

Do CEOs Know Best? Chinese CEO, Manager and Worker Survey

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This Paper

New data: new management survey for around 1,000 firms across two large provinces in China

- Key innovation - management data from the CEO, senior managers and a random sample of workers
- Initial survey of 1,000 firms – bigger 2nd wave in 2018

Analysis: three initial focuses

- Which group's knowledge of firm's managerial capability is most predictive of firm performance?
- Does disagreement over management scores correlate with better/worse performance?
- Is management-performance relationship affected by disagreement over management scores?

Preview of Results

- 1) Large dispersion in the distribution of management score – similar to the US with slightly lower mean (so look reasonable)
- 2) Distribution of scores similar for CEOs, senior managers and workers (again looks reasonable)
- 3) But while scores across groups are correlated, far from completely
- 4) CEO's management scores are most predictive of firm performance, followed by senior managers and then workers
- 5) Weak negative link between disagreement & performance

Survey Description

Management Scores

Management and Performance: CEOs vs Workers

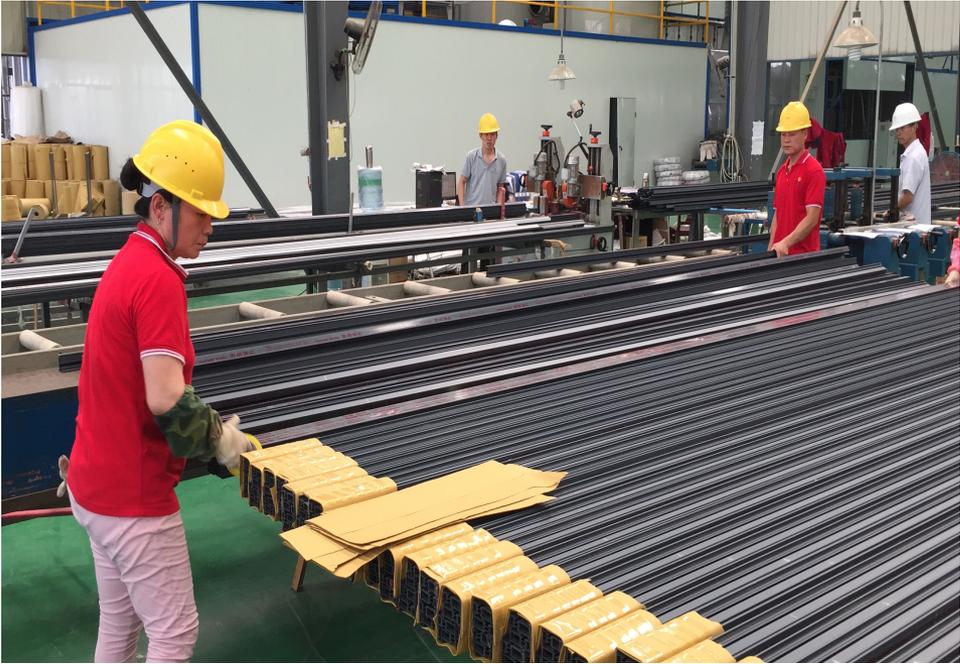
The China Employer-Employee Survey

- Longitudinal study of manufacturing firms and workers
- Initiated in 2014 by Hong Cheng (Wuhan University), Yang Du (Chinese Academy of Social Sciences), Hongbin Li (then Tsinghua University), and Albert Park (HKUST)
- Administered by the China Enterprise Survey and Data Center (CESDC) at Wuhan University
- Existing Chinese firm datasets have limited information or/and fail to acquire a representative sample of firms and workers

Medium sized Chinese manufacturing firm: aluminum



Medium sized Chinese manufacturing firm: aluminum



Text







The China Employer-Employee Survey

- Began in 2015 in Guangdong; Hubei added in 2016
- In 2018, plan to expand to 5 provinces
- Firms randomly sampled from 2014 National Economic Census
 - In each firm randomly sampled 10 workers (6-9 for smaller firms)
 - On average 8 respondents per firm: 1 CEO, 2 middle and senior managers and 5 workers

The China Employer-Employee Survey

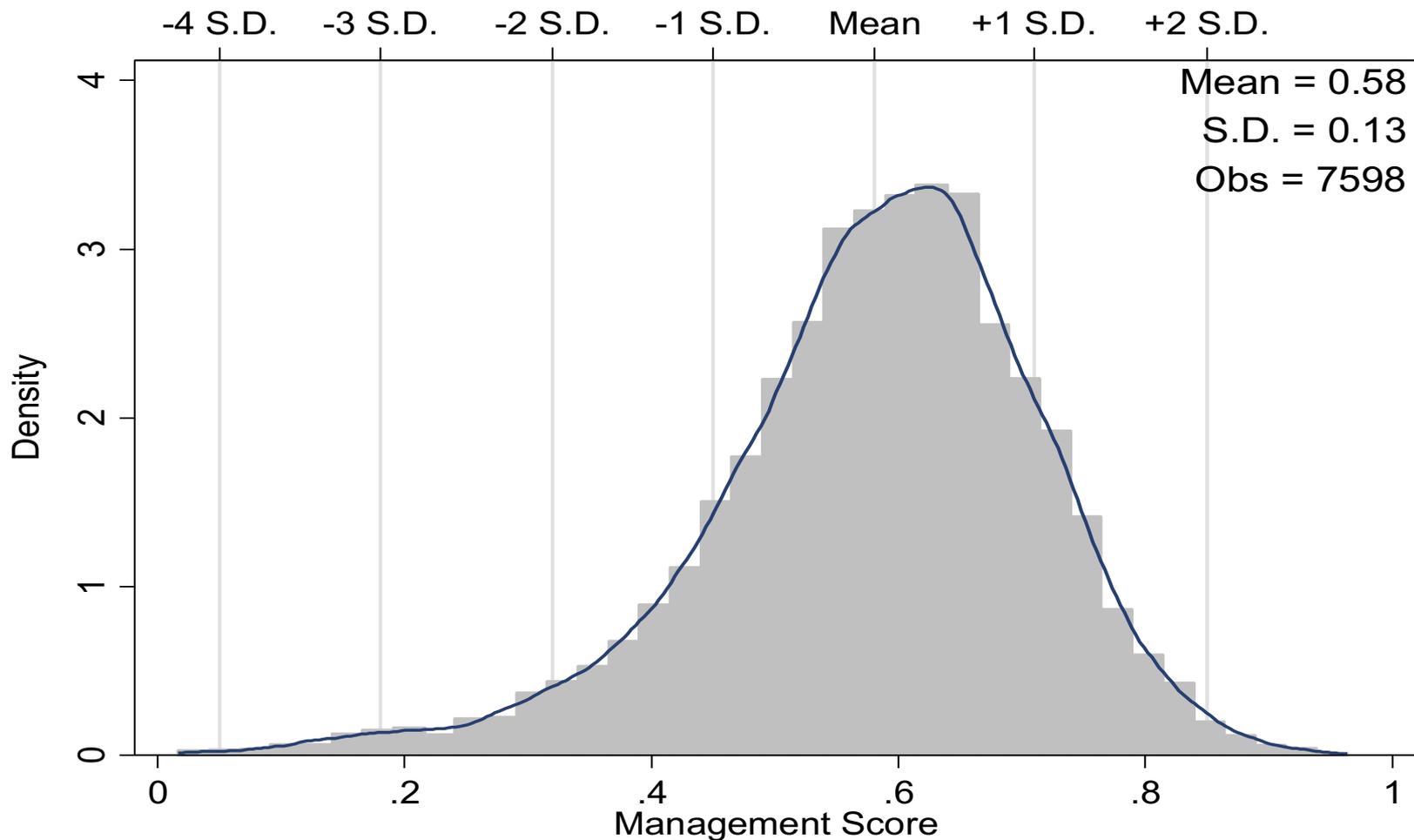
- About **1,000** firms and **10,000** workers from two provinces (Guangdong and Hubei) in 2016
- Response rate 84% for firms in 2016, about 90% for workers in baseline surveys
- 7 modules in firm questionnaire (1,030 variables); 5 modules in employee questionnaire (443 variables)
- Includes management module from MOPS

Survey Description

Management Scores

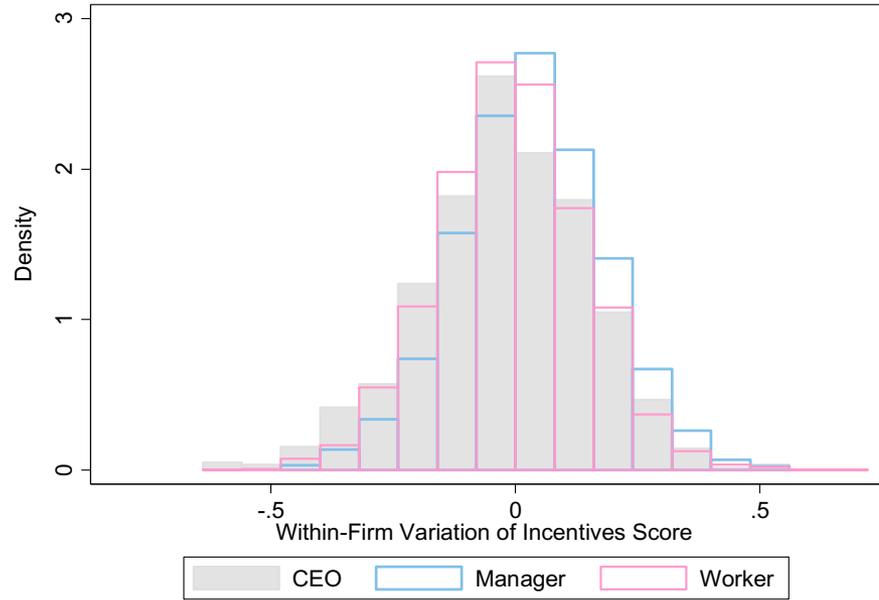
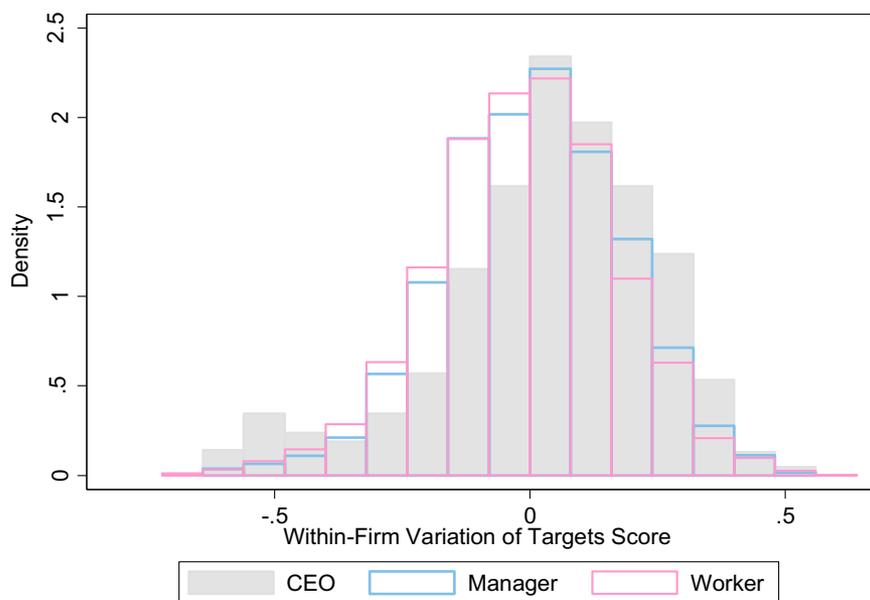
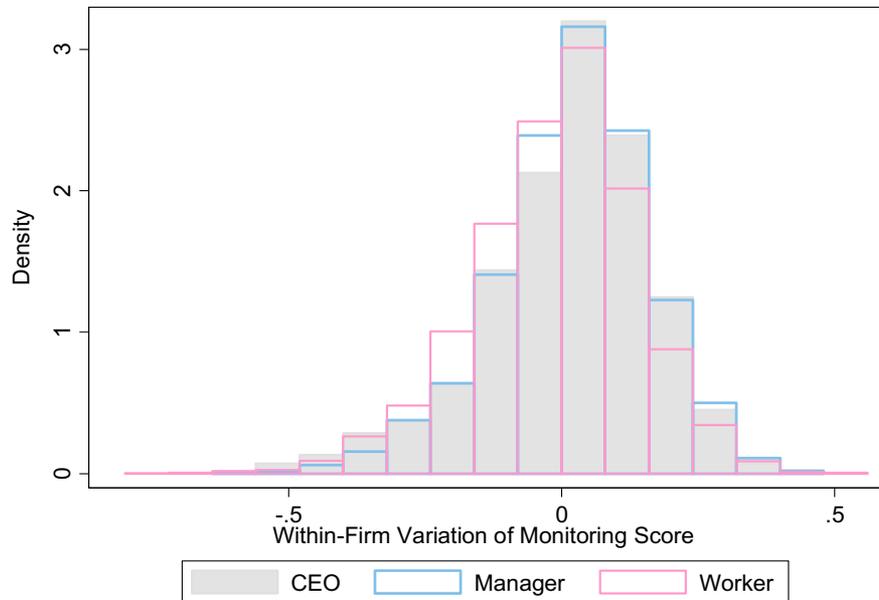
Management and Performance: CEOs vs Workers

**Similar spread as US (SD in China 0.13 vs 0.15 in US)
but lower mean (0.58 in China vs 0.64 in US)**



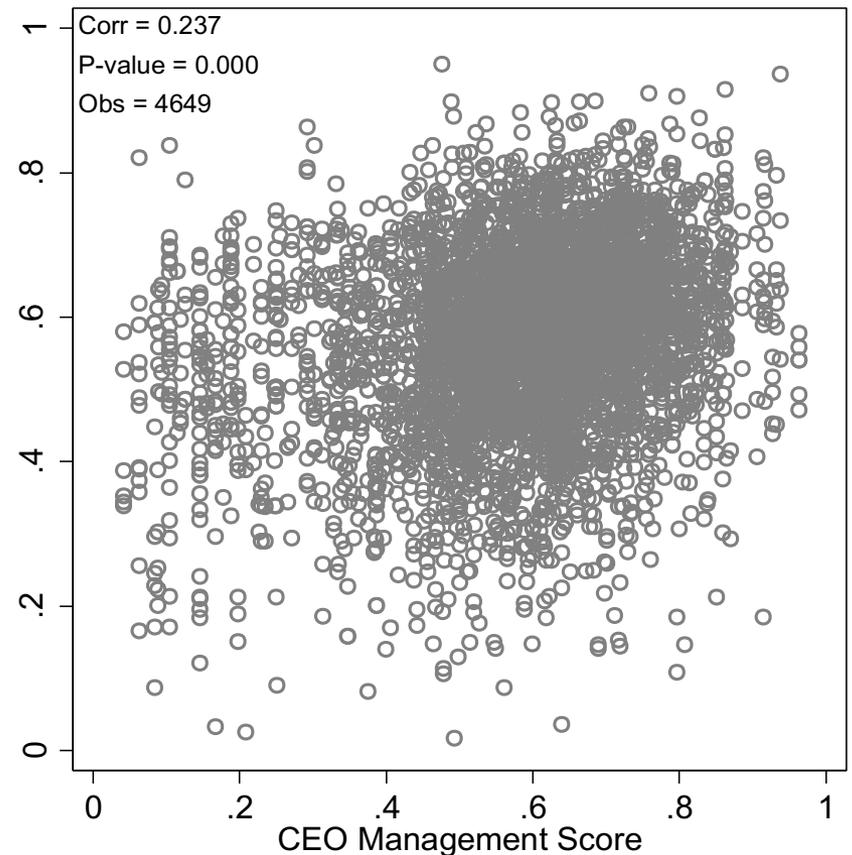
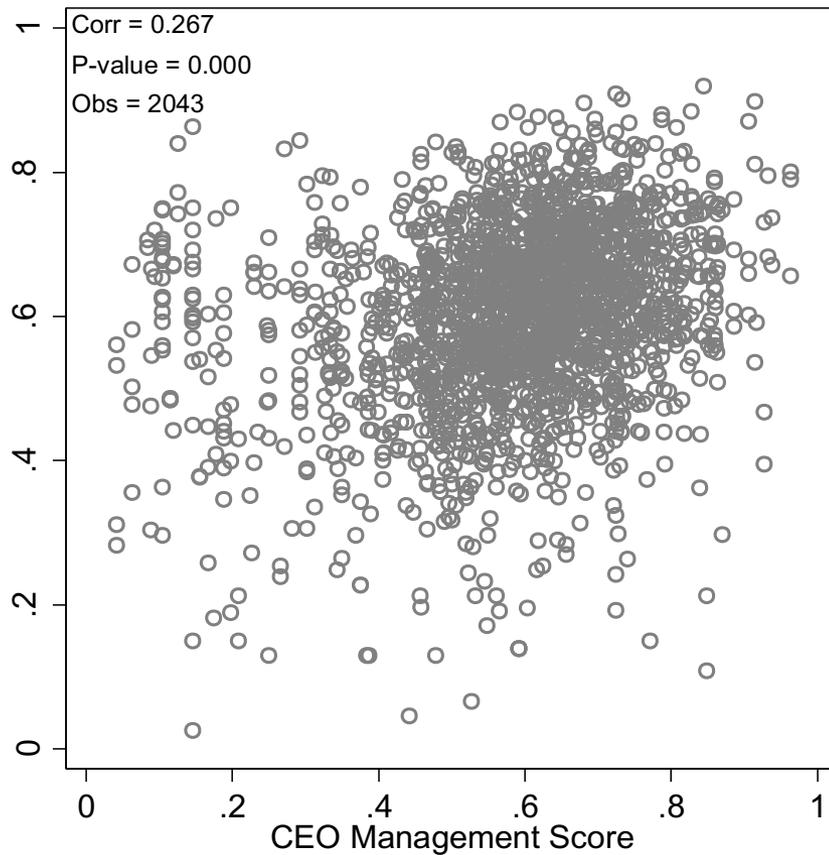
Notes: The management score is unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample is all 2015 CEES surveyors with at least 11 non-missing responses to management questions and from firms with positive value added, at least 20 employees, and positive capital.

CEOs, Managers & Workers similar practice spread



Notes: Monitoring score, targets score and incentive score are the unweighted average of the score for each of the questions in the monitoring section, targets section and incentive section respectively, where each question is first normalized to be on a 0-1 scale.

Correlated scores from CEOs, Managers and Workers



Notes: The management score is unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample is all 2015 CEES surveyors with at least 11 non-missing responses to management questions and from firms with positive value added, at least 20 employees, and positive capital. We further categorize surveyors into *CEOs*, *managers* and *workers*. Managers include all middle and senior managers. Workers include administrative and office staff, technician or design personnel, sales personnel, front-line workers, and other staff.

Survey Description

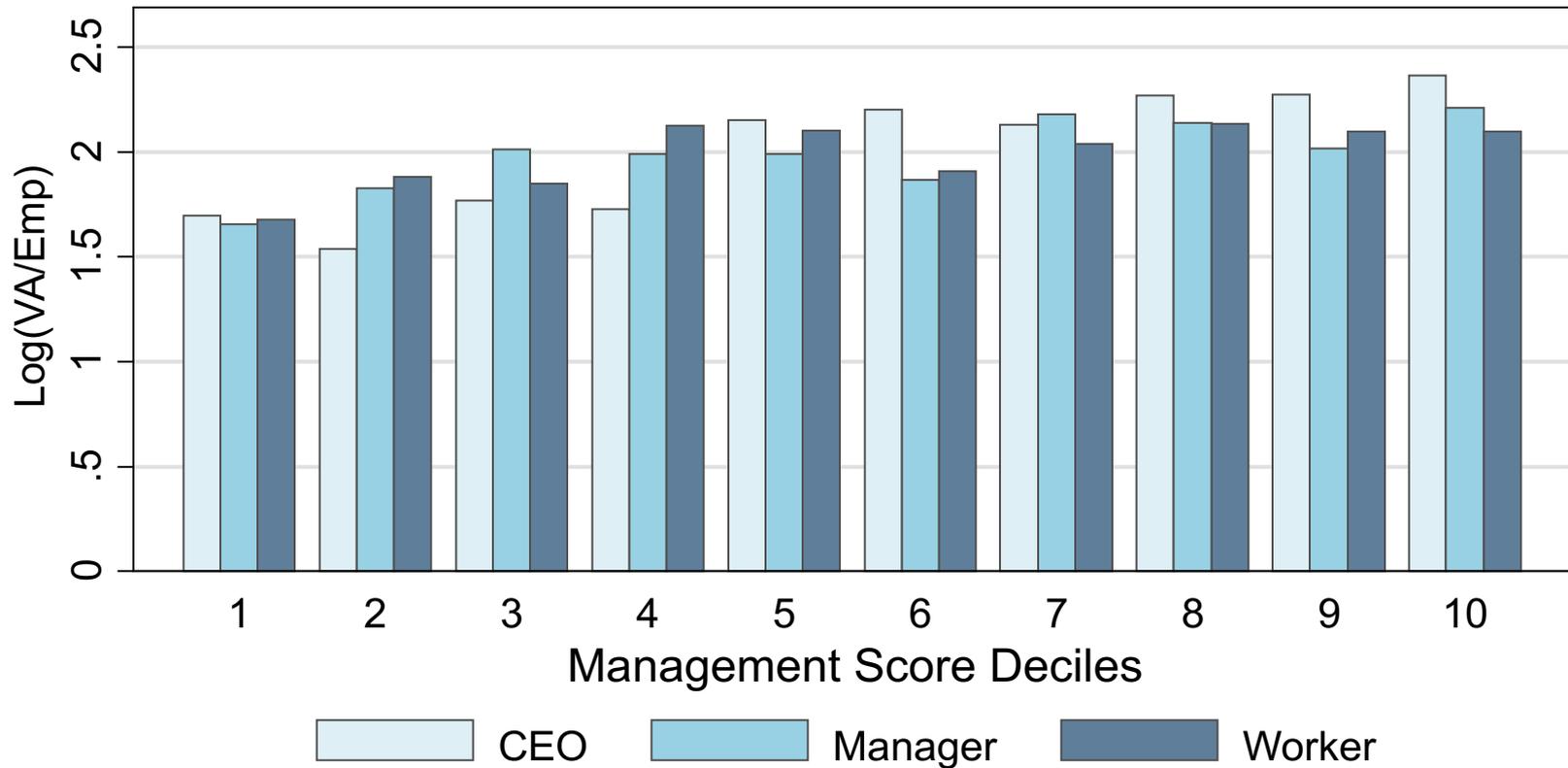
Management Scores

Management and Performance: CEOs vs Workers

Unique feature of Survey is the CEO, Manager and random Worker responses

But whose scores best predict firm performance – do
CEOs know best?

Yes – CEOs do seem to know best: Log(VA/EMP)



CEO: Corr = 0.145, P-value = 0.000, Obs = 843

Manager: Corr = 0.094, P-value = 0.000, Obs = 1816

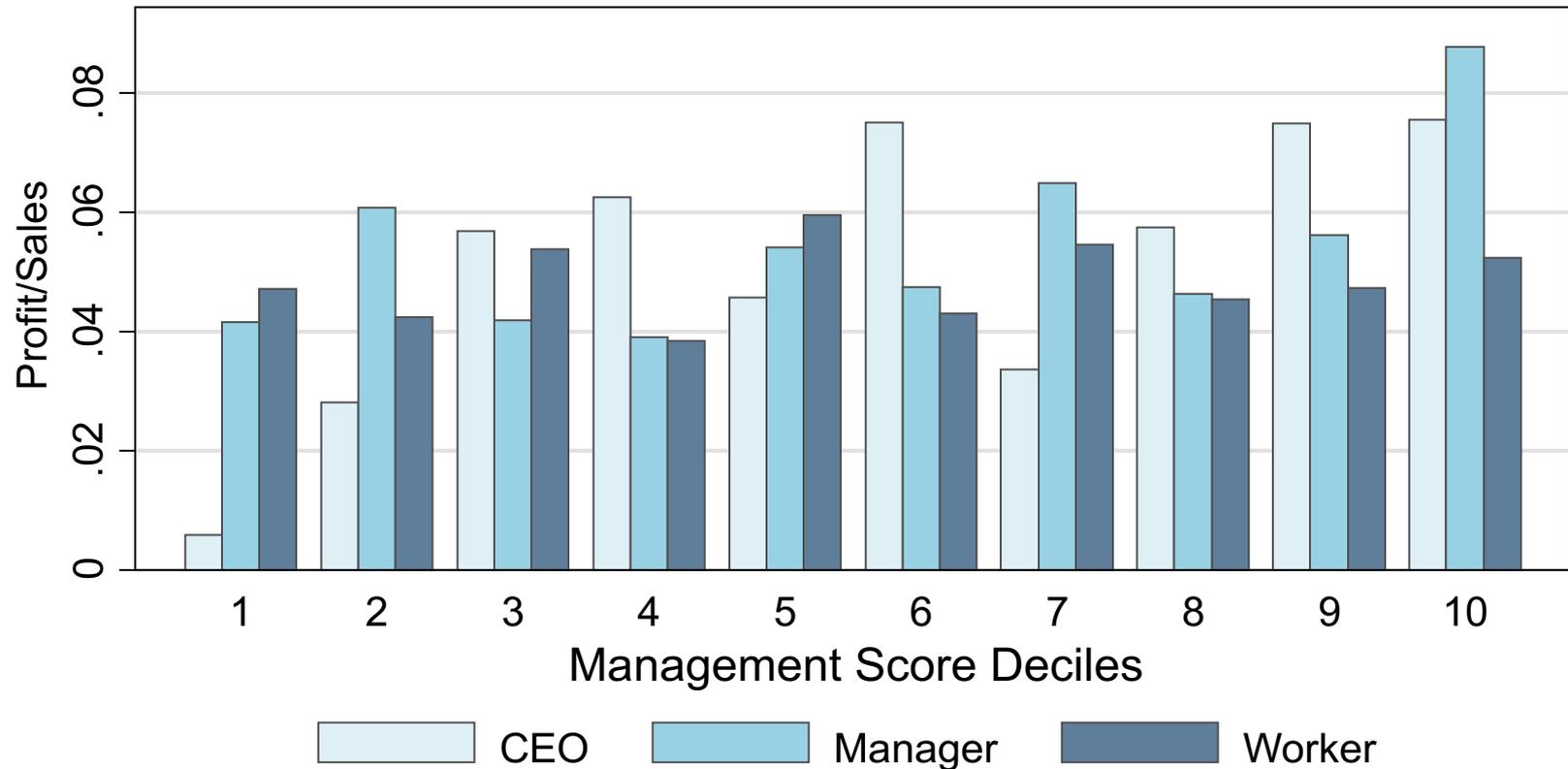
Worker: Corr = 0.077, P-value = 0.000, Obs = 4118

Avg (Equal wgt each surveyor): Corr= 0.160, P-value= 0.000, Obs= 6777

Avg (Equal wgt each group): Corr= 0.154, P-value= 0.000, Obs= 843

Notes: The management score is unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample is all 2015 CEES surveyors with at least 11 non-missing responses to management questions and from firms with positive value added, at least 20 employees, and positive capital. The management deciles are calculated using the scores for CEOs, managers and workers separately. We report the correlation between firms' value added per employee and above and individual management scores of CEO, manager and worker respectively, as well as the average management scores at firm level, where we either weigh the employees within a firm equally or weigh the average management scores from CEO, managers and workers within a firm equally.

Yes – CEOs do seem to know best: Profit/Sales



CEO: Corr = 0.106, P-value = 0.001, Obs = 923

Manager: Corr = 0.042, P-value = 0.062, Obs = 1993

Worker: Corr = 0.008, P-value = 0.569, Obs = 4511

Avg (Equal wgt each surveyor): Corr= 0.061, P-value= 0.000, Obs= 7427

Avg (Equal wgt each group): Corr= 0.083, P-value= 0.012, Obs= 923

Notes: The management score is unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample is all 2015 CEES surveyors with at least 11 non-missing responses to management questions and from firms with positive value added, at least 20 employees, and positive capital. The management deciles are calculated using the scores for CEOs, managers and workers separately. We report the correlation between firms' profits per sale and above and individual management scores of CEO, manager and worker respectively, as well as the average management scores at firm level, where we either weigh the employees within a firm equally or weigh the average management scores from CEO, managers and workers within a firm equally.

Yes – CEOs do seem to know best!

Table 1. Management Scores and Performance: Benchmark, Bootstrap

	Log(VA/Emp)			Emp. Growth			Profit/Sales		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CEO Score	1.266*** (0.359)			0.050** (0.023)			0.074** (0.034)		
Manager Score		1.190*** (0.267)			0.052*** (0.017)			0.030 (0.025)	
Worker Score			1.128*** (0.350)			0.037 (0.023)			0.024 (0.031)
No. of Obs	748	748	748	800	800	800	820	820	820
Fixed Effects	Province	Province	Province	Province	Province	Province	Province	Province	Province

Notes: Significance levels: * 10%, ** 5%, *** 1%. We categorize workers into manager (middle and senior manager) and non-manager (other administrative staff (other office staff included), and technician or design personnel, sales personnel, front-line worker, and other staff). Reported coefficients and standard errors in each column are computed as the mean and standard deviation of the regression coefficients across 200 bootstrap replicates. In each bootstrap replicate, we randomly draw one manager and one worker from each firm. For each of the dependent variables, we run three regressions by including the management score from each firm's CEO, manager and worker drawn separately.

Yes – CEOs do seem to know best!

Table 2. Management Score and Performance: Bootstrap

	Log(VA/Emp)	Emp. Growth	Profit/Sales	Log(Capital/Emp)	Log(RND/Emp)
	(1)	(2)	(3)	(4)	(5)
Management					
CEO	0.728*** (0.124)	0.037*** (0.007)	0.067*** (0.011)	1.529*** (0.107)	0.682*** (0.049)
Manager	0.759** (0.325)	0.024 (0.019)	0.016 (0.029)	0.256 (0.107)	0.364*** (0.128)
Worker	0.690 (0.419)	0.003 (0.027)	-0.012 (0.037)	0.332 (0.348)	0.298* (0.155)
No. of Obs.	748	800	820	840	773
Controls	No	No	No	No	No
Fixed Effects	Province	Province	Province	Province	Province

Notes: Significance levels: * 10%, ** 5%, *** 1%. We categorize workers into manager (middle and senior manager) and worker (other administrative staff (other office staff included), and technician or design personnel, sales personnel, front-line worker, and other staff). Reported coefficients and standard errors in each column are computed as the mean and standard deviation of the regression coefficients across 200 bootstrap replicates. In each bootstrap replicate, we randomly draw one manager and one worker from each firm, and run a regression that includes the management scores from each firm's CEO, manager and worker drawn. Survey quality controls include: imputed survey duration, time of the day when survey started, survey day of the week, survey week of the year, respondent tenure and seniority.

Also study dispersion of scores – appears to be bad for investment and R&D (not clear why though?)

Table 3. Dispersion and Performance: Dispersion Measure 1

	Log(VA/Emp)	Emp. Growth	Profit/Sales	Log(Capital/Emp)	Log(RND/Emp)
	(1)	(2)	(3)	(4)	(5)
Log(Capital/Emp)	0.578*** (0.013)	-0.007*** (0.001)	0.003** (0.001)		0.213*** (0.005)
Log(Emp)	0.030** (0.012)	0.007*** (0.001)	0.002 (0.001)	0.042*** (0.011)	0.080*** (0.005)
D1	-0.313 (0.209)	0.010 (0.015)	0.027 (0.022)	-0.527*** (0.194)	-0.153* (0.088)
Observations	6,740	6,880	7,384	7,390	6,939
Fixed Effects	Province	Province	Province	Province	Province
Adjusted R²	0.256	0.256	0.256	0.256	0.256

Notes: Significance levels: * 10%, ** 5%, *** 1%. We include CEOs and managers and workers in regressions. Standard errors are clustered at province level. $D = |m_{ij} - \bar{m}_{-ij}|$, m_{ij} denotes the management score of employee i in firm j . \bar{m}_{-ij} denotes the average management score of all other employees excluding employee i in firm j . Survey quality controls include: imputed survey duration, time of the day when survey started, survey day of the week, survey week of the year.

Also study dispersion of scores – appears to be bad for investment and R&D (not clear why though?)

Table 4. Dispersion and Performance: Dispersion Measure 2

	Log(VA/Emp)	Emp. Growth	Profit/Sales	Log(Capital/Emp)	Log(RND/Emp)
	(1)	(2)	(3)	(4)	(5)
Log(Capital/Emp)	0.578*** (0.013)	-0.007*** (0.001)	0.003** (0.001)		0.213*** (0.005)
Log(Emp)	0.031** (0.012)	0.007*** (0.001)	0.002 (0.001)	0.040*** (0.011)	0.079*** (0.005)
D2	-0.229 (0.225)	0.030* (0.016)	0.030 (0.024)	-0.813*** (0.212)	-0.329*** (0.095)
Observations	6,740	6,880	7,384	7,390	6,939
Fixed Effects	Province	Province	Province	Province	Province
Adjusted R₂	0.257	0.257	0.257	0.257	0.257

Notes: Significance levels: * 10%, ** 5%, *** 1%. We include CEOs and managers and workers in regressions. Standard errors are clustered at province level.

$$D_3 = \frac{1}{16} \sum_{k=1}^{16} |m_{ijk} - \bar{m}_{-ijk}|$$

m_{ijk} denotes management score for question k from employee i in firm j. \bar{m}_{-ijk} denotes the average

management score for question k from all other employees excluding employee i in firm j. Survey quality controls include: imputed survey duration, time of the day when survey started, survey day of the week, survey week of the year.

Table 5. Dispersion and Performance: Dispersion Measure 1

	Log(VA/Emp)	Emp. Growth	Profit/Sales	Log(Capital/Emp)	Log(RND/Emp)
	(1)	(2)	(3)	(4)	(5)
Log(Capital/Emp)	0.574*** (0.013)	-0.007*** (0.001)	0.003** (0.001)		0.209*** (0.005)
Log(Emp)	0.025** (0.012)	0.006*** (0.001)	0.001 (0.001)	0.016 (0.011)	0.073*** (0.005)
D1	0.448 (0.636)	0.121*** (0.045)	0.085 (0.068)	3.685*** (0.590)	0.794*** (0.269)
Management	0.474* (0.247)	0.071*** (0.017)	0.054** (0.026)	2.401*** (0.227)	0.600*** (0.104)
D1 * Management	-1.309 (1.140)	-0.187** (0.080)	-0.089 (0.122)	-7.341*** (1.055)	-1.609*** (0.481)
Observations	6,740	6,880	7,384	7,390	6,939
Fixed Effects	Province	Province	Province	Province	Province
Adjusted R²	0.261	0.261	0.261	0.261	0.261

Notes: Significance levels: * 10%, ** 5%, *** 1%. We include CEOs and managers and workers in regressions. Standard errors are clustered at province level. $D_2 = |m_{ij} - \bar{m}_{-ij}|$, m_{ij} denotes the management score of employee i in firm j. \bar{m}_{-ij} denotes the average management score of all other employees excluding employee i in firm j. Survey quality controls include: imputed survey duration, time of the day when survey started, survey day of the week, survey week of the year.

Table 6. Dispersion and Performance: Dispersion Measure 2

	Log(VA/Emp)	Emp. Growth	Profit/Sales	Log(Capital/Emp)	Log(RND/Emp)
	(1)	(2)	(3)	(4)	(5)
Log(Capital/Emp)	0.574*** (0.013)	-0.007*** (0.001)	0.003** (0.001)		0.209*** (0.005)
Log(Emp)	0.025** (0.012)	0.006*** (0.001)	0.001 (0.001)	0.021* (0.011)	0.074*** (0.005)
D2	1.877** (0.797)	0.212*** (0.056)	0.150* (0.085)	2.712*** (0.743)	0.765** (0.337)
Management	1.319*** (0.428)	0.128*** (0.030)	0.095** (0.046)	2.683*** (0.395)	0.809*** (0.180)
D2 * Management	-3.735*** (1.417)	-0.310*** (0.100)	-0.193 (0.151)	-5.778*** (1.316)	-1.825*** (0.598)
Observations	6,740	6,880	7,384	7,390	6,939
Fixed Effects	Province	Province	Province	Province	Province
Adjusted R ²	0.261	0.261	0.261	0.261	0.261

Notes: Significance levels: * 10%, ** 5%, *** 1%. We include CEOs and managers and workers in regressions. Standard errors are clustered at province level. $D_3 = \frac{1}{16} \sum_{k=1}^{16} |m_{ijk} - \bar{m}_{-ijk}|$, m_{ijk} denotes management score for question k from employee i in firm j. \bar{m}_{-ijk} denotes the average

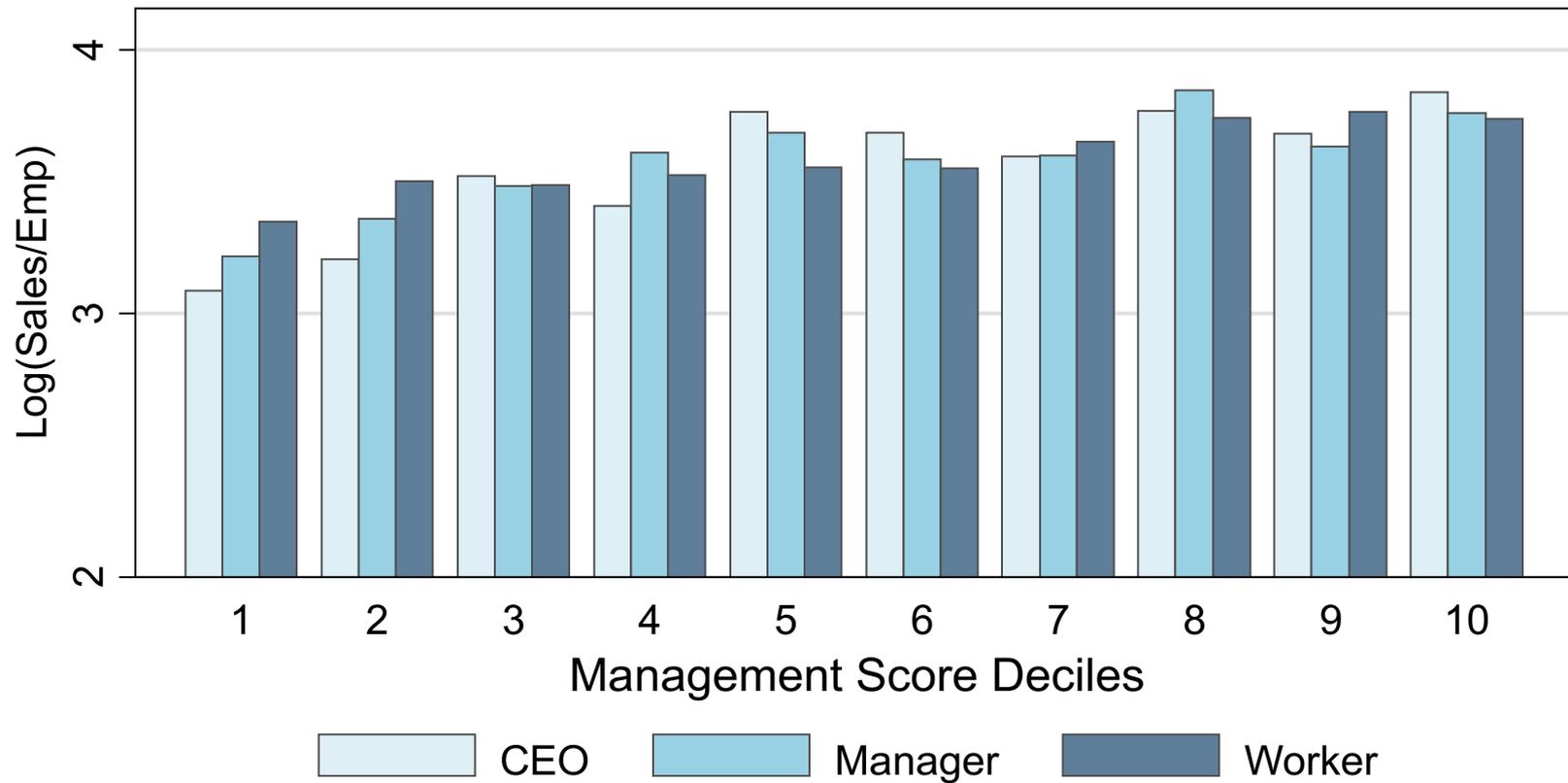
management score for question k from all other employees excluding employee i in firm j. Survey quality controls include: imputed survey duration, time of the day when survey started, survey day of the week, survey week of the year.

From first 1,000 firm wave 5 results

- 1) Large dispersion in the distribution of management score – similar to the US with slightly lower mean (so look reasonable)
- 2) Distribution of scores similar for CEOs, senior managers and workers (again looks reasonable)
- 3) But while scores across groups are correlated, far from completely
- 4) CEO's management scores are most predictive of firm performance, followed by senior managers and then workers
- 5) Weak negative link between disagreement & performance

Back Up

Figure A1: Firm Sales/Employee vs. Management Score in 2015



CEO: Corr = 0.179, P-value = 0.000, Obs = 927

Manager: Corr = 0.131, P-value = 0.000, Obs = 2001

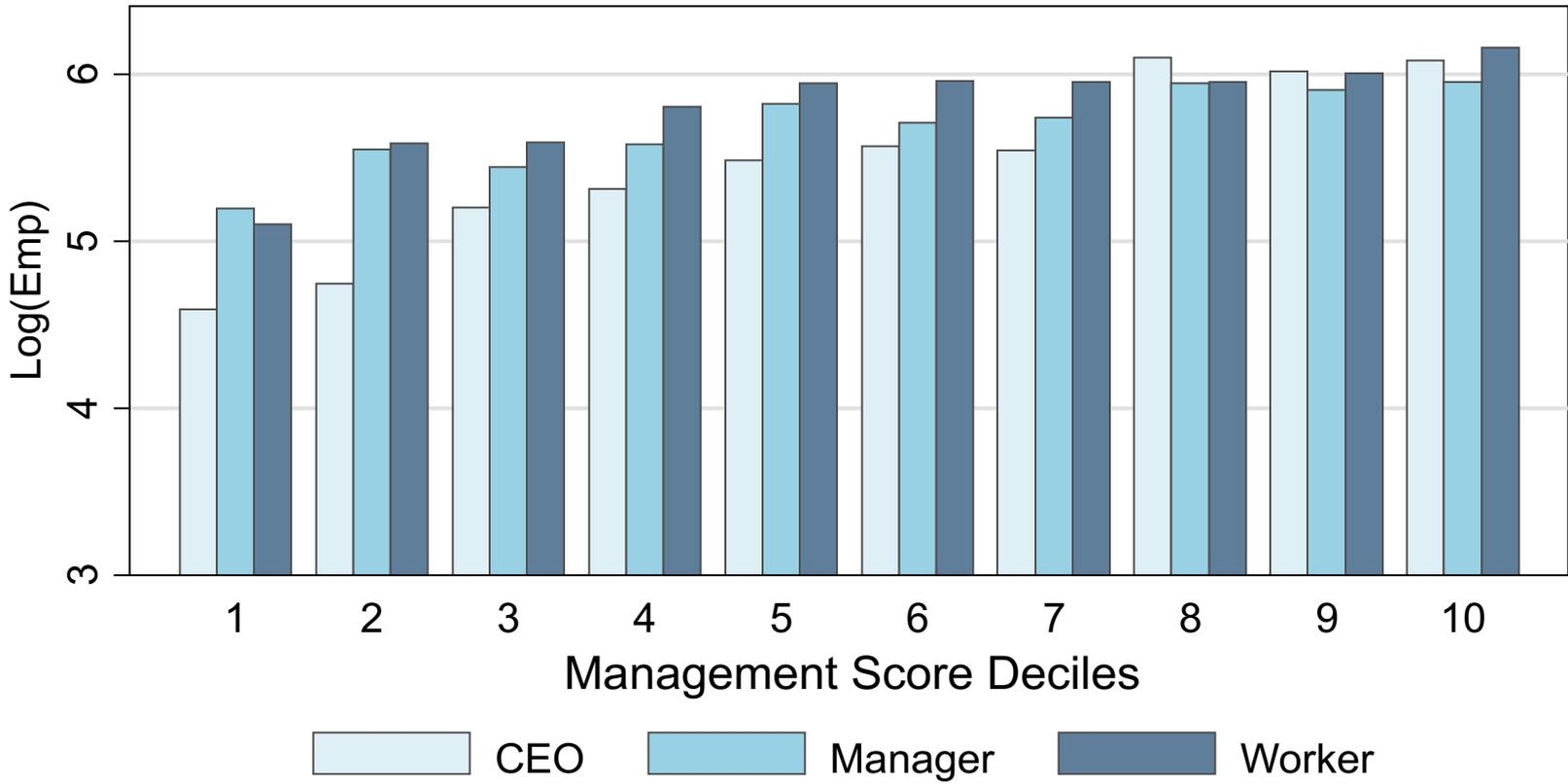
Worker: Corr = 0.104, P-value = 0.000, Obs = 4539

Avg (Equal wgt each surveyor): Corr= 0.213, P-value= 0.000, Obs= 7467

Avg (Equal wgt each group): Corr= 0.169, P-value= 0.000, Obs= 927

Notes: The management score is unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample is all 2015 CEES surveyors with at least 11 non-missing responses to management questions and from firms with positive value added, at least 20 employees, and positive capital. The management deciles are calculated using the scores for CEOs, managers and workers separately. We report the correlation between firms' sales per employee and above and individual management scores of CEO, manager and worker respectively, as well as the average management scores at firm level, where we either weigh the employees within a firm equally or weigh the average management scores from CEO, managers and workers within a firm equally.

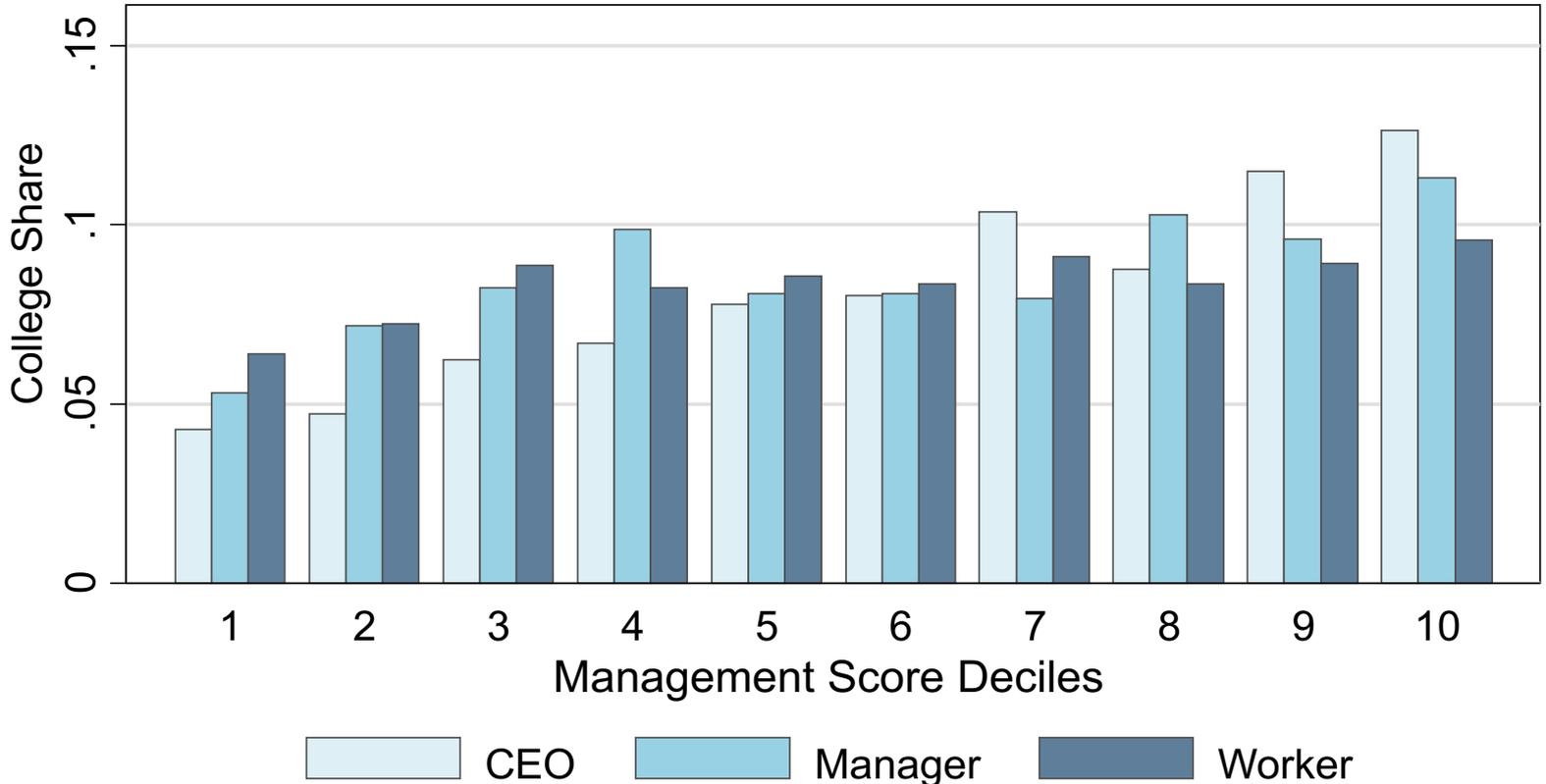
Figure A2: Firm Size vs. Management Score in 2015



CEO: Corr = 0.307, P-value = 0.000, Obs = 943
 Manager: Corr = 0.152, P-value = 0.000, Obs = 2029
 Worker: Corr = 0.186, P-value = 0.000, Obs = 4621
 Avg (Equal wgt each surveyor): Corr= 0.335, P-value= 0.000, Obs= 7593
 Avg (Equal wgt each group): Corr= 0.358, P-value= 0.000, Obs= 943

Notes: The management score is unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample is all 2015 CEES surveyors with at least 11 non-missing responses to management questions and from firms with positive value added, at least 20 employees, and positive capital. The management deciles are calculated using the scores for CEOs, managers and workers separately. We report the correlation between firms' log of employment and individual management scores of CEO, manager and worker respectively, as well as the average management scores at firm level, where we either weigh the employees within a firm equally or weigh the average management scores from CEO, managers and workers within a firm equally.

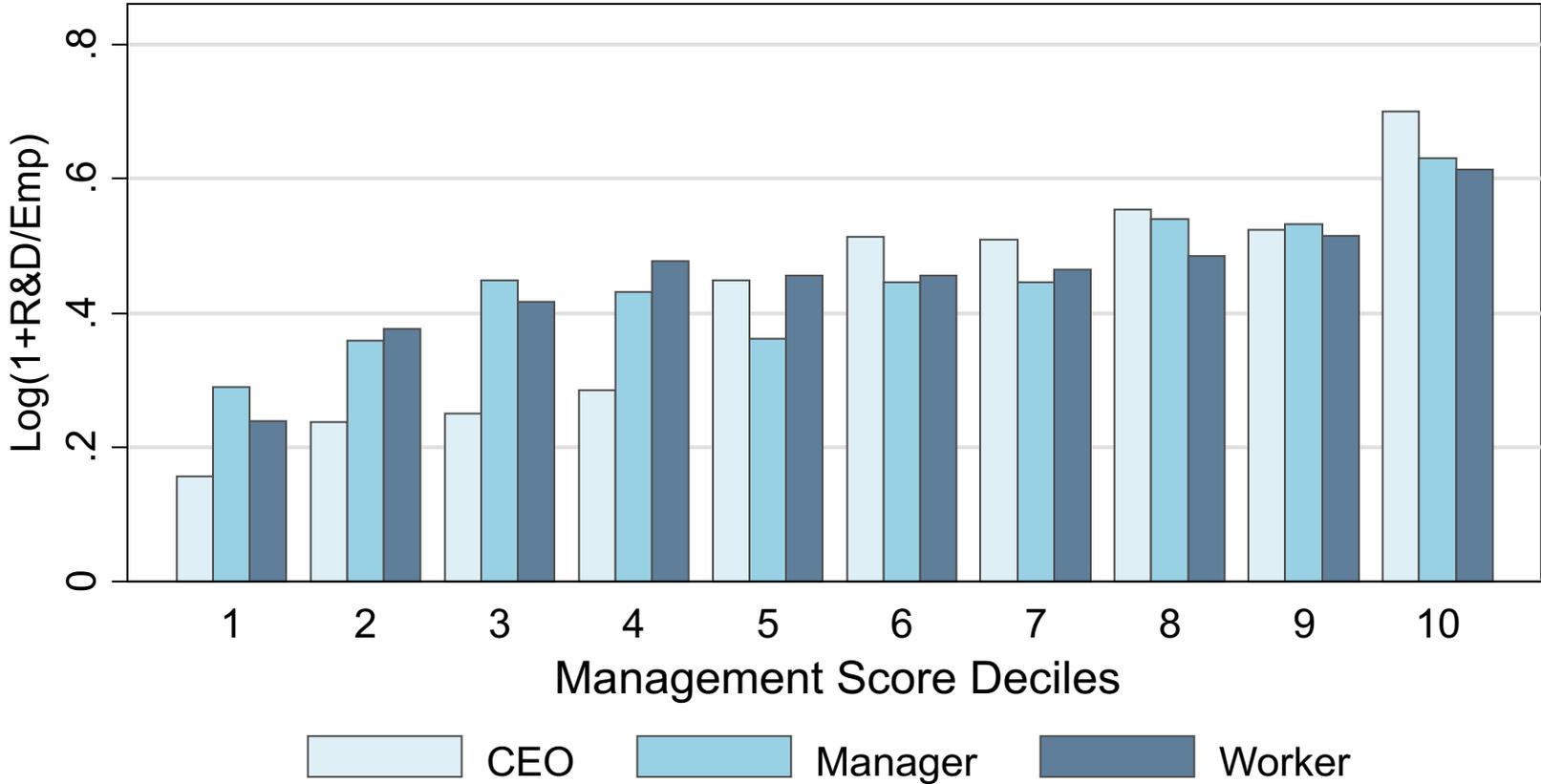
Figure A3: Share College vs. Management Score in 2015



CEO: Corr = 0.208, P-value = 0.000, Obs = 870
 Manager: Corr = 0.120, P-value = 0.000, Obs = 1884
 Worker: Corr = 0.067, P-value = 0.000, Obs = 4271
 Avg(Equal wgt each surveyor): Corr= 0.184, P-value= 0.000, Obs= 7025
 Avg(Equal wgt each group): Corr= 0.204, P-value= 0.000, Obs= 870

Notes: The management score is unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample is all 2015 CEES surveyors with at least 11 non-missing responses to management questions and from firms with positive value added, at least 20 employees, and positive capital. The management deciles are calculated using the scores for CEOs, managers and workers separately. We report the correlation between firms' share of employees with college degree and above and individual management scores of CEO, manager and worker respectively, as well as the average management scores at firm level, where we either weigh the employees within a firm equally or weigh the average management scores from CEO, managers and workers within a firm equally.

Figure A4: R&D per Employee vs. Management Score in 2015



CEO: Corr = 0.240, P-value = 0.000, Obs = 870
 Manager: Corr = 0.133, P-value = 0.000, Obs = 1877
 Worker: Corr = 0.133, P-value = 0.000, Obs = 4232
 Avg (Equal wgt each surveyor): Corr= 0.258, P-value= 0.000, Obs= 6979
 Avg (Equal wgt each group): Corr= 0.262, P-value= 0.000, Obs= 870

Notes: The management score is unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample is all 2015 CEES surveyors with at least 11 non-missing responses to management questions and from firms with positive value added, at least 20 employees, and positive capital. The management deciles are calculated using the scores for CEOs, managers and workers separately. We report the correlation between firms' log of 1+R&D expenditure per employee and above and individual management scores of CEO, manager and worker respectively, as well as the average management scores at firm level, where we either weigh the employees within a firm equally or weigh the average management scores from CEO, managers and workers within a firm equally.

Table A1: Sample Size and Response Rates of CEES Survey in Hubei and Guangdong Provinces of China

	Number of observations	Response rate
Firm survey 2015 (Guangdong only)	573	82%
Firm survey 2016	1,122	84%
New sample (Hubei)	585	83%
Follow up sample (Guangdong)	537	90%
New sample (Guangdong)	50	--
Worker survey 2015 (Guangdong only)	4,838	88%
Worker survey 2016	9,103	80%
New sample (Hubei)	4,114	89%
Follow up sample (Guangdong)	2,575	89%
New sample (Guangdong)	2,414	89%

Table A2: Characteristics of CEES vs. the Census and Yearbook (Hubei and Guangdong provinces of China)

	The 3rd National Economic Census	2016 Statistical Yearbook	2016 CEES
No. of firms (thousand)	361.13	56.45	1.12
Employment (person)	69	307	62
Assets (million RMB)	30.5	197.7	52.1
Industrial output (million RMB)		281.1	50.3
Profit (million RMB)		15.9	3
Profit rate (profit/sales %)		5.5	6.5
Type of Registration			
Domestic-funded firms	91	76	94
Hong Kong, Macao or Taiwan funded firms	6	16	4
Foreign-funded firms	2	8	2
Type of Ownership (official definition)			
State owned		3	2
Non-state owned		97	98
Type of Industry			
Food	6	8	21
Textile & Leather	13	14	10
Wood Processing	15	11	7
Chemical	5	7	3
Nonmetal	14	16	28
Metal	12	10	9
Machine & Equipment	14	13	12
Electronical Device	19	19	9
Others	2	1	1

Notes: Calculations from CEES data are weighted using both the firm size weight in a county (the probability of a firm being in a sample is proportional to its employment size) and the employment weight within a firm in 2013. Statistical Yearbook tabulations are based on *the Survey of Enterprises above Designated Size* with annual primary operating revenue exceeding 20 million RMB. The Third National Economic Census (carried out in 2013) tabulations are from *The Statistical Bulletin for the Third National Economic Census*. Industries are classified according to the two-digit code of the *Industrial Classification for National Economic Activities* (GB/4754-2011), and we combine them into larger groups.

Table A3. Descriptive Statistics of Firm Sample

A. Management Descriptives	Mean	S.D.	p(10)	p(25)	p(50)	p(75)	p(90)
Management Score	0.57	0.16	0.35	0.5	0.6	0.68	0.76
B. Firm Characteristics							
Firm size	928.35	2925.57	35	70	203	637	2073
Firm age	11.69	7.68	3	6	11	15	21
% of managers	0.08	0.06	0.02	0.03	0.07	0.1	0.16
% of union members	0.1	0.21	0	0	0.02	0.08	0.23
Exporter	0.47	0.5	0	0	0	1	1
High tech	0.3	0.46	0	0	0	1	1
SOE	0.14	0.34	0	0	0	0	1
C. Sample Descriptives							
No. firms	950						

Notes: The management score is the unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample in all columns is all CEES firms in 2015 with at least 11 non-missing responses to management questions. For the few cases where establishment characteristics had missing values, we replaced these with the means in the sample, so to keep a constant sample size. P(n) is the value at the n-th percentile, e.g. p(50) is the median value.

Table A4. Descriptive Statistics of Employee Sample

A. Management Descriptives	Mean	S.D.	p(10)	p(25)	p(50)	p(75)	p(90)
Management Score	0.58	0.13	0	1	1	1	1
B. Firm Characteristics							
Male	0.56	0.5	0	0	1	1	1
Party membership	0.14	0.35	0	0	0	0	1
Age	35.86	9.36	25	28	35	43	49
Education	4.55	1.51	3	3	4	6	7
Position	3.14	1.82	1	1	3	5	5
C. Sample Descriptives							
No. employees per firm	7.39						
No. employees	6692						
No. firms	906						

Notes: The management score is the unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample in all columns is all CEES employees in 2015 with at least 11 non-missing responses to management questions and age 18-65. The education levels are defined as 0 “no school”, 1 “primary school”, 2 “secondary school”, 3 “high school”, 4 “technical/vocational”, 5 “junior college/diploma”, 6 “undergrad/bachelor”, 7 “master”, 8 “graduate/phd”. The employee positions are defined as 1 “Middle and senior manager”, 2 “Other administrative staff (other office staff included)”, 3 “Technician or design personnel”, 4 “Sales personnel”, 5 “Front-line worker”, 6 “Other staff”. For the few cases where employee characteristics had missing values, we replaced these with the means in the sample, so to keep a constant sample size. P(n) is the value at the n-th percentile, e.g. p(50) is the median value.

Table A5. Descriptive Statistics of CEO and Employees

	Average No. in Each Firm	Average Management Score	Typical Job Title
CEO	1.00	0.57	CEO
Manager	2.25	0.60	Middle and senior manager
Worker	5.13	0.57	Front-line worker

Notes: The management score is the unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0-1 scale. The sample in all columns is all CEES employees in 2015 with at least 11 non-missing responses to management questions and age 18-65. In this sample, we categorize employees into manager (middle and senior manager) and worker (other administrative staff (other office staff included), technician or design personnel, sales personnel, front-line worker, other staff). Average no. in each firm represents the average number of individuals across firms in each group. Average management score is the average management score of individuals in each group. Typical job title represents the most common job title in each group.