

How Do Equity Offerings Affect Firms? Evidence on Technology, Employees and Performance

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Equity Offerings

- Existing studies
 - Numerous event studies
 - Effects on leverage, cash balances, financial constraints, and Capex.
- We expand the scope by studying effects of SEOs on **Labor issues**
- Also on
 - technology adoption
 - Firm profitability and productivity

SEOs bring in equity capital and allow issuance of new debt

- How the infusion of capital affects firm-level employment depends on:
 - Scale effect => increase demand for workers
 - If capital is used to adopt new technology
 - Complementary effect => capital-skill complementarity increases demand for high skill workers.
 - Substitution effect => automation decreases demand for low-skilled workers.
- Net effect?
 - Depends on how the substitution effect offsets the scale and complementary effects.

Preview of Results

- Using regulatory shocks on the eligibility to issue public SEOs in China to construct an IV, we find SEOs lead to
 - Lower firm-level employment.
 - Displaced unskilled employees >> newly added skilled employees.
- Online job advertisements: SEOs are associated with higher demands for computer skills and non-routine task skills.

A Simple Model

- If the capital is used to adopt new technology, the effect on firm-level employment depends on the
 - Magnitude of productivity improvement brought about by the new technology
 - Elasticity of substitution between high and low skill workers.
 - If both are large enough, firm-level employment will decline
- Estimates of the elasticity of substitution > 2
- The decline in firm-level employment =>
 - Capital raised through SEOs help adopt new technology,
 - Which leads to large improvement in productivity

Consistent with the Predictions: SEOs Lead to

- More investments in technology-related tangible and intangible assets
- Higher profits
- Greater sales growth rate
- Higher worker and total factor productivity.
- Higher average wages due to higher employee skill composition.
- No significant changes in total wages due to fewer employees remaining after SEOs.
- Fewer but higher skilled workers using better technology w/o higher total wage bills => improve firm performance

Empirical Strategy

- China had regulatory shocks on the eligibility to issue SEOs in 2006 and 2008
 - Eligibility is based on the most-recent *past* three years' payout ratio.
 - Difficult for treated firms to circumvent the regulations.
 - Construct an IV using these shocks

The SEO Variable and Its Instrument

- SEO Variable: *SEO*
 - = 1 in SEO years, the year of receiving SEO proceeds and two years afterward
 - = 0 otherwise.
 - Only for public offerings.
- The instrument: *SEOIneligible*
 - Indicator for firms that became ineligible to receive SEO proceeds during the SEO years.

Validity of the Instrument

- Treatment is based on past payout ratios; treated and untreated firms may be different.
 - Control for the most-recent past three-year payout ratio.
- Pre-trends in outcome variables prior to the first shock in 2006: No difference.
- Anticipation and maneuvers to circumvent the regulations:
 - Check discontinuity in the threshold payout ratios required by the 2006 and 2008 regulatory changes.
 - No jump (McCrary test).

Baseline Specification

- Year- and firm fixed effects
- Past dividend payout ratios ($P3_PR$ and $P3_PR_D$)
- Legal Variables
 - Local Minimum wage ($\ln(MIN\ WAGE)$)
 - Local legal environment ($LAWSCORE$)
 - Effects of the 2008 Labor Law ($Labor_Law_Effect$)
- Firm Characteristics
 - Firm age ($\ln(NYEAR\ LISTED)$)
 - Firm size ($\ln(SALES)$)
 - State share ownership ($\%_STATE_OWN$)
 - Dividend payout ratio (DIV_PR)
 - Strength of corporate governance ($\%_LARGST_SH$ and $\%_IND_DIR$)
 - Asset tangibility (PPE/TA)
 - Financial leverage ($Leverage$)
 - Percentage of non-tradable shares ($\%_NONTRD_SH$)

Sample Construction

- Sample period: 2000–2012
 - Chinese labor markets resemble those of market-oriented economies.
 - Chinese economy and stock market both became the second largest in the world
- All A-share firms listed on the Shanghai and Shenzhen Stock Exchanges
 - Excluding financial firms, firms with fewer than 100 employees, and ST and ST* firms.

Data

- Chinese firms relied heavily on the stock market for external financing
 - Underdevelopment of Chinese corporate bond market.
 - 557 public SEOs during the sample period raising 404 billion RMB (2000) ,
 - 726 million RMB (US\$88M) per SEO.
- Publicly listed firms in China are required to disclose
 - payroll info in financial statements;
 - » **Reliable** data on firm-level wages and employment
 - employee composition by occupation and education
 - » Proxies for employee skills.
 - price of newly purchased assets by type
 - » Yearly investments in technology-related tangible and intangible assets.

Table 1: Sample and SEOs by Year

Year	Full	Number of SEOs
	(1)	(2)
2000	885	154
2001	951	131
2002	1,002	44
2003	1,059	38
2004	1,153	32
2005	1,172	7
2006	1,204	7
2007	1,323	28
2008	1,395	43
2009	1,485	18
2010	1,830	20
2011	2,120	23
2012	2,259	12
Total	17,838	557

Table 2: Summary Statistics

VARIABLES	Mean	Std. Dev.	Min	Max
SEO	0.088	0.283	0.000	1.000
SEO_Proceed (1,000,000)	725.902	1595.407	34.656	23947.61
SEOIneligible	0.155	0.362	0.000	1.000
EMP (100)	45.916	176.742	1.000	5528.100
Production	2228.760	9157.168	0.000	337036.000
Staff	320.840	1822.266	10.000	85228.000
Tech_R&D	650.142	3731.857	0.000	199531.000
S&M	503.142	2862.225	0.000	94476.000
Finance	95.998	472.648	0.000	14445.000
Others	861.889	5531.349	0.000	226361.000
Grad	124.597	767.276	0.000	24642.000
BA	868.775	4826.496	0.000	152840.000
NBA	4205.349	16702.3	8.000	427676.000
%_Production	0.483	0.284	0.000	0.997
%_Staff	0.093	0.109	0.001	0.998
%_Tech_R&D	0.175	0.158	0.000	0.987
%_S&M	0.130	0.162	0.000	0.996
%_Finance	0.034	0.035	0.000	0.788
%_Others	0.173	0.259	0.000	1.000
%_Grad	0.031	0.043	0.000	0.237
%_BA	0.202	0.178	0.000	0.959

Table 2 (Continued)

VARIABLES	Mean	Std. Dev.	Min	Max
Fixed_Tech (1,000,000)	148.853	1475.197	0.000	91309.090
Intangible_Tech (10,000)	978.125	6733.577	0.000	197295.200
Capx (1,000,000)	479.913	4753.238	0.001	247650.400
AWAGE (10,000)	6.928	11.691	0.013	658.944
AWAGE_NonExe (10,000)	7.054	12.352	0.011	723.361
AEXEPAY (10,000)	20.192	20.009	0.360	506.227
Payroll (1,000,000)	296.153	1908.561	0.039	108031.000
Payroll_NonExe (1,000,000)	306.816	1964.043	0.019	108015.900
Payroll_Exe (1,000,000)	2.876	3.534	0.022	111.370
ROA	0.035	0.111	-4.051	6.109
Sales_GR	0.228	0.497	-0.609	3.379
Sales/Employees (1,000,000)	1.105	2.878	0.000	130.867
TFP	0.003	0.336	-1.217	0.976
P3_PR	0.766	0.827	0.000	4.085
P3_PR_D	0.027	0.161	0.000	1.000
NYEAR_LISTED	7.011	5.013	0.000	22.000
Ln(MIN_WAGE)	640.329	207.828	208.540	1085.329
LAWSCORE	7.784	3.916	0.000	16.610
Labor_Law_Effect	3.689	3.850	0.000	13.312
SALES (1,000,000)	4517.473	39862.920	0.003	2085363.000
%_LARGEST_SH	0.390	0.163	0.022	0.894
DIV_PR	0.259	0.306	0.000	1.500
%_STATE_OWN	0.215	0.252	0.000	0.886
%_IND_DIR	0.306	0.127	0.000	0.833
%_NONTRD_SH	0.212	0.296	0.000	0.913
LEVERAGE	0.456	0.201	0.047	0.889
PPE/TA	0.320	0.201	0.000	0.975

Empirical Results and Theoretical Framework

- Total Firm-level Employment and Employees by Occupation or Education
- Employee Composition by Occupation or Education
- Theoretical Framework
- Technology Adoption, Wages, and Firm Performance
- Robustness Checks
- Demand for Skills

First-stage estimation

- Endogenous variable, SEO years, is an indicator.
- Conditional (fixed-effects) logistic regression
 - IV estimators are asymptotically efficient (Wooldridge, 2010)

	SEO
SEOIeligible	-1.434***
	(0.371)
Full control variables	Y
Firm & Year FE	Y
Observations	5,251

- F-statistic = 14.06 when estimated by the OLS

Table 3: Total Firm-Level Employment

	Ln(EMP)	Ln(Production)	Ln(Staff)	Ln(Tech_R&D)	Ln(S&M)
$\widehat{SE0}$	-0.091**	-0.252**	-0.463***	0.133**	0.103*
	(0.043)	(0.102)	(0.097)	(0.056)	(0.062)
Full Control Variables	Y	Y	Y	Y	Y
Firm & Year FE	Y	Y	Y	Y	Y
Observations	16,964	16,964	16,964	13,916	10,576

(Continued)

	Ln(Finance)	Ln(Others)	Ln(Grad)	Ln(BA)	Ln(NBA)
$\widehat{SE0}$	0.008	-0.070	0.111*	0.004	-0.174***
	(0.052)	(0.218)	(0.065)	(0.061)	(0.053)
Full Control Variables	Y	Y	Y	Y	Y
Firm & Year FE	Y	Y	Y	Y	Y
Observations	13,326	16,964	8,109	11,650	11,650

Skill Variables

- By Occupation
 - High skill workers
 - Technicians and R&D staff (*Tech_R&D*)
 - Sales and marketing force (*S&M*)
 - Low skill workers
 - Production workers(*Production*)
 - Support staff (*Staff*)
- By Education
 - High skill workers
 - Holders of post-graduate degrees (*Grad*)
 - Holders of 4-year university bachelor's degrees and above (*BA*)
 - Low skill workers
 - No 4-year university bachelor's degree (*NBA*)

Table 3: Firm-Level Employment by Occupation and Education

	Ln(EMP)	Ln(Production)	Ln(Staff)	Ln(Tech_R&D)	Ln(S&M)
$\widehat{SE0}$	-0.091** (0.043)	-0.252** (0.102)	-0.463*** (0.097)	0.133** (0.056)	0.103* (0.062)
Full Control Variables	Y	Y	Y	Y	Y
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Full Control Variables	Y	Y	Y	Y	Y
Firm & Year FE	Y	Y	Y	Y	Y
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- Total Firm-level Employment and Employees by Occupation or Education
- **Employee Composition by Occupation or Education**
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Table 4: Employee Composition by Occupation or Education

	%_Production	%_Staff	%_Tech_R&D	%_S&M
\widehat{SEO}	-0.037***	-0.011*	0.038***	0.023***
	(0.014)	(0.007)	(0.010)	(0.005)
Full Control Variables	Y	Y	Y	Y
Firm & Year FE	Y	Y	Y	Y
Observations	16,964	16,964	13,916	10,576

(Continued)

	%_Finance	%_Others	%_Grad	%_BA
\widehat{SEO}	0.004*	0.007	0.006**	0.018**
	(0.002)	(0.018)	(0.003)	(0.007)
Full Control Variables	Y	Y	Y	Y
Firm & Year FE	Y	Y	Y	Y
Observations	13,326	16,964	8,109	11,650

Table 4: Employee Composition by Occupation or Education

	%_Production	%_Staff	%_Tech_R&D	%_S&M
\widehat{SEO}	-0.037*** (0.014)	-0.011* (0.007)	0.038*** (0.010)	0.023*** (0.005)
Full Control Variables	Y	Y	Y	Y
Firm & Year FE	Y	Y	Y	Y
Observations	16,964	16,964	13,916	10,576

(Continued)

	%_Finance	%_Others	%_Grad	%_BA
\widehat{SEO}	0.004* (0.002)	0.007 (0.018)	0.006** (0.003)	0.018** (0.007)
Full Control Variables	Y	Y	Y	Y
Firm & Year FE	Y	Y	Y	Y
Observations	13,326	16,964	8,109	11,650

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A Simple Model

- Assumption: SEOs facilitate technology adoption by relaxing financial constraints
 - Financially constrained firms invest less and spend less on technology
 - Rauh (2006) and Campello, Graham, and Harvey (2010)
 - The primary role of equity offerings is to relax financial constraints
 - DeAngelo, DeAngelo, and Stulz (2010) and Borisov, Ellul, and Sevilir (2017)
- Technology Adoption
 - Improves productivity
 - Requires one-time investment in sunk cost

Setup

Machines (A), high skill workers (H), and low skill workers (L) produce 2 intermediate inputs:

- 1: $\varepsilon A^\alpha H^{1-\alpha}$
 - ε : the productivity of high skill workers with machines
 - α : share of machines in the production
- 2: L
- Production of final goods is a CES aggregation of 1 and 2:

$$\left[(\varepsilon A^\alpha H^{1-\alpha})^{\frac{\sigma-1}{\sigma}} + L^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}$$

- σ : the elasticity of substitution between the two intermediate inputs

The firm faces budget constraints

- K : The current cash balance < the cost of new technology
- ΔK : external capital raised through an SEO
 - Proceeds from the SEO + incremental debt supported by higher equity base

Firms' Profit-Maximization Problem

Before an SEO:

$$\max_{A,H,L} p \left[(\varepsilon A^\alpha H^{1-\alpha})^{\frac{\sigma-1}{\sigma}} + L^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}} - rA - wH - L$$
$$\text{s.t. } rA + wH + L = K$$

⇒ Optimal level of inputs: A_1^* , H_1^* , and L_1^*

An SEO allows purchase of technology, which improves productivity by ϕ :

$$\max_{A,H,L} p \left[((\varepsilon + \phi) A^\alpha H^{1-\alpha})^{\frac{\sigma-1}{\sigma}} + L^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}} - rA - wH - L$$
$$\text{s.t. } rA + wH + L = K + \Delta K - C(\phi)$$

⇒ New optimal level of inputs: A_2^* , H_2^* , and L_2^*

Proposition

If a firm upgrades technology after an SEO and $\sigma > 1$,

$$A_2^* > A_1^* \text{ and } H_2^* > H_1^*$$

- Existing estimates of the elasticity > 1
 - Estimates of our sample show an elasticity > 2 .
- (1) there exists a $\bar{\phi}$, such that

$$L_1^* > L_2^*, \text{ when } \phi > \bar{\phi}$$

- (2) there exists a ϕ^* , such that

$$H_1^* + L_1^* > H_2^* + L_2^*, \text{ when } \phi > \phi^*$$

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Technology Adoption

Two proxies: Expenditures on

- Technology-related fixed assets
 - machines and equipment
- Technology-related intangible assets
 - computer software, technology with or without patents, patents, and information management systems
 - We exclude intangible assets not directly related to technology, such as goodwill, rights to land use, and franchising.

Table 5: Technology Adoption

	Ln(Fixed_Tech)	Ln(Intangible_Tech)	Ln(Capex)
\widehat{SEO}	0.272*** (0.094)	0.363* (0.188)	0.265*** (0.091)
Ln(NYEAR_LISTED)	-0.192*** (0.047)	0.206 (0.161)	-0.435*** (0.040)
Ln(MIN_WAGE)	0.029 (0.183)	-0.087 (0.556)	0.013 (0.118)
LAWSCORE	-0.030 (0.020)		-0.006 (0.010)
Labor_Law_Effect	-0.030*** (0.011)	0.004 (0.034)	-0.041*** (0.009)
Additional Control Variables	Y	Y	Y
Firm & Year FE	Y	Y	Y
Observations	14,453	6,187	17,099

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Additional Control Variables	Y	Y	Y
Firm & Year FE	Y	Y	Y
Observations	14,453	6,187	17,099

Table 6: Firm Performance

	ROA	Sales_GR	Sales/Employees	TFP
\widehat{SEO}	0.018*** (0.007)	0.213*** (0.041)	0.847** (0.425)	0.094*** (0.027)
Ln(NYEAR_LISTED)	-0.012*** (0.003)	-0.124*** (0.017)	-0.340*** (0.102)	-0.095*** (0.013)
Ln(MIN_WAGE)	0.008 (0.007)	-0.104* (0.056)	0.111 (0.154)	0.044 (0.033)
LAWSCORE	-0.002*** (0.001)	-0.010** (0.004)	0.158*** (0.029)	-0.006** (0.003)
Labor_Law_Effect	0.002*** (0.000)	0.005 (0.004)	0.003 (0.011)	-0.002 (0.002)
<u>Additional Control Variables</u>	Y	Y	Y	Y
Firm & Year FE	Y	Y	Y	Y
Observations	16,916	17,136	16,964	16,827

Table 7: Average Wages

	Ln(AWAGE)	Ln(AWAGE_NonExe)	Ln(AEXEPAY)
$\widehat{SE0}$	0.065* (0.037)	0.089** (0.044)	0.025 (0.032)
Ln(NYEAR_LISTED)	-0.009 (0.013)	-0.016 (0.021)	-0.075*** (0.017)
Ln(MIN_WAGE)	0.296*** (0.047)	0.295*** (0.051)	0.176*** (0.050)
LAWSCORE	-0.007* (0.004)	-0.006 (0.006)	-0.030*** (0.005)
Labor_Law_Effect	0.003 (0.003)	0.001 (0.004)	0.014*** (0.003)
Additional Control Variables	Y	Y	Y
Firm & Year FE	Y	Y	Y
Observations	16,960	16,026	16,026

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Ln(MIN_WAGE)	0.296*** (0.047)	0.295*** (0.051)	0.176*** (0.050)
LAWSCORE	-0.007* (0.004)	-0.006 (0.006)	-0.030*** (0.005)
Labor_Law_Effect	0.003 (0.003)	0.001 (0.004)	0.014*** (0.003)
Additional Control Variables	Y	Y	Y
Firm & Year FE	Y	Y	Y
Observations	16,960	16,026	16,026

Table 8: Total Wages

	Ln(Payroll)	Ln(Payroll_NonExe)	Ln(Payroll_Exe)
$\widehat{SE0}$	-0.035 (0.035)	-0.033 (0.034)	0.011 (0.033)
Ln(NYEAR_LISTED)	0.107*** (0.015)	0.109*** (0.015)	-0.060*** (0.021)
Ln(MIN_WAGE)	0.021 (0.047)	0.001 (0.042)	0.116** (0.051)
LAWSCORE	-0.020*** (0.003)	-0.021*** (0.004)	-0.022*** (0.004)
Labor_Law_Effect	-0.001 (0.003)	0.000 (0.003)	0.015*** (0.004)
Additional Control Variables	Y	Y	Y
Firm & Year FE	Y	Y	Y
Observations	17,131	16,152	16,152

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LAWSCORE	-0.020*** (0.003)	-0.021*** (0.004)	-0.022*** (0.004)
Labor_Law_Effect	-0.001 (0.003)	0.000 (0.003)	0.015*** (0.004)
Additional Control Variables	Y	Y	Y
Firm & Year FE	Y	Y	Y
Observations	17,131	16,152	16,152

Empirical Results and Theoretical Framework

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Table 9: Results of Pre-trend Placebo Tests

	Ln(EMP)	Ln (Production)	Ln(Staff)	Ln (Tech_R&D)	Ln(S&M)	Ln (Finance)	Ln(Others)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Affected×Year01	0.015 (0.034)	0.071 (0.100)	-0.132 (0.107)	-0.002 (0.055)	-0.000 (0.063)	0.056 (0.041)	-0.380 (0.239)
Affected×Year02	-0.017 (0.040)	0.001 (0.112)	-0.130 (0.124)	-0.012 (0.064)	-0.102 (0.073)	0.021 (0.049)	-0.305 (0.266)
Affected×Year03	-0.011 (0.044)	-0.024 (0.119)	-0.132 (0.130)	-0.102 (0.072)	-0.114 (0.081)	0.052 (0.054)	-0.449 (0.275)
Affected×Year04	-0.025 (0.050)	-0.081 (0.129)	-0.105 (0.138)	-0.043 (0.076)	-0.132 (0.084)	0.025 (0.060)	-0.379 (0.297)
Affected×Year05	-0.009 (0.053)	-0.015 (0.139)	-0.161 (0.155)	-0.075 (0.081)	-0.132 (0.096)	0.049 (0.063)	-0.261 (0.316)
Firm FE, Year FE, and Full controls	Y	Y	Y	Y	Y	Y	Y
Observations	5,683	5,683	5,683	4,787	4,642	4,799	5,683
Adjusted R-squared	0.922	0.807	0.603	0.813	0.876	0.872	0.574

Table 9: Results of Pre-trend Placebo Tests (Continued)

	Ln(Grad)	Ln(BA)	Ln(NBA)	Ln (Fixed_Tech)	ROA	SALES_GR	Sales/Emp
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Affected×Year01	0.110 (0.160)	0.032 (0.091)	0.029 (0.070)		-0.008 (0.006)	0.028 (0.052)	-0.060 (0.093)
Affected×Year02	0.098 (0.176)	0.023 (0.102)	0.005 (0.087)		-0.010 (0.006)	0.021 (0.058)	-0.107 (0.130)
Affected×Year03	0.001 (0.185)	-0.064 (0.106)	0.018 (0.095)		-0.010 (0.007)	0.053 (0.061)	-0.263 (0.220)
Affected×Year04	-0.079 (0.192)	-0.175 (0.115)	0.026 (0.107)	-0.007 (0.143)	-0.010 (0.008)	0.102 (0.065)	-0.220 (0.141)
Affected×Year05	-0.044 (0.204)	-0.189 (0.117)	0.011 (0.114)	-0.150 (0.158)	-0.012 (0.008)	0.104 (0.065)	-0.229 (0.155)
Firm FE, Year FE, and Full controls	Y	Y	Y	Y	Y	Y	Y
Observations	2,043	2,936	2,936	3,084	5,636	5,767	5,683
Adjusted R-squared	0.891	0.907	0.956	0.739	0.470	0.185	0.817

Table 9: Results of Pre-trend Placebo Tests (Continued)

	TFP	Ln(AWAGE)	Ln(Payroll)
	(15)	(16)	(17)
Affected×Year01	-0.018 (0.026)	-0.058 (0.038)	-0.027 (0.031)
Affected×Year02	-0.006 (0.029)	-0.034 (0.040)	-0.038 (0.035)
Affected×Year03	0.032 (0.031)	-0.062 (0.042)	-0.060 (0.037)
Affected×Year04	0.053 (0.033)	-0.069 (0.048)	-0.080* (0.044)
Affected×Year05	0.046 (0.034)	-0.059 (0.051)	-0.055 (0.047)
Firm FE, Year FE, and Full controls	Y	Y	Y
Observations	5,609	5,680	5,763
Adjusted R-squared	0.696	0.855	0.944

Table 10: Alternative Ways to Construct the Instrument and Definition of SEOs

DEPENDENT VARIABLES	IV based on treatments only in 2006 and 2008	Using one-year lag	IV based only on the 2006 regulation	Excluding small SEOs
(1)	(2)	(3)	(4)	(5)
Ln(EMP)	-0.081** (0.038)	-0.094** (0.047)	-0.092** (0.046)	-0.095** (0.048)
N	16,964	16,964	16,964	16,964
Ln(Production)	-0.232** (0.098)	-0.279** (0.109)	-0.092** (0.046)	-0.254** (0.102)
N	16,964	16,964	16,964	16,964
Ln(Staff)	-0.456*** (0.105)	-0.509*** (0.108)	-0.467*** (0.121)	-0.478*** (0.109)
N	16,964	16,964	16,964	16,964
Ln(Tech_R&D)	0.111* (0.060)	0.116* (0.067)	0.077 (0.057)	0.127** (0.060)
N	13,916	13,916	13,916	13,916
Ln(S&M)	0.103* (0.059)	0.077 (0.081)	0.074 (0.069)	0.104* (0.061)
N	10,576	10,576	10,576	10,576
Ln(Finance)	0.003 (0.053)	0.007 (0.057)	0.006 (0.056)	0.006 (0.048)
N	13,326	13,326	13,326	13,326
Ln(Others)	-0.075 (0.183)	-0.016 (0.225)	-0.055 (0.203)	-0.056 (0.211)
N	16,964	16,964	16,964	16,964
Ln(Grad)	0.108* (0.058)	0.117* (0.064)	0.117* (0.067)	0.109* (0.057)
N	8,109	8,109	8,109	8,109
Ln(BA)	-0.023 (0.056)	-0.036 (0.056)	-0.038 (0.062)	0.002 (0.065)
N	11,650	11,650	11,650	11,650
Ln(NBA)	-0.163*** (0.047)	-0.171*** (0.063)	-0.164*** (0.050)	-0.183*** (0.043)
N	11,650	11,650	11,650	11,650

Table 10: Alternative Ways to Construct the Instrument and Definition of SEOs
(Continued)

DEPENDENT VARIABLES	IV based on treatments only in 2006 and 2008	Using one-year lag	IV based only on the 2006 regulation	Excluding small SEOs
(1)	(2)	(3)	(4)	(5)
Ln(Fixed_Tech)	0.272** (0.115)	0.245** (0.106)	0.240** (0.122)	0.286** (0.133)
N	14,453	14,453	14,453	14,453
Ln(Intangible_Tech)	0.353* (0.199)	0.334 (0.283)	0.432 (0.269)	0.387 (0.237)
N	6,187	6,187	6,187	6,187
Ln(AWAGE)	0.062 (0.040)	0.066* (0.040)	0.065* (0.037)	0.064* (0.037)
N	16,960	16,960	16,960	16,960
Ln(Payroll)	-0.026 (0.037)	-0.040 (0.028)	-0.037 (0.037)	-0.041 (0.034)
N	17,131	17,131	17,131	17,131
ROA	0.018** (0.007)	0.018*** (0.006)	0.022*** (0.005)	0.019*** (0.006)
N	16,916	16,916	16,916	16,916
Sales_GR	0.206*** (0.049)	0.233*** (0.047)	0.240*** (0.041)	0.220*** (0.042)
N	17,136	17,136	17,136	17,136
Sales/Employees	0.841* (0.441)	0.894* (0.533)	0.909* (0.549)	0.857* (0.489)
N	16,964	16,964	16,964	16,964
TFP	0.085*** (0.028)	0.091** (0.035)	0.104*** (0.033)	0.100*** (0.026)
N	16,827	16,827	16,827	16,827

Empirical Results and Theoretical Framework

- Total Firm-level Employment and Employees by Occupation or Education
- Employee Composition by Occupation or Education
- Theoretical Framework
- Technology Adoption, Wages, and Firm Performance
- Robustness Checks
- Demand for Skills

Demand for Skills

- Job posting data from Lagou.com (<https://www.lagou.com>), a major job posting company in China
- Sample period: 2014–2016
- For each job advertisement, we construct 4 types of skills by machine-searching for the keywords (Hershbein and Kahn, 2018)
 - advanced computer skills
 - basic computer skills
 - non-routine analytical task skills
 - non-routine interactive task skills

Table 11: SEOs and the Demand for Computer Skills

Panel A: Advanced Computer Skills

VARIABLES	Adv_Computer_Dum		Ln(Adv_Computer)	
	(1)	(2)	(3)	(4)
JP_SEO	0.183***	0.153**	0.059***	0.042***
	(0.060)	(0.063)	(0.017)	(0.012)
Constant	2.033***	1.122**	1.855***	1.215***
	(0.779)	(0.481)	(0.293)	(0.115)
Year Dummies	Y	Y	Y	Y
Firm Dummies	Y	Y	Y	Y
Location Dummies	Y	Y	Y	Y
Job Dummies	N	Y	N	Y
Observations	44,767	44,767	45,582	45,582
Pseudo-R ²	0.078	0.297		
Adjusted R ²			0.101	0.398

Panel B: Basic Computer Skills

VARIABLES	Basic_Computer_Dum		Ln(Basic_Computer)	
	(1)	(2)	(3)	(4)
JP_SEO	0.370**	0.381***	0.008**	0.008**
	(0.148)	(0.146)	(0.004)	(0.003)
Constant	-4.514***	-3.880***	0.018	0.048**
	(1.196)	(1.183)	(0.015)	(0.019)
Year Dummies	Y	Y	Y	Y
Firm Dummies	Y	Y	Y	Y
Location Dummies	Y	Y	Y	Y
Job Dummies	N	Y	N	Y
Observations	40,218	40,218	45,582	45,582
Pseudo-R ²	0.085	0.120		
Adjusted R ²			0.032	0.045

Table 12: SEOs and the Demand for Non-routine Analytical and Interactive Task Skills

Panel A: Non-routine Analytic Task Skills

VARIABLES	Non-routine Analytical Task Skills_Dum		Ln(Non-routine Analytical Task Skills)	
	(1)	(2)	(3)	(4)
JP_SEO	0.166***	0.169***	0.022*	0.022
	(0.057)	(0.058)	(0.013)	(0.013)
Constant	0.578	0.373	0.524***	0.419**
	(0.365)	(0.380)	(0.125)	(0.164)
Year Dummies	Y	Y	Y	Y
Firm Dummies	Y	Y	Y	Y
Location Dummies	Y	Y	Y	Y
Job Dummies	N	Y	N	Y
Observations	44,992	44,992	45,582	45,582
Pseudo-R ²	0.072	0.090		
Adjusted R ²			0.082	0.115

Panel B: Non-routine Interactive Task Skills

VARIABLES	Non-routine Interactive Task Skills_Dum		Ln(Non-routine Interactive Task Skills)	
	(1)	(2)	(3)	(4)
JP_SEO	0.110*	0.143**	0.015	0.024**
	(0.061)	(0.063)	(0.011)	(0.011)
Constant	2.490***	3.030***	0.959***	1.215***
	(0.545)	(0.608)	(0.158)	(0.205)
Year Dummies	Y	Y	Y	Y
Firm Dummies	Y	Y	Y	Y
Location Dummies	Y	Y	Y	Y
Job Dummies	N	Y	N	Y
Observations	44,214	44,214	45,582	45,582
Pseudo-R ²	0.052	0.096		
Adjusted R ²			0.069	0.156

Good News

- Highly developed, sophisticated and global financial markets of recent years
 - => Easier access to capital
 - => Increasing demand for skills.
- Greater demand for skills may stimulates the supply of skilled workers.
- More skilled workers, more development of skill complementary technologies,
 - e.g., self-driving cars.
- Good for economic growth.

The Short-run

- Easier access to capital => more displacement of low-skilled and less-educated workers,
 - who may not be able to leave the shrinking market for their services,
 - lowering their wages.
- High-skilled and/or highly-educated employees will find greater demand for their services, leading to higher wages.
- Greater income inequality

The Long-run

- Greater profits and higher productivity will lead to
 - development of complementary technologies/ processes to harness the recent technological advances to yield their full economic benefits
- Creating new job opportunities
 - E.g., tertiary services (Autor and Salomons, 2017)
- Need to help low skill workers to make the necessary transition for new job opportunities.

China Urban Household survey (2000-2009) of Nine Provinces

Appendix 7: Average Annual Wages in China by Education and Occupation

Year	Education			Occupation				
	College or above	High School	Middle School or below	Technician	Production Worker	Staff or Service Workers	Agricultural Workers	Other
2000	11084.013	8944.776	5139.363	15239.261	9258.860	11053.963	8566.029	7946.278
2001	11976.958	9554.838	5438.288	16852.991	9864.254	11841.001	9827.922	8882.542
2002	15822.367	10409.411	5757.975	18404.414	10912.095	13807.288	9452.208	9661.626
2003	17728.367	11346.542	5975.318	20489.257	12303.120	15216.043	10937.459	11118.318
2004	19451.303	12139.160	6495.877	23086.913	13622.273	16191.782	12360.412	12257.059
2005	21261.428	13013.126	7123.790	25598.902	14743.270	18072.238	15012.060	14361.187
2006	23030.351	14092.422	7931.302	27949.907	16697.195	19682.444	16756.711	15198.924
2007	24665.948	15261.617	8603.666	29624.443	17833.485	21563.516	18206.153	17030.791
2008	27924.529	16415.125	9329.643	32551.162	20094.639	23523.721	19247.500	20093.954
2009	30928.259	18155.407	10323.152	35799.283	22402.561	26124.442	23231.018	20988.433

Table 4 (Continued)

VARIABLES	%_Production	%_Staff	%_Tech_R&D	%_S&M
	(1)	(2)	(3)	(4)
SE0	-0.037*** (0.014)	-0.011* (0.007)	0.038*** (0.010)	0.023*** (0.005)
P3_PR	0.005** (0.003)	0.002* (0.001)	-0.001 (0.001)	0.000 (0.001)
P3_PR_D	0.001 (0.009)	0.002 (0.004)	-0.010** (0.004)	0.001 (0.003)
Ln(NYEAR_LISTED)	-0.002 (0.007)	-0.004 (0.004)	-0.011** (0.005)	-0.009** (0.004)
Ln(MIN_WAGE)	0.004 (0.019)	0.006 (0.008)	-0.003 (0.013)	-0.002 (0.012)
LAWSCORE	0.003* (0.002)	-0.000 (0.001)	0.002** (0.001)	0.000 (0.001)
Labor_Law_Effect	-0.006*** (0.001)	0.002*** (0.001)	0.001 (0.001)	-0.003*** (0.001)
Ln(SALES)	0.003 (0.003)	-0.006*** (0.002)	-0.004** (0.002)	0.002 (0.002)
%_LARGEST_SH	-0.055** (0.025)	0.036*** (0.011)	0.027 (0.018)	0.024* (0.014)
DIV_PR	0.001 (0.003)	0.000 (0.001)	-0.001 (0.002)	-0.000 (0.001)
%_STATE_OWN	-0.003 (0.011)	-0.013*** (0.005)	-0.008 (0.005)	-0.023*** (0.005)
%_IND_DIR	-0.054*** (0.019)	0.013* (0.008)	0.029*** (0.010)	0.034*** (0.012)
%_NONTRD_SH	-0.001 (0.018)	0.004 (0.008)	-0.006 (0.008)	-0.006 (0.011)
Leverage	-0.081*** (0.015)	0.016* (0.010)	-0.001 (0.012)	0.003 (0.007)
PPE/TA	0.168*** (0.018)	-0.012 (0.009)	-0.030** (0.012)	-0.054*** (0.017)
Constant	0.464*** (0.112)	0.047 (0.047)	0.214** (0.086)	0.146** (0.067)
Firm & Year FE	Y	Y	Y	Y
Observations	16,964	16,964	13,916	10,576

Table 4 (Continued)

VARIABLES	%_Finance	%_Others	%_Grad	%_BA
	(5)	(6)	(7)	(8)
S&O	0.004* (0.002)	0.007 (0.018)	0.006** (0.003)	0.018** (0.007)
P3_PR	-0.001*** (0.000)	-0.008*** (0.003)	-0.000 (0.000)	0.001 (0.001)
P3_PR_D	-0.002** (0.001)	0.002 (0.010)	0.000 (0.001)	-0.010** (0.004)
Ln(NYEAR_LISTED)	-0.001 (0.001)	0.023** (0.009)	-0.002 (0.002)	-0.002 (0.005)
Ln(MIN_WAGE)	0.001 (0.002)	0.008 (0.025)	0.005 (0.003)	0.038*** (0.011)
LAWSCORE	-0.000 (0.000)	-0.007*** (0.002)	-0.000 (0.000)	0.001 (0.001)
Labor_Law_Effect	0.001 (0.000)	0.004** (0.002)	-0.001*** (0.000)	-0.005*** (0.001)
Ln(SALES)	-0.002*** (0.001)	0.004 (0.004)	-0.001 (0.001)	-0.003 (0.002)
%_LARGEST_SH	0.018*** (0.003)	0.012 (0.027)	0.007* (0.004)	0.067*** (0.017)
DIV_PR	-0.000 (0.000)	0.000 (0.004)	-0.000 (0.001)	-0.000 (0.001)
%_STATE_OWN	-0.002 (0.001)	0.019* (0.011)	-0.003 (0.002)	0.002 (0.007)
%_IND_DIR	-0.002 (0.003)	0.010 (0.024)	-0.003 (0.003)	-0.014 (0.012)
%_NONTRD_SH	0.000 (0.002)	0.008 (0.017)	0.005 (0.003)	-0.011 (0.010)
Leverage	0.009*** (0.002)	0.049*** (0.019)	0.004 (0.003)	0.009 (0.010)
PPE/TA	-0.024*** (0.002)	-0.113*** (0.023)	-0.015*** (0.003)	-0.084*** (0.013)
Constant	0.033*** (0.013)	0.129 (0.148)	0.006 (0.022)	-0.048 (0.070)
Firm & Year FE	Y	Y	Y	Y
Observations	13,326	16,964	8,109	11,650

Table 3 (Continued)

VARIABLES	Ln(EMP)	Ln(Production)	Ln(Staff)	Ln(Tech_R&D)	Ln(S&M)
	(1)	(2)	(3)	(4)	(5)
SE0	-0.091** (0.043)	-0.252** (0.102)	-0.463*** (0.097)	0.133** (0.056)	0.103* (0.062)
P3_PR	0.011* (0.006)	0.045*** (0.014)	0.038** (0.015)	0.002 (0.010)	0.016 (0.015)
P3_PR_D	-0.017 (0.024)	-0.025 (0.056)	0.063 (0.073)	-0.063* (0.033)	0.035 (0.033)
Ln(NYEAR_LISTED)	0.117*** (0.022)	0.129** (0.058)	0.138** (0.057)	0.076** (0.032)	0.076** (0.034)
Ln(MIN_WAGE)	-0.265*** (0.058)	-0.175 (0.117)	-0.213* (0.116)	-0.227*** (0.075)	-0.106 (0.086)
LAWSCORE	-0.012** (0.005)	0.011 (0.011)	0.005 (0.012)	0.003 (0.007)	0.014* (0.008)
Labor_Law_Effect	-0.004 (0.003)	-0.041*** (0.008)	0.011 (0.011)	0.006 (0.006)	-0.025** (0.012)
Ln(SALES)	0.421*** (0.012)	0.326*** (0.027)	0.259*** (0.016)	0.396*** (0.016)	0.415*** (0.016)
%_LARGEST_SH	-0.094 (0.075)	-0.273* (0.163)	0.242** (0.123)	0.023 (0.109)	0.082 (0.136)
DIV_PR	0.005 (0.010)	0.008 (0.013)	0.008 (0.021)	0.002 (0.012)	-0.002 (0.013)
%_STATE_OWN	0.125*** (0.028)	0.007 (0.076)	0.074 (0.084)	0.076 (0.054)	-0.007 (0.091)
%_IND_DIR	0.039 (0.043)	-0.190* (0.112)	-0.042 (0.116)	0.227*** (0.081)	0.192** (0.085)
%_NONTRD_SH	0.040 (0.044)	0.046 (0.092)	-0.102 (0.105)	-0.077 (0.062)	-0.056 (0.048)
Leverage	0.261*** (0.041)	-0.130 (0.115)	0.276*** (0.105)	0.208*** (0.059)	0.202** (0.098)
PPE/TA	0.530*** (0.050)	0.963*** (0.114)	0.451*** (0.094)	0.272*** (0.073)	-0.236** (0.114)
Constant	1.455*** (0.348)	4.976*** (0.728)	3.113*** (0.703)	4.067*** (0.474)	2.770*** (0.527)
Firm & Year FE	Y	Y	Y	Y	Y
Observations	16,964	16,964	16,964	13,916	10,576

Table 3 (Continued)

VARIABLES	Ln(Finance) (6)	Ln(Others) (7)	Ln(Grad) (8)	Ln(BA) (9)	Ln(NBA) (10)
SEO	0.008 (0.052)	-0.070 (0.218)	0.111* (0.065)	0.004 (0.061)	-0.174*** (0.053)
P3_PR	-0.004 (0.008)	-0.030 (0.031)	-0.021* (0.011)	0.018 (0.012)	0.014* (0.007)
P3_PR_D	-0.035 (0.024)	0.052 (0.129)	-0.075 (0.053)	-0.079** (0.034)	0.002 (0.030)
Ln(NYEAR_LISTED)	0.069*** (0.023)	0.445*** (0.107)	0.040 (0.048)	0.054* (0.030)	0.130*** (0.027)
Ln(MIN_WAGE)	-0.160*** (0.058)	0.036 (0.239)	0.255** (0.121)	-0.002 (0.091)	-0.432*** (0.084)
LAWSCORE	-0.011** (0.005)	-0.069*** (0.022)	-0.022* (0.013)	-0.009 (0.008)	-0.023*** (0.009)
Labor_Law_Effect	0.002 (0.005)	0.050*** (0.017)	-0.037*** (0.005)	-0.020*** (0.005)	0.012** (0.005)
Ln(SALES)	0.319*** (0.012)	0.325*** (0.036)	0.393*** (0.020)	0.421*** (0.015)	0.446*** (0.016)
%_LARGEST_SH	0.131* (0.074)	0.084 (0.316)	-0.092 (0.138)	0.074 (0.110)	-0.346** (0.142)
DIV_PR	0.003 (0.010)	-0.004 (0.019)	-0.002 (0.016)	0.005 (0.013)	0.006 (0.009)
%_STATE_OWN	0.060* (0.035)	0.221* (0.123)	0.023 (0.055)	0.148*** (0.050)	0.143*** (0.045)
%_IND_DIR	0.079 (0.049)	0.150 (0.186)	0.034 (0.097)	0.023 (0.084)	0.063 (0.075)
%_NONTRD_SH	-0.012 (0.041)	0.027 (0.167)	-0.016 (0.090)	-0.034 (0.058)	0.037 (0.062)
Leverage	0.429*** (0.051)	0.581*** (0.223)	0.228** (0.110)	0.267*** (0.066)	0.239*** (0.064)
PPE/TA	-0.078 (0.049)	-0.501** (0.213)	-0.056 (0.118)	0.178** (0.085)	0.702*** (0.089)
Constant	2.387*** (0.359)	1.118 (1.532)	-1.390* (0.771)	2.148*** (0.555)	6.701*** (0.520)
Firm & Year FE	Y	Y	Y	Y	Y
Observations	13,326	16,964	8,109	11,650	11,650

Table 5: Technology Adoption

VARIABLES	Ln(Fixed_Tech)	Ln(Intangible_Tech)	Ln(Capx)
	(1)	(2)	(3)
SEO	0.272*** (0.094)	0.363* (0.188)	0.265*** (0.091)
P3_PR	0.005 (0.019)	-0.031 (0.050)	0.050*** (0.014)
P3_PR_D	-0.149*** (0.057)	0.315 (0.252)	-0.399*** (0.060)
Ln(NYEAR_LISTED)	-0.192*** (0.047)	0.206 (0.161)	-0.435*** (0.040)
Ln(MIN_WAGE)	0.029 (0.183)	-0.087 (0.556)	0.013 (0.118)
LAWSCORE	-0.030 (0.020)		-0.006 (0.010)
Labor_Law_Effect	-0.030*** (0.011)	0.004 (0.034)	-0.041*** (0.009)
Ln(SALES)	0.552*** (0.025)	0.443*** (0.091)	0.801*** (0.024)
%_LARGEST_SH	0.237 (0.167)	0.340 (0.746)	0.476*** (0.169)
DIV_PR	0.001 (0.024)	0.003 (0.044)	0.008 (0.019)
%_STATE_OWN	0.128* (0.066)	0.316 (0.200)	0.085 (0.053)
%_IND_DIR	-0.044 (0.186)	-0.221 (0.417)	0.199 (0.132)
%_NONTRD_SH	-0.148* (0.085)	-0.765 (1.364)	-0.655*** (0.104)
Leverage	0.693*** (0.128)	0.103 (0.412)	0.044 (0.111)
PPE/TA	2.225*** (0.154)	0.658 (0.408)	2.862*** (0.117)
Constant	-2.332** (1.166)	0.825 (3.413)	-1.788*** (0.692)
Firm & Year FE	Y	Y	Y
Observations	14,453	6,187	17,099

Table 6: Firm Performance

VARIABLES	ROA	Sales_GR	Sales/Employees	TFP
	(1)	(2)	(3)	(4)
SE0	0.018*** (0.007)	0.213*** (0.041)	0.847** (0.425)	0.094*** (0.027)
P3_PR	-0.002*** (0.000)	-0.024*** (0.005)	-0.023 (0.024)	-0.001 (0.004)
P3_PR_D	-0.014** (0.006)	0.026 (0.026)	0.052 (0.063)	-0.027* (0.015)
Ln(NYEAR_LISTED)	-0.012*** (0.003)	-0.124*** (0.017)	-0.340*** (0.102)	-0.095*** (0.013)
Ln(MIN_WAGE)	0.008 (0.007)	-0.104* (0.056)	0.111 (0.154)	0.044 (0.033)
LAWSCORE	-0.002*** (0.001)	-0.010** (0.004)	0.158*** (0.029)	-0.006** (0.003)
Labor_Law_Effect	0.002*** (0.000)	0.005 (0.004)	0.003 (0.011)	-0.002 (0.002)
Ln(SALES)	0.018*** (0.003)	0.231*** (0.011)	0.698*** (0.051)	0.374*** (0.008)
%_LARGEST_SH	0.052*** (0.010)	0.459*** (0.077)	0.563*** (0.207)	-0.007 (0.044)
DIV_PR	-0.000 (0.001)	-0.004 (0.008)	-0.007 (0.027)	-0.004 (0.007)
%_STATE_OWN	-0.005 (0.004)	0.077** (0.033)	-0.315** (0.134)	-0.101*** (0.018)
%_IND_DIR	-0.007 (0.008)	-0.020 (0.047)	-0.131 (0.205)	-0.042 (0.033)
%_NONTRD_SH	-0.005 (0.009)	-0.142*** (0.040)	-0.064 (0.229)	0.021 (0.031)
Leverage	-0.159*** (0.007)	0.153*** (0.053)	0.107 (0.203)	-0.275*** (0.034)
PPE/TA	-0.049*** (0.009)	-0.087* (0.051)	-1.178*** (0.237)	-0.185*** (0.040)
Constant	-0.042 (0.048)	-0.579* (0.339)	-4.781*** (0.934)	-2.244*** (0.203)
Firm & Year FE	Y	Y	Y	Y
Observations	16,916	17,136	16,964	16,827

Table 7: Average Wages

VARIABLES	Ln(AWAGE)	Ln(AWAGE_NonExe)	Ln(AEXEPAY)
	(1)	(2)	(3)
SE0	0.065* (0.037)	0.089** (0.044)	0.025 (0.032)
P3_PR	0.015*** (0.006)	0.011** (0.005)	0.014*** (0.005)
P3_PR_D	0.031 (0.025)	0.028 (0.020)	-0.078*** (0.022)
Ln(NYEAR_LISTED)	-0.009 (0.013)	-0.016 (0.021)	-0.075*** (0.017)
Ln(MIN_WAGE)	0.296*** (0.047)	0.295*** (0.051)	0.176*** (0.050)
LAWSCORE	-0.007* (0.004)	-0.006 (0.006)	-0.030*** (0.005)
Labor_Law_Effect	0.003 (0.003)	0.001 (0.004)	0.014*** (0.003)
Ln(SALES)	0.120*** (0.011)	0.124*** (0.010)	0.196*** (0.008)
%_LARGEST_SH	0.220*** (0.055)	0.257*** (0.064)	0.011 (0.051)
DIV_PR	0.001 (0.012)	0.001 (0.011)	0.005 (0.006)
%_STATE_OWN	0.079*** (0.024)	0.069*** (0.020)	-0.019 (0.027)
%_IND_DIR	-0.017 (0.045)	-0.022 (0.046)	-0.028 (0.042)
%_NONTRD_SH	-0.058 (0.044)	-0.034 (0.047)	-0.030 (0.034)
Leverage	-0.111*** (0.037)	-0.119*** (0.043)	-0.176*** (0.035)
PPE/TA	-0.128*** (0.042)	-0.085 (0.060)	-0.193*** (0.040)
Constant	-1.836*** (0.288)	-1.781*** (0.317)	-0.116 (0.310)
Firm & Year FE	Y	Y	Y
Observations	16,960	16,026	16,026

Table 8: Total Wages

VARIABLES	Ln(Payroll)	Ln(Payroll_NonExe)	Ln(Payroll_Exe)
	(1)	(2)	(3)
S&O	-0.035 (0.035)	-0.033 (0.034)	0.011 (0.033)
P3_PR	0.027*** (0.004)	0.022*** (0.005)	0.020*** (0.006)
P3_PR_D	0.017 (0.019)	0.021 (0.018)	-0.134*** (0.025)
Ln(NYEAR_LISTED)	0.107*** (0.015)	0.109*** (0.015)	-0.060*** (0.021)
Ln(MIN_WAGE)	0.021 (0.047)	0.001 (0.042)	0.116** (0.051)
LAWSCORE	-0.020*** (0.003)	-0.021*** (0.004)	-0.022*** (0.004)
Labor_Law_Effect	-0.001 (0.003)	0.000 (0.003)	0.015*** (0.004)
Ln(SALES)	0.538*** (0.011)	0.545*** (0.011)	0.226*** (0.011)
%_LARGEST_SH	0.165** (0.064)	0.191*** (0.064)	0.011 (0.077)
DIV_PR	0.006 (0.004)	0.006* (0.003)	0.006 (0.007)
%_STATE_OWN	0.192*** (0.022)	0.197*** (0.023)	-0.014 (0.025)
%_IND_DIR	0.012 (0.034)	-0.002 (0.036)	0.072 (0.048)
%_NONTRD_SH	-0.024 (0.042)	-0.011 (0.034)	-0.117*** (0.043)
Leverage	0.164*** (0.035)	0.190*** (0.041)	-0.085* (0.047)
PPE/TA	0.413*** (0.043)	0.444*** (0.054)	-0.152*** (0.036)
Constant	-0.323 (0.287)	-0.236 (0.271)	-2.285*** (0.313)
Firm & Year FE	Y	Y	Y
Observations	17,131	16,152	16,152

Appendix 4:
First-Stage
Regression
Results

VARIABLES	SEO				
	(1)	(2)	(3)	(4)	(5)
SEOIneligible	-1.434***	-1.616***	-1.067***	-1.352***	-1.370***
	(0.371)	(0.404)	(0.350)	(0.471)	(0.364)
P3_PR	0.120	0.126	0.093	0.108	0.091
	(0.089)	(0.089)	(0.089)	(0.089)	(0.088)
P3_PR_D	-1.003***	-0.999***	-0.993***	-0.976***	-0.911***
	(0.362)	(0.363)	(0.358)	(0.359)	(0.340)
Ln(NYEAR_LISTED)	4.430***	4.438***	4.448***	4.508***	4.251***
	(0.462)	(0.462)	(0.463)	(0.461)	(0.455)
Ln(SALES)	1.033***	1.041***	1.018***	1.010***	1.022***
	(0.170)	(0.170)	(0.169)	(0.166)	(0.163)
Leverage	-5.225***	-5.275***	-5.142***	-5.026***	-5.000***
	(0.810)	(0.809)	(0.810)	(0.794)	(0.788)
PPE/TA	1.287	1.309	1.293	1.281	1.370
	(0.941)	(0.944)	(0.935)	(0.918)	(0.918)
%_IND_DIR	-0.792	-0.821	-0.828	-0.786	-0.825
	(0.636)	(0.635)	(0.634)	(0.640)	(0.639)
%_STATE_OWN	0.254	0.256	0.218	0.167	0.196
	(0.523)	(0.522)	(0.520)	(0.519)	(0.514)
%_LARGEST_SH	-2.308**	-2.303**	-2.325**	-2.342**	-1.926*
	(1.137)	(1.146)	(1.131)	(1.120)	(1.095)
%_NONTRD_SH	-1.552***	-1.561***	-1.522**	-1.551***	-1.353**
	(0.601)	(0.601)	(0.601)	(0.601)	(0.589)
DIV_PR	0.108	0.107	0.100	0.100	0.107
	(0.075)	(0.073)	(0.074)	(0.075)	(0.074)
Ln(MIN_WAGE)	1.690**	1.734**	1.605**	1.604**	1.574**
	(0.677)	(0.676)	(0.673)	(0.670)	(0.683)
LAWSCORE	0.064	0.064	0.069	0.069	0.062
	(0.068)	(0.068)	(0.068)	(0.068)	(0.069)
Labor_Law_Effect	0.115	0.119	0.102	0.107	0.111
	(0.084)	(0.085)	(0.082)	(0.082)	(0.081)
Firm & Year FE	Y	Y	Y	Y	Y
Observations	5,251	5,251	5,251	5,251	5,251
Pseudo R ²	0.4153	0.4167	0.4127	0.4126	0.397
Wald	635.3	633.3	643.7	646.4	602.3