

Contractors' Asymmetric Bargaining Power and the Impact on Subcontractors' Wages

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This study investigates the wage differentials caused by the differences in bargaining power that reflect the hierarchical structure between buyers and suppliers of intermediate goods. It uses novel data that includes firm-level information on whether or not a firm is a subcontractor and whether prime contractors have requested unit-price reductions from subcontractors, and, if so, how these subcontractors respond to these contractors' unfair requests. The main findings are that subcontractors' wages are much lower than those of prime contractors, even when controlling for firm size and other characteristics. This is closely related to contractors with asymmetric bargaining power unfairly transferring costs to subcontractors. We also find that the negative impact of unfair unit-price reductions on subcontractors' wages tends to be more pronounced when their sales in proportion to those of top-tier contractors are relatively large.

핵심주제어: bargaining power; wage differentials; subcontractors; unfair unit-cost reduction

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I. Introduction

According to The Survey on Labor Conditions by Employment Type, conducted by the Korean Ministry of Employment and Labor, in 2019, the average per capita wage of small- and medium-sized South Korean enterprises was 57 percent of that country's large-sized firms.¹⁾ Figure A.1 in the appendix shows the wage differentials across firm sizes. Given the average monthly wage per regular worker at large-sized firms with 300 or more employees is set to 100, the wages for firms with fewer than five, thirty and three hundred employees respectively amount to 42, 58 and 67 percent. This positive firm-size wage premium has been observed in most countries, especially in advanced nations. In comparison to other major countries, such as the USA, Japan and France, however, the wage gap between large-sized corporations and small- and medium-sized enterprises (SMEs) is much higher in South Korea.²⁾ The positive relationship between the size and wage of firms has been widely studied and considered a stylized fact in the literature (Akerlof and Yellen, 1990; Schmidt and Zimmermann, 1991; Kremer and Maskin, 1996; Bayard and Troske, 1999; Idson and Oi, 1999; Troske, 1999; OECD, 2017; Berlingieri et al., 2018). These studies share the view that the existence of firm-size wage premiums are mainly associated with (labor) productivity differentials, rent sharing, and/or efficiency wages.

Our study aims to shed light on the wage differentials that are

1) Note that small- and medium-sized enterprises (SMEs) refer to firms with fewer than 300 employees.

2) According to Noh (2018), compared to large-sized firms with 500 or more employees, the average wage in Korea is 54.2 percent, which is relatively lower than that of the US (88.7 percent), Japan (88.1 percent) and France (72.8 percent). To be more specific, the wage of Korean firms with 5 to 9 employees is 48.3 percent of that of large firms, while those for the US, Japan, and France are 64.8, 77.1, and 63.4 percent, respectively.

caused by differences in bargaining power that reflect unfair trading practices between contractors and subcontractors.³⁾ By doing so, we emphasize the bargaining power that plays a certain role in explaining the size-wage premium, at least within SMEs, that is not captured by labor productivity. Wage gap between contractors and subcontractors due to the differences in bargaining power can intensify the size-wage premium beyond what the actual (labor) productivity differential accounts for. The size-wage premium may be strengthened by the wage differentials that exist between contractors and subcontractors because subcontractors are relatively small compared to contractors.

The deepening of global supply chains as a result of increasing globalization tends to expand the monopsony power of downstream firms in domestic markets that supply intermediate goods. Accordingly, it is highly likely that a prime contractor with an asymmetrical position will transfer part of their production costs to subcontracting firms.⁴⁾ The transfer of these costs as they relate to differences in bargaining power between prime contractors and subcontractors leads to downward pressure on the wages of subcontractors' workers and this results in pay that is lower than these workers' actual labor productivity.

Despite enforcement of the Monopoly Regulation and Fair Trade Act, unfair trade practices persist between contractors and subcontractors in South Korea.⁵⁾ According to Ahn (2015), as of 2013, the average

3) Throughout the paper, the differences in bargaining power refer to the bargaining advantage of contractors (that is, the purchaser of intermediate goods) against subcontractors as intermediate goods suppliers. Since we use firm-level data of SMEs, it should be careful in interpreting the relationship between the size of firms and the wage gap mentioned in this study as the wage gap between large-sized firms and SMEs.

4) Note that, in our paper, "contractors" and "prime contractors" are used as synonyms.

5) In fact, economic experts pointed out that addressing unfair unit-cost-reduction

wage of subcontractors was about 51 percent that of prime contractors, which is significantly low. To be more specific, the average wages of first-, second-, third-tier vendors were about 52, 50, and 42 percent, respectively, of those of prime contractors. This shows that the wage gap worsens along upstreamness. Unfair trade between prime contractors and subcontractors leads to unreasonably low wages for subcontractors' employees and this may result in long-term declines in the competitiveness of small-sized subcontractors.⁶⁾

Few studies show empirical evidence for a wage gap between prime contractors and subcontractors. For example, Ahn (2015) incorporated The Survey on Labor Conditions by Employment Type into Korea Enterprise Data (KED) that provides transaction information between contractors and subcontractors to confirm the wage gaps among contractual parties. Similarly, a recent paper by Song (2018) employed a human capital corporate panel (HCCP) to show wage differentials between contractors and subcontractors. However, these studies do not clarify whether wage differentials are the result of unfair trade. To the best of our knowledge, this is the first study suggesting that unfair trade in the transfer of costs can cause a wage gap between prime contractors and subcontractors.

This paper aims to provide solid empirical evidence for a relationship between the relatively low wages of subcontractors and contractors' asymmetric bargaining power due to the hierarchical structure of supply chains. To do so, we employ survey data that includes important information about unfair unit-price reduction requests from contractors and look into the extent to which these

request from contractors is a core task of the next chairperson of the Fair Trade Commission (the position was vacant in 2019) which tells us that unfair trade between contracting parties is a serious concern in Korea.

6) The undervalued wages of subcontractors' workers lead to a decrease in their desire to work for these firms and negative effects on the labor market, which may adversely affect the productivity of SMEs in the long-term.

unfair requests affect subcontractors' wages. In other words, we quantify how the unit-cost reduction requests affect subcontractor's wages.

The main results are summarized as follows. First, subcontractors' wages are, on average, from 6.7 to 6.9 percent lower than those of contractors. Second, subcontractors who inevitably accept contractors' requests for lowering their unit costs are associated with lower wages and this relation is statistically significant. Third, the negative impacts of unfair unit-price reductions on subcontractors' wages tend to be pronounced when their sales' proportions to top-tier contractors are relatively large.

This paper contributes to the literature on the size-wage premium and wage differentials between contractors and subcontractors. The issue of wage differentials caused by unfair trade practices is important for policy makers in that they can adversely affect a country's inclusive growth in the long run. Our study also contributes to the literature about the existence of an asymmetric bargaining power that is caused by the hierarchical structure of supply chains, which results in relatively low wages for subcontractors.

To the best of our knowledge, this is the first paper to provide empirical evidence about the existence of wage differentials that are caused by asymmetric bargaining power between contracting parties. It has important implications for understanding how differences in bargaining power lead to downward pressure on subcontractors' wages, at least for South Korea, where wage inequality between large-sized corporations and SMEs is a serious issue. In the following section, we discuss the empirical methodology, the data, and the estimation results. Section 3 concludes our paper.

II. The Empirical Analysis and Data

1. Empirical Methodology

Our study aims to identify whether wage differentials exist between contractors and subcontractors and, if so, to examine the extent to which they are associated with unfair trade; that is, contractors' unit-cost reduction requests as a result of asymmetric bargaining power. The estimation equation for our cross-sectional data analysis using a simple OLS model can be written as follows.⁷⁾

$$\ln(W)_{ij} = \alpha + \beta D_i + X'_i \gamma + \varphi_j + \varepsilon_{ij} \quad (1)$$

where the dependent variable is the logarithmic transformation of firm i 's wage in sector j ; the wage is the average annual starting salary for college graduates; and X_i represents firm-specific characteristics including the logarithm of sales per worker, capital stock per worker, the number of employees, and firm age. We use sales per worker as a proxy for labor productivity. The number of employees and capital stock per worker are used as proxies for firm size and capital intensity, respectively. We include industry fixed effects, φ_j . ε_{ij} represents idiosyncratic errors. In addition, we add region dummies in the analysis so as to control for region-specific variance.

D_i are variables of interest related to subcontractors and includes information on whether a firm is a subcontractor and whether

7) Since the impacts of unfair trade between contracting parties, such as unit-cost reduction, on the wages of subcontractors are not immediate and may occur with time lag, it is necessary to obtain time-series data. Nevertheless, a cross-sectional analysis may be partially justified in that the current experience of receiving unfair unit-price-reduction requests from contractors may have continued in the past.

prime contractors asked for unit-price reductions and, if so, how subcontractors responded to these contractors' unfair requests. For example, D_i can be a dummy variable that takes the value one if the firm is a subcontractor and zero otherwise. With this dummy, we capture the presence of a wage gap between contractors and subcontractors. If D_i is set to be a dummy that indicates whether contractors asked subcontractors to lower their unit prices, D_i possibly captures how the unit-cost-reduction request as unfair trade affects subcontractors' wages. When we restrict the sample to only subcontractors who have been asked to lower their unit prices, a dummy variable D_i takes the value of one if subcontractors had accepted these requests and zero otherwise. In this case of dummy variable, we focus on the role of a unit-price reductions in lowering subcontractors' wages.

2. Data

Our study uses survey data consisting of 1,000 Korean manufacturing SMEs with 10 or more employees which are included in Korea Enterprise Data (KED).⁸⁾ A survey sample was randomly constructed targeting SMEs with financial information in 2017 in KED data. KED provides information on firms' total sales, capital stock, number of employees, and year of established.⁹⁾ More importantly, KED includes additional information on sales networks, such as shares of total sales to major contractors (that is, purchasers

8) It should be noted that the survey sample well represents the population of Korean manufacturing firms. See Koo et al., (2019) in more detail about the representativeness of the survey sample. The Korea Institute for International Economic Policy (KIEP) conducted a survey in 2019 with the aims of providing implications for SME internationalization policies. See Koo et al., (2019) for further information about a survey.

9) KED financial information of all firms responding to the survey was available in both 2016 and 2017, while that in 2018 was not available for many SMEs.

of their intermediate products), so it enables us to calculate shares of sales to top-tier contractors. A relatively large proportion of sales to major contractors may reflect a high possibility of unfair trade from the perspective of differences in bargaining power. The study uses cross-sectional data collected in 2017.¹⁰⁾

In addition to KED, we use survey data that contains information on whether a firm is a subcontractor, whether contractors have requested unit-price reductions and, if so, how subcontractors responded.¹¹⁾ We use this information to examine the extent to which unfair costs that are transferred to subcontractors can account for these firms' relatively low wages. To be more specific, we compare the wages of subcontractors that accept the unit-cost-reduction requests with those that do not so as to capture the effect of the acceptance of these requests on subcontractors' wages.¹²⁾

Lastly, wages are obtained from a database provided by Saramin, a job-matching platform.¹³⁾ The wage data from Saramin is based on various sources, such as NICE investors service, the National Pension Service, Employment Insurance Service, Financial Supervisory Service, Credit Job, and Saramin's internal data collection.¹⁴⁾ In this

10) KED provides information on a firm's sales networks of a certain year which differ across firms, so it is not panel data. In this study, we use information on sales networks for the year of 2017.

11) Note that the subcontractors included in the sample are not related firms or affiliates that have been owned by a contractual party.

12) The information provided by survey data is available for the period 2016 to 2018. However, the main variable of interest related to a survey contains information for the past 3 years (2016-2018) on whether a firm has been a request for unit-price reductions from prime contractors and, if so, how they responded to these requests. Thus, there is a limitation in that it is not specify the exact year in which the unit-price-reduction request was received.

13) The survey was originally conducted for the purpose of examining the effect of export-related loans on firms' export performance; thus, it does not include wage information.

14) According to Saramin, the annual salaries are estimated by using an artificial-intelligence-based big data analysis, which improves the reliability and accuracy of salary data.

study, we use the average annual starting salary for college graduates. Most firms' wages are reported for 2017 and if no wage information is available for that year, we use data for 2018. Table 1 presents the summary statistics of the main variables. Subcontractors' average wages are between 91 and 93 percent of those of contractors and independent firms, respectively. It is noteworthy that average sales and capital stock per worker and the number of employees are smaller for subcontractors than for contractors.

The Figure A.2 shows the kernel density estimation for the annual wage (that is, the annual starting wage for college graduates) across types of firms (that is, contractors, subcontractors, and the other independent firms). As shown in Figure A.2, subcontractors' annual wages are relatively low compared to those of contractors and other independent firms.

〈Table 1〉 Descriptive statistics for contractors, subcontractors and all firms, 2017

		Obs.	Mean	P50	Min	Max	S.D.
Contractors (290)	ln(Wage)	196	8.05	8.06	7.91	8.41	0.09
	ln(Sales per worker)	280	12.29	12.33	7.03	14.43	0.88
	ln(CS per worker)	274	11.51	11.58	7.46	14.55	1.01
	ln(No. of employees)	280	3.21	3.14	2.30	5.99	0.93
	Firm age	281	15.92	15.00	1.0	61.00	8.41
Subcontractors (325)	ln(Wage)	246	7.98	7.96	7.60	8.23	0.09
	ln(Sales per worker)	324	12.15	12.19	8.09	14.47	0.85
	ln(CS per worker)	316	11.09	11.25	6.04	14.43	1.27
	ln(No. of employees)	324	3.13	3.04	2.30	5.70	0.80
	Firm age	322	15.19	15.50	0.00	45.00	8.80
	Sales proportion	324	63.15	64.18	0.48	100.00	28.94

		Obs.	Mean	P50	Min	Max	S.D.
Independent firms (385)	ln(Wage)	184	8.03	8.03	7.80	8.31	0.09
	ln(Sales per worker)	295	12.30	12.31	8.21	15.12	0.87
	ln(CS per worker)	281	11.36	11.49	7.89	14.83	1.02
	ln(No. of employees)	296	3.06	3.00	2.30	6.06	0.82
	Firm age	296	15.24	14.00	0.00	46.00	8.60
Ttotal (1,000)	ln(Wage)	626	8.02	8.00	7.60	8.41	0.09
	ln(Sales per worker)	899	12.24	12.25	7.03	15.12	0.87
	ln(CS per worker)	871	11.31	11.44	6.04	14.83	1.13
	ln(No. of employees)	900	3.13	3.00	2.30	6.06	0.85
	Firm age	899	15.43	15.00	0.00	61.00	8.61

Notes: The survey data consists of a total 1,000 firms out of which 290 firms are contractors, while 325 firms are subcontractors. The 385 remaining firms are other independent firms. *ln(CS per worker)* refers to the natural logarithm of capital stock per worker. Sales proportion refers to the proportion of sales to the top two contractors.

3. Estimation Results

Table 2 presents the basic results that are estimated using equation (1). Table 2 enables us to confirm whether there exist wage differentials according to firm size, capital stock per worker, and subcontractor. As expected, the wage is positively associated with firm size (that is, the number of employees) and is statistically significant at conventional levels. We also find the significant and positive role of the capital stock per worker in determining firms' wages. This result is closely related to the fact that the capital stock per worker is positively associated with labor productivity and, thus, the wage (Damiani et al., 2013). *Subcontractor-Dummy* is statistically negative at the one percent level of significance, which implies that subcontractors' wages are lower, on average, than those of other types of firms, including contractors. Based on the

estimated coefficients, subcontractors' wages are about 4.5 percent lower than the wages of other types of firms. It should be noted that these results are consistent regardless of whether industry and/or region dummies are included.

〈Table 2〉 Basic results including all types of firms

	Dependent variable: ln(Wages)				
	(1)	(2)	(3)	(4)	(5)
ln(Sales per worker)	0.017*** (0.006)	0.017*** (0.006)	0.017*** (0.006)	0.014** (0.006)	0.013** (0.006)
ln(Capital stock per worker)	0.022*** (0.004)	0.022*** (0.005)	0.018*** (0.004)	0.018*** (0.004)	0.019*** (0.004)
ln(Number of employees)	0.022*** (0.005)	0.022*** (0.005)	0.019*** (0.005)	0.019*** (0.005)	0.019*** (0.005)
Firm age		0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Contractor-Dummy			0.020** (0.009)	0.022** (0.009)	0.023** (0.010)
Subcontractor-Dummy			-0.045*** (0.008)	-0.046*** (0.009)	-0.042*** (0.009)
Observations	608	608	608	608	608
R-squared	0.166	0.166	0.250	0.298	0.317
Industry dummies	NO	NO	NO	YES	YES
Region dummies	NO	NO	NO	NO	YES

Notes: *Contractor-Dummy* is a dummy variable that takes the value one if the firm is a contractor and zero otherwise. *Subcontractor-Dummy* is a dummy variable that takes the value one if the firm is a subcontractor. The robust standard errors are in parentheses. *** and ** refer to statistical significance at the 1% and 5% levels, respectively

Table 3 reports the results estimated from the sample that includes only contractors and subcontractors. The estimated coefficients are similar to those of Table 2. The coefficients on *Subcontractor-Dummy*

are all negative at the one percent level of significance. Based on the estimated coefficients (that is 0.064 to 0.102), the subcontractors' wages are on average between 6.6 and 10.7 percent lower than those of contractors. The wage gap between contractors and subcontractors is relatively large even when controlling for firm size and other characteristics. Note that model (6) in Table 3 restricts the sample to only subcontractors who have been asked by contractors to lower their unit prices. The fact that the estimate in model (6) is much larger than in other models (1)-(5) that include all subcontractors in the sample infers that the wage differential between contractors and subcontractors is closely related to unfair trade. However, the estimated results in Table 3 do not imply that the wage gap between contractors and subcontractors is directly caused by unfair trade practices against subcontractors. Further analysis is needed to answer the question of whether this wage gap is closely related to the bargaining disadvantage subcontractors face.

〈Table 3〉 Basic results including only contractors and subcontractors

	Dependent variable: ln(Wages)					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Sales per worker)	0.015** (0.007)	0.015** (0.007)	0.016** (0.006)	0.012** (0.006)	0.011 (0.007)	0.022** (0.010)
ln(Capital stock per worker)	0.023*** (0.005)	0.023*** (0.005)	0.019*** (0.005)	0.021*** (0.005)	0.021*** (0.005)	0.020*** (0.007)
ln(Number of employees)	0.021*** (0.006)	0.021*** (0.006)	0.018*** (0.006)	0.017*** (0.006)	0.017*** (0.006)	0.025*** (0.008)
Firm age		0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.002** (0.001)
Subcontractor-Dummy			-0.065*** (0.008)	-0.066*** (0.009)	-0.064*** (0.010)	-0.102*** (0.019)

	Dependent variable: $\ln(\text{Wages})$					
	(1)	(2)	(3)	(4)	(5)	(6)
Observations	430	430	430	430	430	231
R-squared	0.176	0.176	0.284	0.328	0.342	0.388
Industry dummies	NO	NO	NO	YES	YES	YES
Region dummies	NO	NO	NO	NO	YES	YES

Notes: *Subcontractor-Dummy* is a dummy variable that takes the value one if the firm is a subcontractor and zero if it is a contractor. The robust standard errors are in parentheses. *** and ** refer to statistical significance at the 1% and 5% levels, respectively.

Now we look into the sample that consists of subcontractors only to investigate whether the subcontractors' relatively low wages are associated with unfair trading practices caused by differences in bargaining power. To do this, we employ information about the unit-cost-reduction requests that subcontractors face. Table 4 reports the main results from the estimation including the dummy variables of interest that are related to these unit-cost-reduction requests. The *UPR request dummy* in Table 4 takes the value one if subcontractors have been asked to reduce their unit prices and zero otherwise. As seen in column (2) of Table 4 the coefficient is negative but statistically insignificant. This result is to be expected because being asked for a unit-price reduction does not imply that a subcontractor has actually reduced their unit price.

To identify a linkage between the unfair trade subcontractors face and their wages, we use the *UPR response dummy* that takes the value one if the subcontractors have unwillingly accepted requests for lowering their unit prices. Note that the value of zero for the *UPR response dummy* includes subcontractors in cases where the unit-cost-reduction requests themselves do not exist.¹⁵⁾

15) Out of the total 246 subcontractors with wage information, 163 received no

Columns (3) and (4) in Table 4 confirm that employees of subcontractors who inevitably accept contractors' unfair requests are likely to be lower wage compared to other subcontractors. *SS to top two contractors* in columns (4) and (6) refers to the shares of sales to the top two contractors.¹⁶⁾ We make use of this information to examine whether the degree of dependency of major contractors affects either the coefficients of *UPR response dummy* or subcontractors' wages. As shown in Table 4, the effect of *UPR response dummy* on subcontractors' wages is not dependent on the inclusion of the shares of sales to the top two contractors and it directly does not affect subcontractors' wages.

The last two columns of Table 4 show the results of the regression that includes only subcontractors (that is, 80 SMEs with wage information) who have been asked to lower their unit prices. The estimates indicate that subcontractors that inevitably accept unit-cost-reduction requests are associated with relatively low wages and this relationship is statistically significant at the one percent level. Based on the estimates, which are shown in models (5) and (6) of Table 4, the wages of subcontractors accepting the unit-cost-reduction requests are about 5.5 percent lower than those of subcontractors who do not.

requests for unit-price reductions. Out of 83 subcontractors who were asked for unit-price reductions, 40 unwillingly accepted contractors' unfair request

16) It should be noted that the proportion of sales to top two contractors does not mean sales to them who have requested a unit-price reduction.

(Table 4) Main results using only subcontractors

	Dependent variable: ln(Wages)					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Sales per worker)	-0.003 (0.008)	-0.002 (0.008)	-0.001 (0.008)	-0.001 (0.008)	-0.017 (0.015)	-0.017 (0.015)
ln(Capital stock per worker)	0.027*** (0.007)	0.027*** (0.007)	0.026*** (0.007)	0.025*** (0.007)	0.049*** (0.015)	0.050*** (0.015)
ln(Number of employees)	0.012 (0.008)	0.011 (0.008)	0.010 (0.008)	0.009 (0.008)	0.005 (0.017)	0.006 (0.017)
Firm age	0.001* (0.001)	0.001* (0.001)	0.001 (0.001)	0.001 (0.001)	-0.003* (0.001)	-0.002* (0.001)
UPR request dummy		-0.014 (0.012)				
UPR response dummy			-0.036** (0.016)	-0.038** (0.017)	-0.053*** (0.018)	-0.054*** (0.018)
SS to top two contractors				-0.000* (0.000)		0.000 (0.000)
Observations	238	238	238	238	80	80
R-squared	0.338	0.342	0.357	0.367	0.644	0.647
Industry dummies	YES	YES	YES	YES	YES	YES
Region dummies	YES	YES	YES	YES	YES	YES

Notes: Abbreviations *UPR* and *SS* refer to unit-price reduction and share of sales, respectively. The *UPR request dummy* takes the value one if subcontractors have been asked to reduce their unit prices and zero otherwise. The *UPR response dummy* is a dummy variable that takes the value one if subcontractors have accepted all or part of the contractors' UPR requests and zero if subcontractors have not accepted the UPR request or if the request itself did not exist. (5) and (6) include only the cases where the UPR requests existed. The robust standard errors are in parentheses. ***, **, and * refer to statistical significance at the 1%, 5%, and 10% levels, respectively

We also make use of information on the degree of dependency of major contractors (that is, the shares of sales to top-tier contractors), so as to examine whether the relationship between subcontractors' low wages and unit-price-reduction requests is more pronounced depending on the degree of dependency of major contractors. Table 5 presents the results estimated adding interaction terms to a regression. As seen in columns (4) and (6) of Table 5, the interaction terms are negative and statistically significant at conventional levels. These results indicate that the negative relationship between subcontractors' unit-price reductions and their low wages tends to be pronounced when proportion of their sales to top-tier contractors is relatively large. For instance, the wages of subcontractors whose shares of sales to the top two contractors are above 75th quantile are about 11.9 percent lower than those of subcontractors who do not depend as much on the top two contractors. It is worth noting, *ceteris paribus*, that subcontractors with a high proportion of sales to top-tier contractors are positively associated with relatively high wages. This result is plausible in that the higher the proportion of sales to top-tier contractors the more stable the supply of intermediate goods.

〈Table 5〉 Main results with the interaction terms

	Dependent variable: ln(Wages)					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Sales per worker)	-0.017 (0.015)	-0.017 (0.015)	-0.017 (0.015)	-0.014 (0.016)	-0.017 (0.016)	-0.014 (0.015)
ln(Capital stock per worker)	0.050*** (0.015)	0.051*** (0.015)	0.049*** (0.015)	0.049*** (0.015)	0.049*** (0.016)	0.054*** (0.015)
ln(Number of employees)	0.006 (0.017)	0.007 (0.017)	0.005 (0.017)	0.009 (0.016)	0.004 (0.019)	0.018 (0.018)

	Dependent variable: $\ln(\text{Wages})$					
	(1)	(2)	(3)	(4)	(5)	(6)
Firm age	-0.002 [*] (0.001)	-0.003 [*] (0.001)	-0.002 [*] (0.001)	-0.002 [*] (0.001)	-0.003 [*] (0.001)	-0.003 [*] (0.001)
SS to top two contractors	0.000 (0.000)	0.001 (0.000)				
SS dummy above 75 percentage			0.004 (0.024)	0.041 [*] (0.024)		
SS dummy above 75th quantile					-0.010 (0.030)	0.054 [*] (0.029)
UPR response dummy	-0.054 ^{***} (0.018)	-0.018 (0.039)	-0.054 ^{***} (0.018)	-0.030 (0.025)	-0.053 ^{***} (0.019)	-0.020 (0.026)
× SS to top two contractors		-0.001 (0.001)				
× SS dummy above 75 percentage				-0.074 [*] (0.042)		
× SS dummy above 75th quantile						-0.112 ^{**} (0.044)
Observations	80	80	80	80	80	80
R-squared	0.647	0.653	0.644	0.664	0.645	0.678
Industry dummies	YES	YES	YES	YES	YES	YES
Region dummies	YES	YES	YES	YES	YES	YES

Notes: *SS to top two contractors* refers to the shares of sales to top two contractors. The *SS dummy above 75 percentage* takes the value one if the proportion of sales to the top two contractors is above 75 percent. The *SS dummy above 75th quantile* is a dummy variable that takes the value of one if the subcontractors' shares of sales to the top two contractors are in the 75th percentile. The symbol × in front of variables refers to the interaction terms between the *UPR response dummy* and the variables. The robust standard errors are in parentheses. ***, **, and * refer to statistical significance at the 1%, 5%, and 10% levels, respectively

III. Concluding Remarks

In this paper, we use a novel dataset that provides firm-level information on whether a firm is a subcontractor, whether there have been a requests for unit-price reductions from prime contractors and, if so, how they responded to these requests. This information allows us to shed light on the wage differentials caused by the differences in bargaining power that reflect the hierarchical structure between buyers and suppliers.

The main results of this paper can be summarized as follows. First, subcontractors' wages are much lower than those of contractors. Second, unfair trade as a result of differences in bargaining power plays a critical role in shaping subcontractors' wages. These cost transfers to subcontractors through bargaining constitute an unfair trade practice that leads to downward pressure on subcontractors' wages and results in labor being paid less than their actual productivity would imply. Third, the negative impact on subcontractors' wages tends to be more pronounced when their sales' proportions to top-tier contractors are relatively large.

To the best of our knowledge, this is the first paper to provide empirical evidence about the existence of wage differentials between contracting parties being caused by asymmetric bargaining power. This finding has important implications for understanding how differences in bargaining power due to asymmetrical structures along supply chains can lead to downward pressure on subcontractors' wages. This is particularly pertinent for South Korea where significant wage inequality exists between large-sized corporations and SMEs. Our study is also related to the literature on the size-wage premium in that it can be strengthened by wage differentials between contractors and subcontractors. Wage differentials due to unfair trade practices have important implications for public policy makers as these types

of inequalities can adversely affect a country's inclusive growth in the long run.

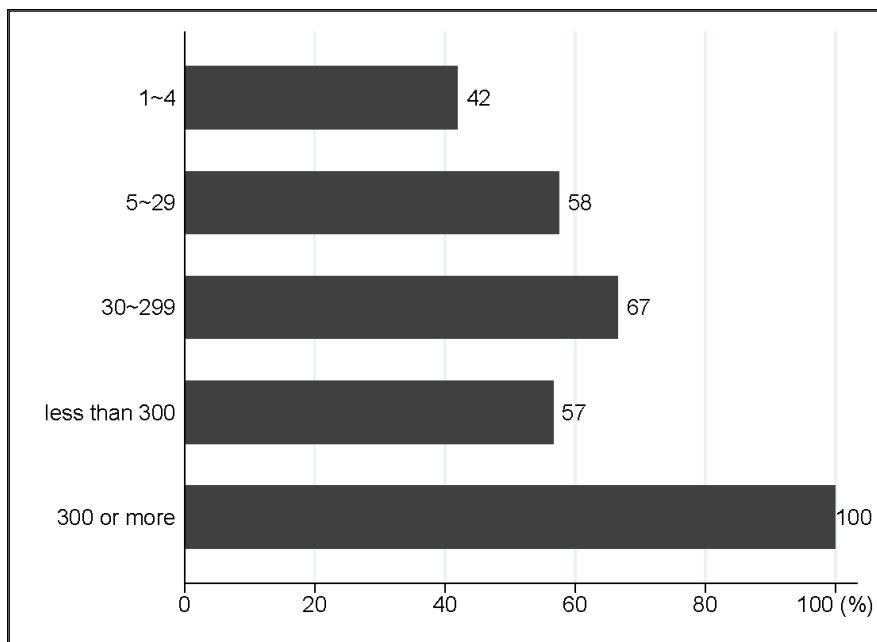
The data we used in this paper pose limitations in estimating actual labor productivity and in identifying the changes in wages caused by unfair trade practice. In this context, we need to further extend this research so as to identify the actual labor productivity of subcontractors and compare it with the wages that are undervalued due to prime contractors' bargaining advantage. Unit-price reduction as unfair trade may not be reflected solely in the wages of subcontractors. Subcontractors may respond to unit-price-reduction requests from contractors by adjusting non-wage production costs (i.e., the use of cheaper intermediate inputs). Future studies should discuss a relationship between unfair unit-cost reduction and non-wage production costs so as to improve the reliability of the fact that unfair trade practices can have a direct impact on the wages of subcontractor workers.

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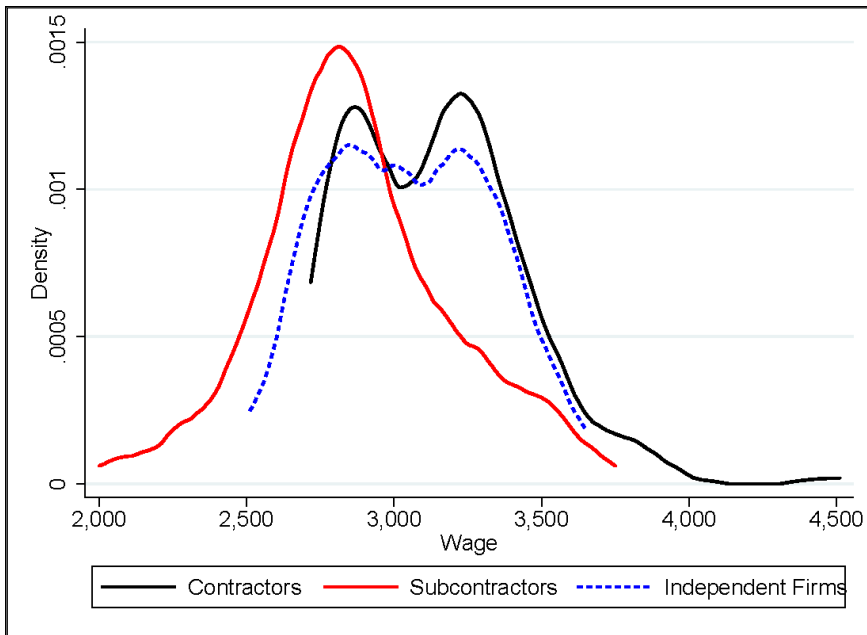
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APPENDIX



Source: Calculated using The Survey on Labor Conditions by Employment Type provided by the Korean Ministry of Employment and Labor.

〈Figure A.1〉 Average monthly wages across firm size



Notes: The survey data that consists of 1,000 small- and medium size firms are used. Among those firms, only 619 firms have wage information. Wages are measured in thousands of Korean Won.

〈Figure A.2〉 Kernel density estimation for wage: contractors versus subcontractors

초록

원하청기업간 불공정거래가 하청기업의 임금에 미치는 영향 분석

구경현*, 황운중**

원하청업체간 협상력 차이로 인한 불공정거래가 하청업체 임금에 미치는 영향을 실증분석 하였다. 본 연구를 위해 하청기업이 원청업체로부터 납품단가 인하 요구를 받았는지, 불합리한 단가인하 요구를 실제로 수용하였는지 여부에 대한 기업 설문조사를 활용하였다. 실증분석 결과, 불공정한 단가인하는 하청업체 임금에 부정적인 영향을 미치는 것으로 나타났고 통계적으로 유의하였다. 단가인하가 임금에 미치는 부정적인 영향은 매출 상위 원청업체에 대한 판매 비중이 높을수록 큰 것으로 추정되었다. 원하청기업간 불공정거래가 하청기업의 임금하락 압력으로 작용할 수 있다는 사실을 실증적으로 입증하였다는 점에서 본 연구가 시사하는 바가 크다.

핵심주제어: 협상력; 임금격차; 하청기업; 불공정거래, 단가인하

JEL Classification: J31, L11

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