

Table 1 Correlation matrix

| | Variables | Mean | Std. | Min | Max | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|--|---------|----------|------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 1 | average annual employee pay (thousand JPY) | 5,204.1 | 4,784.2 | 0.0 | 111,913.0 | 1.000 | | | | | | | | | |
| 2 | profitability | 26.4 | 18.6 | -97.0 | 100.0 | 0.223 | 1.000 | | | | | | | | |
| 3 | employee productivity | 1,207.6 | 1,959.3 | -206,293.9 | 166,500.0 | 0.601 | 0.194 | 1.000 | | | | | | | |
| 4 | employee share | 0.5 | 5.8 | -3,037.4 | 521.7 | 0.003 | -0.001 | -0.008 | 1.000 | | | | | | |
| 5 | total asset | 1,675.0 | 26,033.8 | 1.0 | 4,934,010.0 | 0.006 | 0.000 | 0.034 | -0.001 | 1.000 | | | | | |
| 6 | asset turnover | 1.8 | 1.4 | 0.0 | 194.0 | 0.076 | -0.099 | 0.016 | 0.001 | -0.026 | 1.000 | | | | |
| 7 | financial leverage | 4.9 | 30.3 | -2,733.0 | 3,066.0 | 0.003 | -0.007 | 0.011 | 0.000 | 0.000 | -0.016 | 1.000 | | | |
| 8 | growth in number of employees | 0.1 | 1.5 | -1.0 | 846.4 | -0.020 | 0.004 | -0.009 | 0.000 | 0.000 | 0.008 | 0.001 | 1.000 | | |
| 9 | growth in sales | 0.1 | 2.9 | -1.0 | 926.0 | 0.001 | -0.004 | 0.011 | -0.001 | -0.001 | 0.029 | 0.002 | 0.015 | 1.000 | |
| 10 | GDP deflator | 0.6 | 0.9 | -0.9 | 2.1 | -0.014 | 0.002 | -0.009 | -0.001 | -0.006 | 0.064 | -0.001 | 0.004 | 0.005 | 1.000 |
| 11 | average age of directors/managers | 61.6 | 10.0 | 30.0 | 100.0 | -0.035 | -0.049 | -0.040 | 0.002 | 0.007 | -0.065 | -0.021 | -0.015 | -0.012 | 0.004 |

N = 372,743 (firm-year)

Table 2 Variance component of average annual employee pay

| Random-effects Parameters | variance-explained (%) | estimates | standard error | 95% conf. interval | |
|---------------------------|------------------------|-----------|----------------|--------------------|--------|
| Year | 2.7% | 244.0 | 57.6 | 153.6 | 387.5 |
| Region (prefecture/city) | 7.9% | 725.4 | 78.9 | 586.1 | 897.8 |
| Industry | 21.2% | 1939.7 | 184.4 | 1609.9 | 2337.1 |
| Firm | 41.2% | 3774.7 | 12.1 | 3751.1 | 3798.5 |
| Error | 27.0% | 2467.4 | 2.8 | 2461.9 | 2472.9 |
| Total | 100.0% | | | | |

N = 442,822 (firm-year)

Table 3 Average annual employee pay by industry and region**(A). Average annual employee pay by industry (thousand JPY), 2013-2022**

| Industry | Mean | N | Industry | Mean | N |
|---|--------|--------|--|-------|---------|
| Activities auxiliary to financial services and insurance activities | 16,413 | 49 | Repair of computers and personal and household goods | 4,686 | 91 |
| Financial service activities, except insurance and pension funding | 10,163 | 494 | Civil engineering | 4,683 | 33,451 |
| Food and beverage service activities | 10,121 | 2,322 | Manufacture of chemicals and chemical products | 4,666 | 2,170 |
| Real estate activities | 9,441 | 11,462 | Manufacture of coke and refined petroleum products | 4,648 | 313 |
| Activities of head offices; management consultancy activities | 9,142 | 1,132 | Specialized construction activities | 4,615 | 116,664 |
| Postal and courier activities | 8,466 | 128 | Waste collection, treatment and disposal activities; materials recovery | 4,603 | 4,637 |
| Wholesale of mining, construction and civil engineering machinery | 7,450 | 78,733 | Other manufacturing | 4,501 | 2,582 |
| Other retail sale of new goods in specialized stores | 7,408 | 12,944 | Manufacture of beverages | 4,206 | 555 |
| Employment activities | 7,287 | 1,368 | Manufacture of food products | 4,108 | 6,407 |
| Electricity, gas, steam and air conditioning supply | 7,097 | 342 | Crop and animal production, hunting and related service activities | 3,939 | 1,305 |
| Advertising and market research | 6,970 | 942 | Forestry and logging | 3,917 | 192 |
| Creative, arts and entertainment activities | 6,917 | 794 | Other mining and quarrying | 3,839 | 580 |
| Sports activities and amusement and recreation activities | 6,738 | 1,613 | Manufacture of computer, electronic and optical products | 3,793 | 3,285 |
| Rental and leasing activities | 6,624 | 3,714 | Repair and installation of machinery and equipment | 3,736 | 3,594 |
| Water transport | 6,621 | 259 | Manufacture of textiles | 3,652 | 1,444 |
| Other personal service activities | 6,367 | 1,133 | Manufacture of other non-metallic mineral products | 3,625 | 3,106 |
| Accommodation | 6,350 | 655 | Manufacture of electrical equipment | 3,597 | 3,816 |
| Human health activities | 6,252 | 431 | Manufacture of machinery and equipment n.e.c. | 3,584 | 10,117 |
| Office administrative, office support and other business support activities | 6,231 | 4,461 | Fishing and aquaculture | 3,462 | 90 |
| Wholesale and retail trade and repair of motor vehicles and motorcycles | 5,936 | 4,008 | Veterinary activities | 3,456 | 19 |
| Other professional, scientific and technical activities | 5,902 | 650 | Manufacture of basic metals | 3,441 | 2,515 |
| Travel agency, tour operator reservation service and related activities | 5,879 | 90 | Manufacture of wearing apparel | 3,394 | 733 |
| Education | 5,872 | 450 | Remediation activities and other waste management services | 3,342 | 18 |
| Manufacture of wood and products of wood and cork | 5,801 | 17,676 | Construction of buildings | 3,328 | 17,517 |
| Motion picture, video and television program production, sound recording | 5,685 | 431 | Residential care activities | 3,317 | 5 |
| Warehousing and support activities for transportation | 5,554 | 1,476 | Printing and reproduction of recorded media | 3,240 | 2,848 |
| Activities of membership organizations | 5,524 | 252 | Manufacture of paper and paper products | 3,235 | 1,954 |
| Information service activities | 5,453 | 550 | Manufacture of leather and related products | 3,222 | 174 |
| Programming and broadcasting activities | 5,413 | 71 | Manufacture of basic pharmaceutical products and pharmaceutical preparations | 3,178 | 272 |
| Services to buildings and landscape activities | 5,300 | 2,487 | Manufacture of rubber and plastic products | 3,168 | 5,522 |
| Telecommunications | 5,131 | 368 | Architectural and engineering activities; technical testing and analysis | 3,160 | 37,631 |
| Libraries, archives, museums and other cultural activities | 5,093 | 4 | Manufacture of furniture | 3,124 | 1,658 |
| Publishing activities | 4,900 | 8,159 | Manufacture of fabricated metal products, except machinery and equipment | 2,863 | 12,519 |
| Security and investigation activities | 4,832 | 259 | Manufacture of other transport equipment | 2,783 | 289 |
| Air transport | 4,825 | 17 | Manufacture of motor vehicles, trailers and semi-trailers | 2,476 | 1,354 |
| Social work activities without accommodation | 4,823 | 672 | Land transport and transport via pipelines | 2,376 | 8,229 |
| | | | Total | 5,132 | 448,118 |

Notes: N: the number of firm-year cases in our data.

Table 3 Average annual employee pay by industry and region (cont.)

(B). Average annual employee pay by region (thousand JPY), 2013-2022

| Region | Mean | N | Region | Mean | N |
|---------------|-------------|----------|---------------|-------------|----------|
| Tokyo | 6,722 | 55,509 | Miyazaki | 4,374 | 2,889 |
| Osaka | 5,989 | 48,230 | Kagawa | 4,337 | 3,510 |
| Kyoto | 5,731 | 9,581 | Tokushima | 4,306 | 1,797 |
| Kanagawa | 5,678 | 22,895 | Nagano | 4,209 | 8,892 |
| Nara | 5,658 | 2,403 | Fukushima | 4,183 | 7,630 |
| Chiba | 5,621 | 16,628 | Fukui | 4,162 | 2,956 |
| Aichi | 5,513 | 39,582 | Okayama | 3,938 | 9,282 |
| Miyagi | 5,345 | 9,682 | Ehime | 3,927 | 3,129 |
| Hyogo | 5,306 | 18,010 | Akita | 3,906 | 1,885 |
| Shiga | 5,267 | 3,489 | Saga | 3,898 | 2,432 |
| Saitama | 5,253 | 15,767 | Yamaguchi | 3,866 | 5,224 |
| Gifu | 4,910 | 5,672 | Kochi | 3,783 | 3,373 |
| Mie | 4,899 | 4,897 | Kagoshima | 3,767 | 4,400 |
| Fukuoka | 4,755 | 17,245 | Aomori | 3,692 | 3,438 |
| Hokkaido | 4,707 | 17,241 | Toyama | 3,667 | 3,929 |
| Hiroshima | 4,702 | 19,736 | Tottori | 3,632 | 1,517 |
| Ibaraki | 4,659 | 6,508 | Nagasaki | 3,617 | 4,059 |
| Kumamoto | 4,628 | 3,706 | Shimane | 3,573 | 3,056 |
| Tochigi | 4,581 | 5,136 | Niigata | 3,518 | 10,298 |
| Gunma | 4,555 | 5,522 | Oita | 3,502 | 5,052 |
| Ishikawa | 4,537 | 4,144 | Okinawa | 3,461 | 5,450 |
| Yamanashi | 4,520 | 2,455 | Iwate | 3,386 | 2,834 |
| Wakayama | 4,489 | 1,957 | Yamagata | 3,247 | 3,336 |
| Shizuoka | 4,485 | 11,755 | Total | 5,132 | 448,118 |

Note: *N* indicates the number of firm-year cases in our data

Table 4 System GMM (twostep) estimates

(1) Model 1 Main effect

| DV: average annual employee pay (In) | B | S.E. | P | [95% CI] | |
|--|----------|----------|-------|----------|-------|
| <u>Lagged DV</u> | | | | | |
| Lagged average annual employee pay (In) | 0.606 | 0.020 | 0.000 | 0.566 | 0.645 |
| <u>Independent variables</u> | | | | | |
| profit creation (H1 +) | 0.123 | 0.010 | 0.000 | 0.103 | 0.142 |
| employee productivity (H2 +) | 0.190 | 0.035 | 0.000 | 0.121 | 0.259 |
| employee share /k (H3 +) | -0.040 | 2.018 | 0.984 | -3.995 | 3.916 |
| employee productivity x employee share | | | | | |
| profit creation x employee share | | | | | |
| <u>Control variables</u> | | | | | |
| total asset | 0.028 | 0.033 | 0.391 | -0.037 | 0.093 |
| asset turnover | 0.017 | 0.005 | 0.001 | 0.007 | 0.026 |
| financial leverage /k | -0.286 | 0.769 | 0.710 | -1.793 | 1.221 |
| growth in number of employees | -0.168 | 0.137 | 0.220 | -0.436 | 0.100 |
| growth in sales | 0.050 | 0.018 | 0.005 | 0.015 | 0.085 |
| GDP deflator | 0.002 | 0.001 | 0.000 | 0.001 | 0.003 |
| Average age of managers/directors | 0.003 | 0.131 | 0.838 | -0.230 | 0.283 |
| constant | 3.263 | 0.165 | 0.000 | 2.941 | 3.586 |
| Wald Chi-square | 10,683.8 | | | | |
| N (firm-year) | 366,210 | | | | |
| N of firms | 53,297 | | | | |
| N of instruments | 54 | | | | |
| Arellano–Bond test (H0: No autocorrelation) | | | | | |
| <u>Order</u> | <u>Z</u> | <u>P</u> | | | |
| AR(1) | -3.607 | 0.000 | | | |
| AR(2) | 1.314 | 0.189 | | | |

Notes: (1) B: standardized coefficients; S.E.: WC-robust standard error; P: p-value95; CI: 95% confidence interval; (2) “/k” refers to the value divided by 1000; (3) AR(1) represents the first-order serial correlation in first differences, and AR(2) the second-order serial correlation in first differences.

Table 4 System GMM (twostep) estimates (cont.)

(2) Model 2-1 Main effect + interaction effect (employee productivity x employee share)

| DV: average annual employee pay (ln) | B | S.E. | P | [95% CI] | |
|---|----------|----------|-------|----------|--------|
| <u>Lagged DV</u> | | | | | |
| Lagged average annual employee pay (ln) | 0.377 | 0.020 | 0.000 | 0.338 | 0.416 |
| <u>Independent variables</u> | | | | | |
| profit creation (H1 +) | 0.113 | 0.005 | 0.000 | 0.102 | 0.123 |
| employee productivity (H2 +) | 0.943 | 0.050 | 0.000 | 0.845 | 1.040 |
| employee share (H3 +) | 6.518 | 0.312 | 0.000 | 5.907 | 7.129 |
| employee productivity x employee share | 10.958 | 0.524 | 0.000 | 9.931 | 11.986 |
| profit creation x employee share | | | | | |
| <u>Control variables</u> | | | | | |
| total asset | 0.001 | 0.003 | 0.837 | -0.005 | 0.006 |
| asset turnover | 0.014 | 0.002 | 0.000 | 0.010 | 0.019 |
| financial leverage /k | 0.508 | 0.477 | 0.287 | -0.428 | 1.444 |
| growth in number of employees | -0.069 | 0.063 | 0.274 | -0.194 | 0.055 |
| growth in sales | 0.032 | 0.012 | 0.007 | 0.009 | 0.054 |
| GDP deflator | 0.002 | 0.000 | 0.000 | 0.002 | 0.003 |
| Average age of managers/directors | 0.137 | 0.093 | 0.143 | -0.046 | 0.320 |
| constant | 5.236 | 0.167 | 0.000 | 4.908 | 5.564 |
| Wald Chi-square | 13,432.1 | | | | |
| N (firm-year) | 366,210 | | | | |
| N of firms | 53,297 | | | | |
| N of instruments | 55 | | | | |
| <u>Arellano–Bond test</u> (H0: No autocorrelation) | | | | | |
| <u>Order</u> | <u>Z</u> | <u>P</u> | | | |
| AR(1) | -8.364 | 0.000 | | | |
| AR(2) | -1.065 | 0.287 | | | |

Notes: (1) B: standardized coefficients; S.E.: WC-robust standard error; P: p-value; CI: 95% confidence interval; (2) “/k” refers to the value divided by 1000; (3) AR(1) represents the first-order serial correlation in first differences, and AR(2) the second-order serial correlation in first differences.

Table 4 System GMM (twostep) estimates (cont.)

(3) Model 2-2 Main effect + interaction effect (profit creation x employee share)

| DV: average annual employee pay (ln) | B | S.E. | P | [95% CI] | |
|---|----------|----------|-------|----------|-------|
| <u>Lagged DV</u> | | | | | |
| Lagged average annual employee pay (ln) | 0.596 | 0.030 | 0.000 | 0.537 | 0.655 |
| <u>Independent variables</u> | | | | | |
| profit creation (H1 +) | 0.132 | 0.012 | 0.000 | 0.109 | 0.156 |
| employee productivity (H2 +) | 0.193 | 0.049 | 0.000 | 0.098 | 0.289 |
| employee share (H3 +) | -0.049 | 0.512 | 0.924 | -1.052 | 0.954 |
| employee productivity x employee share | | | | | |
| profit creation x employee share | -0.036 | 0.366 | 0.922 | -0.753 | 0.682 |
| <u>Control variables</u> | | | | | |
| total asset | 0.030 | 0.035 | 0.394 | -0.039 | 0.098 |
| asset turnover | 0.012 | 0.006 | 0.045 | 0.000 | 0.024 |
| financial leverage /k | -0.245 | 0.735 | 0.739 | -1.685 | 1.195 |
| growth in number of employees | -0.155 | 0.132 | 0.242 | -0.414 | 0.105 |
| growth in sales | 0.042 | 0.030 | 0.166 | -0.017 | 0.101 |
| GDP deflator | 0.002 | 0.000 | 0.000 | 0.001 | 0.003 |
| Average age of managers/directors | 0.009 | 0.136 | 0.948 | -0.258 | 0.276 |
| constant | 3.345 | 0.248 | 0.000 | 2.859 | 3.831 |
| Wald Chi-square | | | | | |
| | 10,947.8 | | | | |
| N (firm-year) | | | | | |
| | 366,210 | | | | |
| N of firms | | | | | |
| | 53,297 | | | | |
| N of instruments | | | | | |
| | 55 | | | | |
| Arellano–Bond test | | | | | |
| (H0: No autocorrelation) | | | | | |
| <u>Order</u> | <u>Z</u> | <u>P</u> | | | |
| AR(1) | -3.988 | 0.000 | | | |
| AR(2) | 1.488 | 0.137 | | | |

Notes: (1) B: standardized coefficients; S.E.: WC-robust standard error; P: p-value; CI: 95% confidence interval; (2) “/k” refers to the value divided by 1000; (3) AR(1) represents the first-order serial correlation in first differences, and AR(2) the second-order serial correlation in first differences.