0.005 | 0.029*** | 0.029** | –0.034* | –0.035 | –0.067*** | –0.073*** |
| | (0.063) | (0.079) | (0.008) | (0.010) | (0.005) | (0.006) | (0.011) | (0.014) | (0.021) | (0.027) | (0.023) | (0.028) |
| Primary sector | 4.099* | 5.592** | 0.175 | 0.418 | 1.248*** | 0.711* | 1.163* | 1.174* | 4.995*** | 4.536*** | 0.900 | 1.317* |
| | (2.540) | (2.787) | (0.400) | (0.421) | (0.441) | (0.398) | (0.646) | (0.711) | (0.963) | (1.128) | (0.731) | (0.810) |
| Total workforce | –0.164 | –0.404*** | –0.029* | –0.047** | 0.009 | 0.029 | 0.001 | –0.009 | 0.054 | 0.035 | –0.019 | –0.010 |
| | (0.113) | (0.145) | (0.016) | (0.022) | (0.021) | (0.023) | (0.032) | (0.041) | (0.047) | (0.057) | (0.034) | (0.044) |
| Unionization | –2.893*** | –4.079*** | 0.141 | 0.160 | 0.313*** | 0.277*** | 0.780*** | 0.967*** | 0.653*** | 0.785*** | 0.335 | 0.648** |
| | (0.865) | (1.142) | (0.096) | (0.107) | (0.101) | (0.111) | (0.180) | (0.224) | (0.225) | (0.274) | (0.248) | (0.324) |
| Year | –0.931*** | –1.246*** | 0.059 | 0.022 | –0.038** | –0.054* | –0.215*** | –0.170** | –0.626*** | –0.512*** | –0.693*** | –0.613*** |
| | (0.366) | (0.456) | (0.039) | (0.053) | (0.019) | (0.030) | (0.054) | (0.081) | (0.124) | (0.151) | (0.140) | (0.160) |
| $Year^2$ | 0.131* | 0.184* | –0.020** | –0.014 | 0.012* | 0.018** | 0.036*** | 0.022 | 0.122*** | 0.094*** | 0.138*** | 0.118*** |
| | (0.080) | (0.106) | (0.009) | (0.012) | (0.006) | (0.009) | (0.012) | (0.018) | (0.026) | (0.031) | (0.027) | (0.031) |
| HR-department | | 0.686 | | 0.059 | | 0.051 | | –0.193* | | –0.087 | | –0.092 |
| | | (0.516) | | (0.076) | | (0.049) | | (0.105) | | (0.173) | | (0.157) |
| HR-dept. size | | 0.055*** | | 0.003 | | –0.004* | | 0.004 | | 0.004 | | 0.000 |
| | | (0.018) | | (0.003) | | (0.002) | | (0.004) | | (0.007) | | (0.005) |
| HRM teams | | –0.189 | | –0.111** | | –0.034 | | –0.024 | | –0.107 | | –0.210* |
| | | (0.309) | | (0.049) | | (0.044) | | (0.078) | | (0.114) | | (0.116) |
| Personnel comm. | | –1.061* | | –0.117 | | 0.102*** | | –0.106 | | –0.224 | | –0.251 |
| | | (0.579) | | (0.085) | | (0.039) | | (0.135) | | (0.190) | | (0.206) |
| Professnl. mgmt. | | –0.331 | | –0.102*** | | –0.043* | | –0.053 | | 0.056 | | –0.132* |
| | | (0.231) | | (0.033) | | (0.024) | | (0.052) | | (0.078) | | (0.082) |
| Constant | 7.091*** | 9.176*** | 5.515*** | 5.946*** | 3.948*** | 4.274*** | 7.246*** | 7.457*** | 7.007*** | 7.339*** | 6.419*** | 6.846*** |
| | (0.766) | (10.323) | (0.095) | (0.147) | (0.103) | (0.144) | (0.166) | (0.285) | (0.260) | (0.400) | (0.284) | (0.420) |
| Observations | 3,285 | 2,040 | 3,290 | 2,040 | 3,290 | 2,040 | 3,289 | 2,035 | 3,123 | 1,992 | 3,022 | 1,949 |
| Number of firms | 685 | 417 | 686 | 417 | 686 | 417 | 686 | 416 | 687 | 417 | 673 | 414 |
| Within R-squared | 0.013 | 0.025 | 0.006 | 0.025 | 0.005 | 0.009 | 0.017 | 0.019 | 0.009 | 0.009 | 0.029 | 0.037 |
| Overall R-squared | 0.020 | 0.047 | 0.018 | 0.025 | 0.054 | 0.059 | 0.053 | 0.081 | 0.110 | 0.110 | 0.017 | 0.021 |
| ρ (Error var. frac. due to FE) | 0.353 | 0.288 | 0.560 | 0.479 | 0.796 | 0.806 | 0.668 | 0.567 | 0.423 | 0.335 | 0.478 | 0.479 |

Notes: Fixed effects at the firm level are used. Standard errors corrected for arbitrary heteroskedasticity and autocorrelation are in parentheses. Coefficients are significant at 1% (***); 5% (**); 10% (*) level, two-sided *t* test.

**Table 4.** Results of linear probability model regressions of criteria in firms' promotion decisions, with primary-sector interaction terms

| | Achievement analysis | | "Feedback" analysis | | Certifications | | Colleague ratings | |
|---|---|---|---|---|---|---|---|---|
| Real growth rate | 0.008 | 0.012 | 0.002 | 0.000 | 0.006 | 0.008 | –0.011 | –0.010 |
| | (0.006) | (0.009) | (0.002) | (0.003) | (0.007) | (0.008) | (0.009) | (0.011) |
| Primary sector | –0.488** | –0.623** | 0.177*** | 0.071 | 0.103 | –0.024 | –1.002*** | –0.839*** |
| | (0.245) | (0.274) | (0.069) | (0.070) | (0.171) | (0.195) | (0.275) | (0.312) |
| Growth×Primary | –0.048* | –0.069** | 0.000 | 0.002 | –0.035 | –0.043* | 0.088*** | 0.077** |
| | (0.026) | (0.032) | (0.008) | (0.009) | (0.024) | (0.026) | (0.029) | (0.033) |
| Total workforce | 0.004 | –0.003 | 0.001 | 0.003 | 0.002 | 0.003 | 0.010 | 0.005 |
| | (0.010) | (0.012) | (0.002) | (0.002) | (0.006) | (0.006) | (0.007) | (0.011) |
| Unionization | 0.008 | –0.014 | 0.055** | 0.044** | –0.039 | –0.006 | –0.044 | –0.055 |
| | (0.046) | (0.060) | (0.023) | (0.022) | (0.049) | (0.055) | (0.052) | (0.067) |
| Year | –0.045*** | –0.052** | 0.000 | 0.005 | 0.004 | –0.026 | 0.099** | 0.128** |
| | (0.018) | (0.024) | (0.006) | (0.007) | (0.013) | (0.019) | (0.045) | (0.053) |
| $Year^2$ | 0.002 | 0.002 | 0.002 | 0.000 | –0.003 | 0.001 | –0.021** | –0.033*** |
| | (0.003) | (0.005) | (0.001) | (0.002) | (0.003) | (0.005) | (0.009) | (0.011) |
| Year×Primary | 0.182*** | 0.227*** | –0.037** | –0.033 | 0.070 | 0.104* | 0.127* | 0.212** |
| | (0.071) | (0.076) | (0.019) | (0.023) | (0.054) | (0.065) | (0.077) | (0.091) |
| HR-department | | –0.007 | | 0.019* | | 0.056** | | –0.024 |
| | | (0.029) | | (0.010) | | (0.025) | | (0.046) |
| HR-dept. size | | 0.002 | | 0.000 | | 0.000 | | 0.000 |
| | | (0.002) | | 0.000 | | (0.001) | | (0.002) |
| HRM teams | | 0.007 | | –0.006 | | –0.005 | | 0.010 |
| | | (0.024) | | (0.009) | | (0.022) | | (0.029) |
| Personnel comm. | | –0.008 | | –0.011 | | 0.032 | | 0.017 |
| | | (0.030) | | (0.009) | | (0.023) | | (0.047) |
| Professnl. mgmt. | | 0.001 | | –0.003 | | –0.016 | | 0.000 |
| | | (0.015) | | (0.004) | | (0.014) | | (0.018) |
| Constant | 0.403*** | 0.437*** | 0.869*** | 0.925*** | 0.641*** | 0.635*** | 0.859*** | 0.790*** |
| | (0.060) | (0.094) | (0.026) | (0.027) | (0.058) | (0.081) | (0.074) | (0.100) |
| Observations | 2,065 | 1,315 | 3,187 | 2,023 | 1,542 | 1,021 | 780 | 582 |
| Number of firms | 451 | 281 | 667 | 414 | 345 | 222 | 346 | 227 |
| Within R-squared | 0.015 | 0.023 | 0.009 | 0.009 | 0.010 | 0.024 | 0.077 | 0.107 |
| Overall R-squared | 0.016 | 0.027 | 0.014 | 0.016 | 0.008 | 0.014 | 0.062 | 0.068 |
| ρ (Fraction of error var. due to FE) | 0.665 | 0.569 | 0.733 | 0.611 | 0.805 | 0.784 | 0.261 | 0.297 |

Notes: Dependent variables are binary indicators for the consideration of each factor in promotion decisions. Regressions can thus be interpreted as linear probability models, with constant marginal effects of explanatory variables on *Pr(y=1)*. Fixed effects at the firm level are used. Standard errors corrected for arbitrary heteroskedasticity and autocorrelation are in parentheses. Coefficients are significant at 1% (***); 5% (**); 10% (*) level, two-sided *t* test.

**Table 5.** Results of fully-specified regressions of firms' observed promotion practices, with primary-sector interaction terms

| | % of promotions by special merit | | Advancement steps, regular staff | | Advancement steps, management | | Years to promotion, reg. staff to jr. mngr. | | Years to promotion, jr. mngr. to manager | | Years to promotion, manager to sr. mngr. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Real growth rate | 0.046 | 0.072 | –0.011 | –0.013 | –0.003 | –0.002 | 0.012 | 0.015 | 0.007 | 0.036 | –0.031 | –0.030 |
| | (0.062) | (0.079) | (0.015) | (0.018) | (0.009) | (0.012) | (0.022) | (0.028) | (0.039) | (0.047) | (0.035) | (0.041) |
| Primary sector | 7.885** | 9.102** | –0.962* | –0.879 | 1.437** | 0.895 | 1.478 | 1.428 | 7.457*** | 7.240*** | 2.486* | 3.475** |
| | (3.727) | (4.336) | (0.569) | (0.633) | (0.583) | (0.604) | (0.952) | (1.081) | (1.741) | (1.917) | (1.503) | (1.608) |
| Growth×Primary | –0.264 | –0.308 | 0.136** | 0.142** | 0.032 | 0.036 | 0.091 | 0.068 | –0.195 | –0.315 | –0.174 | –0.191 |
| | (0.235) | (0.239) | (0.064) | (0.070) | (0.042) | (0.050) | (0.099) | (0.111) | (0.209) | (0.223) | (0.166) | (0.176) |
| Total workforce | –0.151 | –0.398*** | –0.037** | –0.049** | 0.009 | 0.031 | 0.001 | –0.008 | 0.064 | 0.039 | –0.011 | –0.004 |
| | (0.110) | (0.142) | (0.017) | (0.022) | (0.023) | (0.023) | (0.032) | (0.040) | (0.046) | (0.056) | (0.034) | (0.045) |
| Unionization | –2.894*** | –4.057*** | 0.154* | 0.172* | 0.309*** | 0.273*** | 0.771*** | 0.965*** | 0.634*** | 0.767*** | 0.323 | 0.633** |
| | (0.865) | (1.140) | (0.094) | (0.106) | (0.101) | (0.110) | (0.180) | (0.224) | (0.225) | (0.272) | (0.248) | (0.324) |
| Year | –0.686* | –0.973** | 0.006 | –0.047 | –0.018 | –0.031 | –0.173*** | –0.133 | –0.485*** | –0.373** | –0.610*** | –0.486*** |
| | (0.398) | (0.461) | (0.045) | (0.064) | (0.024) | (0.034) | (0.062) | (0.095) | (0.134) | (0.165) | (0.146) | (0.167) |
| $Year^2$ | 0.123 | 0.165 | –0.020** | –0.015 | 0.013** | 0.019** | 0.039*** | 0.024 | 0.122*** | 0.096*** | 0.137*** | 0.120*** |
| | (0.081) | (0.110) | (0.009) | (0.012) | (0.006) | (0.009) | (0.012) | (0.018) | (0.026) | (0.032) | (0.027) | (0.031) |
| Year×Primary | –1.231 | –1.060 | 0.274* | 0.337* | –0.130 | –0.133 | –0.282 | –0.218 | –0.740** | –0.668* | –0.399 | –0.629** |
| | (1.034) | (1.221) | (0.144) | (0.178) | (0.116) | (0.131) | (0.201) | (0.261) | (0.363) | (0.411) | (0.305) | (0.321) |
| HR-department | | 0.650 | | 0.073 | | 0.047 | | –0.199* | | –0.112 | | –0.117 |
| | | (0.516) | | (0.076) | | (0.049) | | (0.106) | | (0.172) | | (0.155) |
| HR-dept. size | | 0.057*** | | 0.002 | | –0.004* | | 0.004 | | 0.006 | | 0.002 |
| | | (0.019) | | (0.003) | | (0.002) | | (0.004) | | (0.008) | | (0.006) |
| HRM teams | | –0.246 | | –0.098** | | –0.046 | | –0.044 | | –0.131 | | –0.240** |
| | | (0.336) | | (0.050) | | (0.046) | | (0.081) | | (0.117) | | (0.119) |
| Personnel comm. | | –1.069* | | –0.118 | | 0.102*** | | –0.105 | | –0.223 | | –0.247 |
| | | (0.580) | | (0.084) | | (0.039) | | (0.135) | | (0.190) | | (0.206) |
| Professnl. mgmt. | | –0.344 | | –0.102*** | | –0.041* | | –0.051 | | 0.054 | | –0.133* |
| | | (0.231) | | (0.033) | | (0.024) | | (0.052) | | (0.078) | | (0.081) |
| Constant | 6.474*** | 8.681*** | 5.740*** | 6.200*** | 3.918*** | 4.259*** | 7.202*** | 7.442*** | 6.525*** | 6.802*** | 6.098*** | 6.432*** |
| | (0.902) | (10.404) | (0.123) | (0.172) | (0.122) | (0.162) | (0.211) | (0.307) | (0.336) | (0.481) | (0.356) | (0.467) |
| Observations | 3,285 | 2,040 | 3,290 | 2,040 | 3,290 | 2,040 | 3,289 | 2,035 | 3,123 | 1,992 | 3,022 | 1,949 |
| Number of firms | 685 | 417 | 686 | 417 | 686 | 417 | 686 | 416 | 687 | 417 | 673 | 414 |
| Within R-squared | 0.014 | 0.026 | 0.010 | 0.032 | 0.006 | 0.011 | 0.019 | 0.020 | 0.011 | 0.010 | 0.030 | 0.039 |
| Overall R-squared | 0.021 | 0.048 | 0.019 | 0.028 | 0.054 | 0.059 | 0.053 | 0.082 | 0.113 | 0.115 | 0.018 | 0.024 |
| ρ (Fraction of error var. due to FE) | 0.354 | 0.289 | 0.562 | 0.482 | 0.795 | 0.806 | 0.668 | 0.566 | 0.420 | 0.329 | 0.476 | 0.477 |

Notes: Fixed effects at the firm level are used. Standard errors corrected for arbitrary heteroskedasticity and autocorrelation are in parentheses. Coefficients are significant at 1% (***); 5% (**); 10% (*) level, two-sided *t* test.

### 4.1 Firms' Promotion Standards

Regarding criteria for firms' promotions, focusing on the coefficients on the "real growth rate" and "primary sector" indicators in Tables 2 and 4, we find the following. Industry growth rate is related positively to the consideration of colleague ratings within primary-sector firms, but not in secondary-sector firms. The consideration of workers' achievement, performance of job duties, and certifications is not affected by the phase of business cycle. Primary-sector firms are less likely to take account of achievement analysis and colleague ratings, but somewhat more likely to consider performance of job duties. In growth years, primary-sector firms tend to use achievement analysis even more sparingly, while considering colleague ratings more.

### 4.2 Firms' Actual Promotion Practices

Regarding firms' observed promotion trends, Table 3 reveals the following trends. In growth years, firms expand the number of advancement steps among the regular-staff ranks, and increase the years to promotion of regular staff to junior management positions. One possible explanation is that expanded recruiting in high-growth years requires expanding of advancement categories into which workers are placed. Correspondingly, the typical years to promotion to regular or senior management positions fall in growth years. Primary-sector firms tend to have a higher number of advancement steps among the management relative to secondary-sector firms. This is not surprising given the scale and scope of operations (e.g., multi-plant structure) at primary-sector firms. Primary-sector firms also tend to have a longer wait until promotion, at all levels of the firm and particularly at the middle-management level. Finally, primary-sector firms have a higher fraction of promotions based on special merit.

Considering primary-sector and business-cycle phase interaction terms, Table 5 clarifies that the effect of business-cycle phases is driven by promotion practices at primary-sector firms. It is primary-sector firms that typically have a lower number of advancement steps among the regular staff, but increase them in growth years. Typical years to promotion among regular staff increase only imperceptibly in growth years among secondary-sector firms, but increase more noticeably at primary-sector firms (still statistically insignificant). Typical years to promotion among the senior management fall slightly during growth years at secondary-sector firms, but fall more so in primary-sector firms.

This finding qualifies the observation we have made in the preliminary review of data about typical years to promotion in growth years. It is among the primary-sector firms where the distribution of workers within organizations widens in growth years, with more workers remaining in regular staff rank and more managers promoted to senior management positions. As primary firms recruit more regular staff during growth years, the regular staffers' years to promotion to a limited number of junior managerial positions increases on average. At the same time, as the opportunities for business expansion improve during growth years, primary firms increase the number of managers and senior managers, so the promotions to those positions are streamlined. These tendencies are weaker at secondary-sector firms, due to weaker prospects of a significant business expansion in growth years.

Table 5 confirms that primary-sector firms have a higher number of advancement steps among the management relative to secondary-sector firms; longer wait until promotion, at all levels of the firm and particularly at the middle-management level; and a higher fraction of merit-based promotions.

In sum, these results from multivariate regressions confirm our observations from a preliminary review of data in Figures 2-5, quantify the trends, and carefully distinguish the effect of fluctuations across the business cycle and across primary and secondary sectors of the employment market. We can reiterate our claim that firms operating in either sector of the Korean labor market do not appear to be moving toward merit- and achievement-based promotions over time, and continue relying on job-content analysis and subjective ratings. The hierarchical structure of Korean firms has not changed over the past decade, with the number of years to promotion and advancement steps to the top remaining unchanged.

One limitation of these regressions is that they have a fairly low explanatory power over variation in the dependent variables. They achieve overall R-squared of 0.5%-11.5%, and within R-squared (corrected for economically-unexplained heterogeneity across firms) of 0.1%-10.7%. This suggests that either 1) the available explanatory variables in the HCCP are inadequate to explaining firms' promotion standards and practices, and more careful empirical analysis is needed; 2) firms' promotion standards and practices are driven by more complex non-economic factors or by randomness, which cannot be explained using economic data; or 3) firms' responses to the HCCP questionnaire are subject to large measurement errors. Follow-up work should focus on ascertaining or accounting for quality of firms' survey responses, say be weighting observations by the degree of professionalism of firms' HR departments, and accounting for a broader set of explanatory variables, including firm-specific informa-

tion on demand conditions for firms' products, markets served, marketplace uncertainty, firms' recruitment and layoffs etc.

## 5. Discussion

This study has evaluated the nature of promotion standards and practices, as well as their divergence across market sectors and time periods in a large sample of Korean firms. This panel dataset consisting of five biannual waves (2005-2013) is unique in its ability to shed light on firms' personnel promotion standards and practices, and their variation across firms as well as over time, during a decade of significant developments in the Korean economy.

We have found that promotion decisions at primary-sector firms are less likely to consider achievement analysis and colleague ratings, but rather performance of job duties than secondary-sector firms. Primary-sector firms have more advancement steps within the management rank relative to secondary-sector firms, and longer wait until promotion at all ranks. Secondary-sector firms are flatter hierarchically, featuring shorter times to promotion at all ranks and fewer advancement steps, but also a lower fraction of promotions based on special merit.

During expansionary years, the distribution of workers within organizations widens, particularly among primary-sector firms, with more workers remaining as regular staff but more managers promoted to senior management. As firms recruit more regular staff during expansions, years to promotion of regular staffers to managerial positions (and advancement steps in primary-sector firms) increase. Simultaneously, opportunities for business growth induce firms to streamline promotions to senior management (and to management at primary-sector firms). The consideration of workers' achievements falls in prevalence among primary-sector firms during expansions, while that of colleague ratings rises.

Over the past decade, hierarchical structure of firms has evolved unevenly, with the number of advancement steps increasing slightly at primary-sector firms, but time to promotion falling in both sectors. Promotions by special merit recede in both sectors. The importance of colleague ratings rises in both sectors, while that of workers' achievements rises at primary-sector and diminishes at secondary-sector firms.

Our main results were subjected to several robustness checks. First, given the possible delay or inertia in firms' response to market conditions, distributed lag models were estimated by supplementing explanatory variables with their one-year time lags. However, these additional variables were discarded for lack of individual significance and collinearity with variables of interest.

Second, additional control variables were considered. A binary indicator for workers' organizing under a hardline Korean Confederation of Trade Unions gives similar although weaker results. An interaction term of the unionization indicator with industry growth rate carries insignificant coefficients, suggesting that the effect of unions does not differ significantly across expansionary and recessionary years. Other considered control variables included an indicator for management or technical supervision by foreigners (at 10% of firms), and for operations abroad (at some 60% of firms).

One potentially valuable research extension would involve interacting other firm-level institutional variables with the business cycle indicator (and the primary-sector indicator) to understand whether the promotion policy of different types of organizations is differently changeable across business cycle phases (and economic sectors, respectively), and what it implies for their workers.

Our existing findings suggest that Korean firms are not moving toward merit- and achievement-based promotions over time, and continue relying on job-content analysis and subjective ratings, challenging the narrative advanced in the 2000s that in the aftermath of the 1997 crisis, Korean firms responded by adopting performance- and merit-based human resource management [10]. The hierarchical structure of Korean firms has not changed over the past decade [36], with the number of years to promotion and advancement steps to the top remaining constant. This could be viewed as a potential refutation or qualification of Cappelli's [37] observation: While significant changes have occurred in the Korean corporate culture since the 1990s through firms' adopting of western practices and responding to competitive pressures amid the 1997 financial crisis, the familial structure, the seniority-based promotions, and the attendant practices at Korean firms survive to this day. The lack of diversity and inclusion is a notable feature [38,39].

The trends identified in this study through observational (practices) as well as perception-based (standards) evidence translate into ineffective outcomes for firms and economic sectors during economy-wide upheavals, as well as chronically inequitable prospects and outcomes for workers themselves. Public policy should play a role in improving on the status quo, by advancing labor standards and advocacy for streamlining merit-based promotion determinations, and facilitating a transition to more responsive and inclusive organizational structures at firms, with the aim to strengthen the economy's dynamism, inclusivity, and resilience to crises such as the global supply-chain and workforce constraints arising amid COVID-19 and the unravelling Russia-Ukraine war [40].

## Conflict of Interest

The author has no conflict of interest in regard to this manuscript.

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## Appendix

**Table A1.** Results of conditional logistic regressions of criteria in firms' promotion decisions

| | Achievement analysis | | "Feedback" analysis | | Certifications | | Colleague ratings | | Achievement analysis | | "Feedback" analysis | | Certifications | | Colleague ratings | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Real growth rate | –0.03 | –0.04 | 0.11 | 0.07 | –0.03 | –0.02 | 0.12* | 0.12 | 0.13 | 0.16* | 0.12 | 0.14 | 0.01 | 0.05 | –0.52# | –0.47# |
| | (0.05) | (0.06) | (0.09) | (0.12) | (0.07) | (0.08) | (0.07) | (0.08) | (0.10) | (0.10) | (0.16) | (0.35) | (0.10) | (0.14) | (0.21) | (0.24) |
| Primary sector | 1.56 | 0.31 | 1.48 | –2.53 | 0.32 | –0.02 | 8.78§ | 9.39# | –1.54 | –2.98 | 8.61 | 3.55 | –3.41 | –7.15 | –8.21 | –11.55 |
| | (2.98) | (3.26) | (3.93) | (5.12) | (3.31) | (3.23) | (3.38) | (3.95) | (4.09) | (4.35) | (7.16) | (12.01) | (5.99) | (5.65) | (6.98) | (8.60) |
| Growth×Primary | | | | | | | | | –0.85# | –1.03§ | –0.12 | –0.41 | –0.19 | –0.38 | 2.58§ | 2.55§ |
| | | | | | | | | | (0.41) | (0.37) | (0.79) | (1.38) | (0.47) | (0.62) | (0.83) | (0.95) |
| Total workforce | 0.04 | 0.04 | 0.65 | 0.07 | –0.03 | 0.10 | 0.25 | 0.34 | –0.06 | –0.09 | 0.88 | 0.55 | –0.03 | –0.12 | 0.20 | 0.27 |
| | (0.13) | (0.13) | (1.10) | (1.52) | (0.10) | (0.27) | (0.24) | (0.33) | (0.16) | (0.18) | (1.55) | (1.90) | (0.21) | (0.31) | (0.24) | (0.29) |
| Unionization | 0.03 | –0.27 | 2.77# | 3.73 | –1.27 | 0.11 | –0.36 | –0.44 | 0.08 | –0.29 | 2.20 | 3.33 | –1.18 | 0.02 | 0.35 | 0.38 |
| | (0.70) | (0.81) | (1.40) | (2.37) | (1.05) | (1.15) | (1.20) | (1.24) | (0.79) | (0.89) | (1.41) | (2.43) | (1.02) | (1.13) | (1.25) | (1.32) |
| Year | –0.24 | –0.13 | –0.35 | 0.21 | 0.27 | 0.03 | 0.78# | 0.91# | –0.59§ | –0.57# | 0.13 | 0.71 | –0.07 | –0.54 | 0.19 | 0.03 |
| | (0.18) | (0.21) | (0.36) | (0.50) | (0.22) | (0.32) | (0.36) | (0.42) | (0.23) | (0.26) | (0.50) | (0.93) | (0.30) | (0.39) | (0.50) | (0.62) |
| $Year^2$ | 0.05 | 0.04 | 0.10 | –0.07 | –0.04 | 0.02 | –0.13 | –0.18* | 0.01 | –0.01 | 0.11 | –0.07 | –0.06 | 0.00 | –0.13 | –0.210* |
| | (0.05) | (0.05) | (0.09) | (0.11) | (0.07) | (0.10) | (0.09) | (0.10) | (0.05) | (0.06) | (0.09) | (0.12) | (0.08) | (0.10) | (0.09) | (0.12) |
| Year×Primary | | | | | | | | | 2.59# | 2.99§ | –3.02 | –2.70 | 2.05 | 3.13# | 2.65# | 4.35# |
| | | | | | | | | | (1.16) | (1.02) | (1.95) | (3.48) | (1.36) | (1.42) | (1.36) | (1.98) |
| HR-department | | 0.04 | | 1.38* | | 0.54 | | 0.20 | | 0.12 | | 1.14 | | 0.701* | | 0.23 |
| | | (0.31) | | (0.79) | | (0.40) | | (0.53) | | (0.32) | | (0.81) | | (0.41) | | (0.56) |
| HR-dept. size | | 0.01 | | 0.00 | | –0.01 | | 0.01 | | 0.02 | | 0.03 | | 0.02 | | 0.00 |
| | | (0.01) | | (0.08) | | (0.02) | | (0.02) | | (0.02) | | (0.08) | | (0.03) | | (0.02) |
| HRM teams | | –0.25 | | –0.04 | | –0.20 | | 0.01 | | 0.03 | | –0.27 | | 0.21 | | –0.05 |
| | | (0.24) | | (0.65) | | (0.38) | | (0.30) | | (0.24) | | (0.81) | | (0.42) | | (0.34) |
| Personnel comm. | | –0.48 | | –2.20§ | | 1.04 | | 0.32 | | –0.65 | | –1.79* | | 1.66* | | 0.24 |
| | | (0.50) | | (0.76) | | (0.71) | | (0.78) | | (0.61) | | (0.94) | | (0.94) | | (0.89) |
| Professnl. mgmt. | | 0.35# | | –0.92 | | –0.33* | | 0.25 | | 0.32# | | –0.94* | | –0.35* | | 0.31 |
| | | (0.17) | | (0.61) | | (0.20) | | (0.19) | | (0.16) | | (0.57) | | (0.21) | | (0.21) |
| Observations | 558 | 445 | 181 | 110 | 273 | 205 | 266 | 241 | 558 | 445 | 181 | 110 | 273 | 205 | 266 | 241 |
| Number of firms | 114 | 91 | 38 | 23 | 56 | 42 | 79 | 68 | 114 | 91 | 38 | 23 | 56 | 42 | 79 | 68 |
| Pseudo within $R^2$ | 0.007 | 0.034 | 0.085 | 0.190 | 0.022 | 0.059 | 0.163 | 0.208 | 0.058 | 0.095 | 0.113 | 0.207 | 0.050 | 0.116 | 0.228 | 0.280 |

Notes: Fixed effects at the firm level are used. Standard errors corrected for arbitrary heteroskedasticity and autocorrelation are in parentheses. Coefficients are significant at 1% (§); 5% (#); 10% (*) level, two-sided *t* test.