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Labor-Management Communication about Training

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Abstract (150 words)

We empirically examine the labor-management communication about the in-house training program, and its relation to the actual training policy such as off-the-job training and on-the-job training. A governmental data from Japan, Survey on Labor management Communication reveals that the institutions of labor-management communication may affect the interests of employers and employees. This effect is not always in favor of in-house training program; e.g. formal collective bargaining may crowd out the interests of workers in training, partially due to the time/effort constraint. As a matter of fact, while the active labor-management communication about training is related to the actual provision of off-the-job training, it is not to the on-the-job training. We further find the consistent evidence by exploiting the indirect proxy of training policy through the wage structure of establishments. The willingness of workers to communicate the training program is related to the long-range human resource practices such as steep wage-tenure profiles.

Keyword: Training, Collective Bargaining, Labor-Management Communication

JEL Classification: M53, J53, J24

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1. Introduction

In the literature of training, three factors have provided the analytical perspective; that is, *the place* (on-site, off-site), *the time* (on-the-job, off-the-job) and *the fund* (firm sponsored, worker sponsored). The seminal work by Gary Becker constructs a general model to rationally connect these factors, by using the idea of specific human capital (Becker, 1964). The Becker's economic model delivers the broad basis to understand the labor market phenomena. In the labor economics, one of the focuses has been on the efficiency of training provision. The direct effect of training on productivity has been widely examined (e.g. Ichniowski et al., 1997; Bartel, 2004). The indirect effect has been examined in the management literature; for example, Neirotti and Paolucci (2013) discussed how the training is related to the organizational strategy that enhances the productivity of firm. Although the training itself improves the productivity of firm, its economic efficiency may not be fully achieved if the cost-sharing (i.e. combination of *the place*, *the time* and *the fund*) deviates from the efficient rule. Typically, when employers invest in the general skill training, they are likely to provide it insufficiently as the effect of so called "poaching externality" (e.g. Acemoglu and Pischke, 1998). The literature discussed theoretically and empirically how to avoid the inefficiency mainly by intervening the cost-sharing as institutions (e.g. Autor, 2001; Moen and Rosén, 2004).

The additional point of view has not been fully examined; namely, who and how decide the contents of training. This is partially because the traditional arena of training has been occupied by the public vocational training (Zimmerman et al. 2012). Off-site, off-the-job and worker (or government) sponsored training usually links to the public qualification system, and it is obvious, in the case, who decide the contents of training. However, the in-house training is recently getting widespread, especially in European countries (Bassanini et al. 2006). Edward Lazear proposed an economic model that endogenously determine the contents of in-house training; i.e. the composition of firm-specific and general skill. The driver of his model is independent decision-makings of employers and employees who are under the pressure of the labor markets competition (Lazear, 2003). On the other hand, presumably employers have the initiative to decide the in-house training, since the worker is subject to the order by manager in the workplace. However, because the unobservable effort of trainee is crucial for the achievement of training, the managers may have to make the agreement about the training program with the worker. This reasoning suggests that the communication between employers and

employees is another key factor to understand the recent issue (Zimmerman and Subramanian, 2013).

Based on above understanding, we define the purpose of research to empirically document the communication about the in-house training between managers and workers at the establishment level. The institutions of industrial relations have already formed the channels of communication (Cappelli and Neumark, 2001; Kato and Owan, 2011). However, the literature tends to assume such institution as a technological device that automatically works when adopted (Bloom et al., 2019). Actually, who and how communicate about training in the company is an important endogenous variable, depending on the institutional arrangements, the organizational practice as well as the pressure from the labor markets.

In this article, by using the microdata from Japanese governmental surveys, we examine how the workers and managers are willing to communicate about the training program, given the institutional arrangements of labor-management communication. In addition, we also examine how their interests in training reflect the actual training policy in the establishments.

Our short list of findings is as follows. Firstly, the adoption of labor union may hinder the interest in training, while the informal institutions such as Joint Labor-Management Committees and Shop-floor Committees do not have the negative relation with the willingness to communicate the training program (Section 2). Secondly, the interests in communication may enhance the implementation of off-the-job training, especially from the perspective of workers. Interestingly, these factors do not relate to the implementation of on-the-job training (Section 3). We interpret these findings by the trade-off between the formal channel and the communication about training. Finally, we additionally discussed the relation between the wage structure of establishment and the willingness of communication. The long-range human resource management is correlated to the interests of workers in training (Section 4). Overall, we conclude that the institutional arrangement of labor-management communication may affect the topics as much as the time horizon of communication, when we discuss the process of decision making of in-house training (Section 5).

2. Crowding out the training communication?

To examine the role of labor-management communication about the training program, the first approach is to empirically grasp the current situation of such communication. We obtain the data from *Rōshi Komyunikeishon Chōsa* (Survey on Labor-management Communication; hereafter, SLmC) that is conducted by Japanese government every 5 years. The aim of survey is to document the situation of labor-management communication at the establishment level, through asking for the information about the institutional arrangements that support the labor-management communication. In addition, SLmC collects the subjective evaluations by employers and employees on the actual activities. Especially, since SLmC questions what kind of topics managers and workers put more importance during the actual labor-management communication, we can extract, from this dataset, their willingness to make communication about the training[1].

The second advantage of using SLmC is in its sampling strategy. SLmC randomly deliveries the questionnaire to the manager of establishment that has at least 50 employees in the private sector. At the same time, SLmC asks the manager to delivery questionnaires for randomly selected 5 workers at the same establishment. Thanks to this two-stage sampling framework, we can compare the answers of workers with that of manager in the same establishment.

On the other hand, the sample size of SLmC is relatively small, around 2.5 to 3 thousand establishments and around 3.6 to 4 thousand workers per year. The number of establishments that completes the worker survey is about 5 hundred. To amplify the sample size, we accumulate 2004, 2009 and 2014 survey to overview the labor-management communication and training.

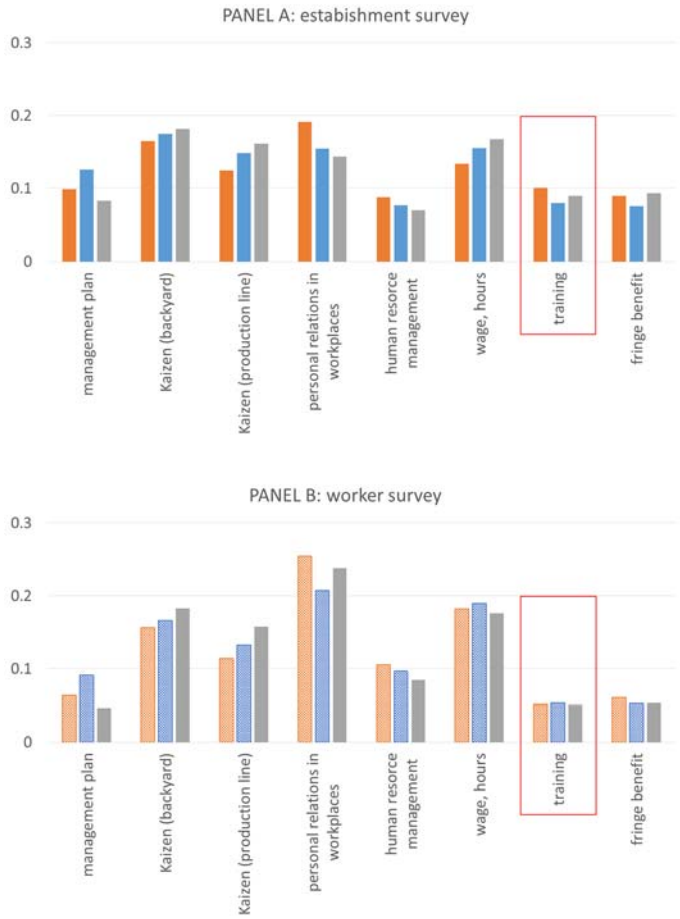
Our first interest is to see how eager the employers and employees to talk about the training. SLmC asks employers as well as employees for specifying the important topic that they consider for the labor-management communication[2]. Since the answer is based

[1] Exactly speaking, the word that SLmC uses is just "訓練 (training)" and it does not specify the in-house training. In this article, however, we interpret it as the in-house training, because the survey always asks the situation inside of establishment.

[2] Actually question is 「貴事業所（あなた）はどういう面での労使コミュニケーションを重視しますか。」("Which aspects of labor-management communication do you put importance?") and these wording is exactly the same between in 2004, 2009 and 2014.

on multiple choices, we adjusted the frequency by the inverse of number of choices that the reviewee chose. The next Figure 1 shows the distribution of the average willingness to talk about each topic for employers as well as for employees.

Figure 1: Distribution of Interested Topic on Labor-Management Communication



Source) SLmC 2004, 2009 and 2014, establishment and individual survey. Unweighted aggregation by authors. Number of observation is 2,546 in 2004, 3,228 in 2009 and 3,195 in 2014 for establishment survey; and 4,035 in 2004, 3,593 in 2009 and 3,457 in 2014 for individual survey. Average number of choice that they actually made is 4.0 in 2004, 4.2 in 2009 and 4.0 in 2014 for employers; and 2.9 in 2004, 3.0 in 2009 and 3.0 in 2009 for employees. The choice of "others" is not shown. Each density is calculated as the aggregated frequency that they answer the topic is important on labor-management communication in general, deflated by the number of choices that each chose.

Apparently, the training is not considered as the highest priority issue in the labor-management communication: only 8 to 10% of employers and 5 to 6% of employees would talk about the training if they must choose single topic. Personal relations in workplaces or wages and hours are more likely to be discussed in the labor-management

communication. However, this does not mean that the training is not talked in the labor-management communication at all. 44% (39%, 43%) of employer answers that the training is an important topic for labor-management communication in 2004 (2009, 2014)[3]. Since the employers who want to talk about training is likely to take multiple topics, compared to the employers who do not talk about training (5.2 topic vs. 3.1 topic in 2004, 5.7 vs. 3.2 in 2009, and 5.7 vs. 3.1 in 2014), the average of adjusted frequency of training looks discounted. Training does not have the highest priority, but still attract the interest of employers.

On the other hand, employees are not always interested in training as indicated in Figure 1 Panel B. Even the gross frequency counts 18% (20%, 20%) of employees show their interests in training in 2004 (2009, 2014), which is only half of employers' side[4]. Workers are more likely to talk about the contemporaneous benefit such as wages and hours, personal relation in the workplaces rather than longer-term beneficial opportunities.

Figure 1 indicates that the willingness to communicate the training program is not always high and there is a gap between employers and employees. The next question is how the institutional arrangements for labor-management communication are associated with the willingness and its gap.

In the Japanese establishments, the labor-management communication boils down to three tiers; (A) the statutory collective bargaining through union (*Dantai Koshō*; hereafter union), (B) the semi-formal summit meeting without legal basis (*Rōshi Kyōgikai*; joint labor-management committees, hereafter JLMC), and (C) the informal meeting at the workplace level (*Shokuba Kondankai*; shop-floor committee, hereafter SFC)[5].

(A) Union is a formal association that has the legal basis. Formally, it is organized voluntarily, and the closed shop agreement is not illegal but not enforced in courts in Japan. The collective agreement through the bargaining with union has legal backups than a private employment contract. Sometimes, the collective agreement automatically overwrites individual contracts, and the breach of collective agreement is not only under

[3] Since we will use the matched sample with other governmental survey, we do not use sampling weights to keep the consistency in this article. The officially published figures are reported by using sampling weights as 40.7% in 2004, 39.5% in 2009, and 46.9% in 2014.

[4] As in footnote 4, these figures are calculated without weights. The officially published figures are reported with weights as 19.0% in 2004, 19.4% in 2009, and 22.2% in 2014.

[5] A brief summary of the institutions of Japanese labor-management communication can be found in Yamashita (2005). When employers use the exemption from the legal regulation (such as the labor hour), the Japanese Labor Law usually requires the mutual collective agreements between employers and employees. Therefore, a big company that use multiple exemptions are likely to prepare for multiple institutions that labor and management jointly decide. While these institutions are similarly called such as 労使委員会 (Labor-Management Committee), each function is restricted to the particular regulation. As for JLMC and SFC, Kato (2003) summarizes the role and effects.

the liability of tort, but also constitutes unfair labor practice. Therefore, the items that should be negotiated in this formal channel is already determined by Labor Union Law. The law specifies them as wages, hours, transfers, fringe benefits and so forth. Those items are basically those that affects the employees' working condition directly, though the law does not prohibit to include other items. In our data, the survey does not ask whether they are doing statutory collective bargaining; instead, the survey only asks whether labor union is organized in the company or not. According to the regulation, we equate the existence of union with the existence of statutory collective bargaining in this article.

(B) JLMC is semi-formal in that it does not have any legal basis. The agreement through JLMC is as flexible as a private contract between employers and employees. As results, JLMC usually includes broader and ambiguous topics such as the training, business plans, design of Kaizen activities and so on. Since JLMC is organized as a summit meeting by the representatives of employers and employees, only the agenda of each topic is usually discussed, and they do not talk customizations to each worker.

(C) SFC is an informal meeting organized at the workplace (tactics unit) level. The size and frequency of the meeting varies between companies, but the topic discussed in SFC is commonly related to the actual management of workplaces rather than related to the agenda of company. Since the workplace is the crucial unit in the business activity, the information sharing at this level is always cared as the management practice. A characteristic of SFC is that it is organized as a face-to-face group discussion, whereas the typical information sharing at workplace is done through accumulating bilateral communications between individuals.

As a whole, the institutional arrangements about labor-management communication is characterized as the multiple vertical tiers. From the establishment survey of SLmC, the next Table 1 reports the frequency of institutional arrangements about labor-management communication at the establishment level, and its combinations.

Table 1a: Adoption of Union, JLMC, and SFC at Establishment Level

	Union	Joint Labor-manegement Committee	Shopfloor Committee	Non of them	# of observation
2004	1360	1329	1352	525	2546
	0.53	0.52	0.53	0.21	
2009	1510	1583	1833	751	3228
	0.47	0.49	0.57	0.23	
2014	1596	1575	1809	686	3195
	0.50	0.49	0.57	0.21	

Source) SLmC 2004, 2009 and 2014, establishment survey. Unweighted aggregation by authors. Upper column shows the aggregated number of establishments that answer they have prepared for the institution. Lower column is the share.

Table 1a shows, for each level of communication, about half of establishments prepares for institutions, and the establishments that have no institutional arrangement shares only about 20%. These institutions are expected to be mutually depended, because it is natural for employers and employees to strategically use the multiple channels depending on the situation.

Table 1b: Mutual Dependence of Adoption of Union, JLMC, and SFC at Establishment Level

PANEL A

		JLMC		
		NO	YES	subtotal
uion	NO	37.6	9.0	46.6
		41.8	11.5	53.3
		41.3	8.8	50.1
	YES	10.2	43.3	53.4
		9.1	37.6	46.7
		9.4	40.5	50.0
	subtotal	47.8	52.2	100.0
		50.9	49.2	100.0
		50.7	49.3	100.0

PANEL B

		SFC		
		NO	YES	subtotal
union	NO	24.0	22.5	46.5
		27.1	26.2	53.3
		24.9	25.1	50.1
	YES	22.8	30.6	53.5
		15.9	30.8	46.7
		18.3	31.6	49.9
	subtotal	46.9	53.1	100.0
		43.0	57.0	100.0
		43.3	56.7	100.0

PANEL C

		SFC		
		NO	YES	subtotal
JLMC	NO	27.8	20.0	47.8
		29.0	21.9	50.9
		28.0	22.8	50.8
	YES	19.1	33.1	52.2
		14.0	35.1	49.1
		15.3	34.0	49.3
	subtotal	46.9	53.1	100.0
		43.0	57.0	100.0
		43.3	56.7	100.0

Source) SLmC 2004, 2009 and 2014, establishment survey. Unweighted aggregation by authors. The share of groups that have prepared for each combination of institutions. Upper/middle/lower column shows the share of cell in 2004/2009/2014 respectively. The corresponding sample size is shown in Table 1a.

The adoption of SCB and that of JLMC are mutually correlated, while the correlations are stable through years. In Panel A, for example, the sum of diagonal factors shares around 80%. Both of institutions have similar form, a summit meeting between the representatives of employer and those of employees, but the extents of formality are different each other. It is understandable that two institutions are used complementarily, which may result in positive correlation between the adoption of union and that of JLMC. On the other hand, SFC looks slightly independent from other two institutions. The sum of diagonal factors, in Panel B between union and SFC, is 54.6% in 2004 and 57.9% in 2009; and it is 60.9% in 2004 and 64.1% in 2009 in Panel C between JLMC and SFC.

The next question is how these institutions are related to the gap of willingness to discuss the training program. To see the statistical association, we regress the difference of adjusted frequency of choosing training from manager's evaluation to the mean of worker's evaluations on three institutional variables with controls. While our main interest here is the association between the gap of willingness and the adoption of institutions for labor-management communication, we additionally pick up the willingness itself of employer's and employees'[6], and the standard deviation of workers' evaluation within the establishment as the dependent variable. The estimated results are summarized in the next Table 2.

[6] When we use the employer's evaluation as the dependent variable, we may not need control for average individual attributes, because the attributes who answer workers' survey is nothing to do with the attributes of manager. Here, to make the comparison easier, we keep the same sets of explanatory variables between estimations, though whether control or not does not affect the estimated results substantially as shown in Appendix A.

Table 2: Institutional Arrangements and Interests in Training

(adjusted frequency to choose training as the topic of labor-management communication)

dependent variable	manager's evaluation - mean of worker's evaluations mean = 0.034 s.d.= 0.129			manager's evaluation mean = 0.088 s.d.= 0.120			mean of worker's evaluations mean = 0.053 s.d.= 0.058			sd of worker's evaluations mean = 0.089 s.d.= 0.084		
	(1)			(2)			(3)			(4)		
	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value
Union	-0.038	0.010	0.00	-0.049	0.009	0.00	-0.012	0.004	0.01	-0.018	0.006	0.01
Joint Labor-Management Committee	0.009	0.009	0.35	0.007	0.009	0.44	-0.002	0.004	0.61	0.001	0.006	0.83
Shopfloor Committee	-0.004	0.005	0.37	-0.003	0.004	0.52	0.001	0.002	0.50	0.001	0.003	0.76
estabishment control	YES			YES			YES			YES		
average individual attributes control	YES			YES			YES			YES		
# of observation	1,620									1615		
unit of observation	establishment											
R-sq	0.109			0.132			0.122			0.114		

Source) SLmC 2004, 2009 and 2014, establishment and worker survey. Unweighted estimation by authors. All of estimation is conducted by OLS. Constant and year dummy for 2009 and 2014 are included as other explanatory variables. Sample is limited to the establishments that complete both of employers' and workers' survey. Establishment controls include dummies for firm size (5 categories plus base), prefecture (46 categories plus base), and 2-digit industry (85 categories plus base). Average individual attributes controls include age, tenure, gender, part-time, occupation (4 categories plus base) and rank (2 categories plus base) in the company, as the mean of each variable within the establishment. In Appendix A, we show the different results with/without controls.

Since the mean of gap exhibits positive (0.034) according to (1), the interest on training is stronger in employers' side rather than in employees' side, that is already shown in Figure 1. (1) also shows that the existence of labor unions may fill the gap statistically significantly. The magnitude of coefficient (-0.038) in (1) implies that the existence of formal collective bargaining explains almost all of average gap.

However, this is because the adoption of union hinders the interests in training more in employers' side rather than in employees' side. (2) shows the coefficient for union is estimated negatively and its magnitude shares about 56% of the employers' average, whereas (3) tells that it shares about 22% in employees' side. On the flip side, the employers (as well as employees) with union show more interest in wages and hours (not shown). This may be because the labor-management communication through the formal collective bargaining may be occupied by the topic that is specified in the law such as wages and hours. It may be plausible that, when the time or the effort for labor-management communication is constraint, the formal institution of communication may affect the allocation of topic that they discuss collectively. Alternative possible interpretation is that JLMC takes the substitute of formal collective bargaining, given two

institutions are mutually dependent as shown in Table 1, while the estimated coefficients of JLMC are generally weak.

The semi-formal institution such as JLMC may have different relation to the communication about the training program, especially for employers' side. (2) shows the weak statistical association between the adoption of JLMC and their willingness to talk about the training. It may be remarkable that we do not find this statistical tendency in employees' side as in (3). Because JLMC is usually initiated by employers, it may be plausible that the adoption of JLMC is relatively independent from employees' perspectives, or the adoption of JLMC cannot affect the employees' interests. Contrary to union and JLMC, SFC does not have significant relation with the interests in training. However, as in (2) and (3), the coefficients are estimated as positive commonly for employers and employees. This is consistent to the information sharing at grass-root level may shed lights on the training opportunity.

Before summarizing the findings, the validity of cross-sectional variation of institutions should be discussed further, since all findings are based on the between-establishment variation of SLmC. For example, the strong positive correlation between union and JLMC may contaminate the consistency of coefficients for these two variables on employer's interests, which is estimated oppositely in (2). To cope with this problem, the normal approach is to construct the panel and/or to search for the instrumental variable. However, the exogeneity of adopting institution is difficult to find generally. As a matter of fact, even when we construct the establishment panel data from SLmC, the change of institution within establishment is rarely found as discussed in Kambayashi and Kato (2015). Therefore, we do not address the causal relation in this research; still our findings may shed light on the new aspect of labor-management relation.

Overall, the interests of managers and workers in training are related to the institutions of the labor-management communication. But the formal mechanism such as labor union is possible to hinder such interests. It may be because the resource constraints on the communication may induce both sides to input more time and/or effort to the topics that is guided by Labor Union Law. The formal support for collective bargaining may crowd out the communication on training. In this case, the informal channel such as JLMC or SFC can take a role, though the datasets have not yet provided reliable evidences.

3. Labor-Management Communication and Training Policy

The next natural question is whether the labor-management communication about the training opportunity is related to the actual training policy of establishments. To examine such empirical relation, we merge SLmC with other governmental data; Nōryoku Kaihatsu Kihon Chōsa (Basic Survey of Human Resource Development; hereafter SHRD) that conveys the information on the actual training policy.

SHRD is a cross-sectional survey that is yearly conducted by Japanese Government for firms, establishments and workers. Especially, SHRD asks establishments whether they conducted the off-the-job training (hereafter, off-JT), and also whether they implemented the on-the-job training (hereafter, OJT)[7]. Therefore, by matching SLmC with SHRD at the establishment level, we can confirm the statistical association between the labor-management communication about the training and the actual training policy.

Since the survey asks the actual behaviors during the whole year before the survey, we link SLmC 2009 to SHRD 2010, and SLmC 2014 to SHRD 2015. Although the sample size of SHRD is slightly larger than SLmC, we find only 465 matched establishments for two years. The matching rate is about 5% from SHRD side and about 7% from SLmC side[8]. In addition, as shown in the previous section, the workers' questionnaire of SLmC is delivered only for 20% of establishments. The sample size is finally around 75 establishments that collects the all of information on manager's communication, workers' communication as well as the establishments' training policy. Because of the small sample size, therefore, we should pay attention that the following regression results may not provide statistically significant results.

The interested explanatory variables are those from SLmC as in the previous section; the manager's willingness to communicate the training opportunity as well as of workers' one. The adoptions of institutions are also concerned. At first, we take the indicator variable about the implementation of off-JT in the establishment. And we regress it on both variables of manager's evaluation and workers' evaluation at the same time. The summary of estimated results is in the next Table 3.

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[7] More precisely, in the survey, the on-the-job training is defined as the scheduled on-the-job training.

[8] 232 establishments from 3228 SLmC 2009 establishment (7.2%) and from 4512 SHRD 2010 (5.1%). 233 establishments from 3195 SLmC 2014 establishment (7.3%) and from 4416 SHRD 2015 establishment (5.3%).

Table 3: Communication on Training and Off-the-Job Training

dependent variable	off-the-job trainig (=1: implement, =0: dormant)														
	mean = 0.861, s.d.=0.348														
estimation method	OLS														
sample	SLmC manager + SLmC worker + SHRD														
	(1)			(2)			(3)			(4)			(5)		
	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value
manager's evaluation	0.348	0.140	0.07	0.158	0.045	0.18	0.076	0.078	0.33	0.108	0.192	0.58	0.102	0.089	0.26
mean of workers' evaluation	0.111	4.360	0.98	-5.522	1.832	0.20	-1.805	0.826	0.03	-0.301	2.096	0.89	-1.387	0.935	0.14
union				-1.661	0.235	0.09	-0.083	0.109	0.45	-0.307	0.429	0.49	-0.121	0.125	0.34
JLMC				0.293	0.109	0.23	0.138	0.116	0.24	0.139	0.335	0.69	0.217	0.126	0.09
SFC				0.486	0.196	0.24	0.146	0.092	0.12	0.497	0.268	0.09	0.150	0.105	0.16
establishment attributes control	YES			YES			NO			YES			NO		
average individual attributes control	YES			YES			NO			NO			YES		
# of observation	79			79			79			79			79		
unit of observation	establishment			establishment			establishment			establishment			establishment		
R-sq	0.984			1.000			0.112			0.895			0.325		

Source) SLmC 2009, 2014 and SHRD 2010, 2015. Unweighted estimation by authors. Constant and year dummy for 2014 are included as other explanatory variables. Establishment attributes controls include dummies for firm size (5 categories plus a base), prefecture (27 categories plus a base), and 2-digit industry (28 categories plus a base). Average individual attributes controls include the willingness to communicates of workers, age, tenure, gender, part-time, occupation (4 categories plus a base) and rank (2 categories plus a base) in the company, as the mean of each variable within the establishments. As results, the number of explanatory variables is 74 in (1) and 77 in (2). Given the number of observations is 79, the remaining degree of freedom is 4 and 1 after adding constants, respectively. Summary statistics for the sample is shown in Appendix B.

Interestingly, as shown in (1), the manager's willingness to communicate about training is accompanied with the implementation of off-JT, though the workers' willingness does not seem to be related to the actual training policy. Once after controlling for the institutions, however, the estimated coefficients for the manager's evaluation drops by half and loses its statistical significance. Instead, the existence of union shows a sharp negative correlation with the implementation of off-JT. The crowding out effect of formal institution may be found not only in the willingness to communicate but also in the actual training policy of off-JT.

Since some of the estimated coefficients show extremely large magnitude in (2), the above interpretation may have to include a footnote. The results may be affected by the small size of sample and the lack of degree of freedom; as a matter of fact, the estimation of (2) includes 77 explanatory variables and the remaining of degree of freedom is only 1. To confirm this interpretation and to keep larger degree of freedom, we remove both of the establishment attributes and the individual attributes from control variables in (3).

Similarly, in the case of (4) and (5), we only drop the individual attributes and the establishment attributes respectively.

Although their statistical significances are generally weak, these three specifications estimate the coefficients in more reasonable range. As a whole, (2) to (5) show consistent signs that the manager's willingness to communicate about training opportunity is positively related to the actual off-JT, and the existence of union is negatively related to it.

On the contrary to off-JT, the implementation of OJT does not correlate to neither the communication about training nor the preparation for institutions. In the next Table 4, we replace the dependent variable to OJT and keep the other specification as they are in Table 3, to see the statistical association between the willingness to communication and OJT.

Table 4: Communication on Training and On-the-Job Training

dependent variable	on-the-job trainig (=1: implement, =0: dormant) mean = 0.797, s.d.=0.404														
estimation method	OLS														
sample	SLmC manager + SLmC worker + SHRD														
	(1)			(2)			(3)			(4)			(5)		
	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value
manager's evaluation	0.172	0.354	0.65	-0.235	0.363	0.64	0.103	0.086	0.24	-0.163	0.334	0.64	0.068	0.101	0.51
mean of workers' evaluation	1.836	11.048	0.88	-9.524	14.723	0.63	-0.021	0.918	0.98	0.930	3.644	0.80	-0.490	1.065	0.65
union				-3.993	1.891	0.28	0.098	0.121	0.42	-0.497	0.745	0.52	0.100	0.143	0.49
JLMC				0.587	0.877	0.62	0.147	0.128	0.26	0.421	0.583	0.48	0.105	0.143	0.47
SFC				0.780	1.574	0.71	0.215	0.105	0.04	0.161	0.466	0.74	0.224	0.120	0.07
establishment attributes control	YES			YES			NO			YES			NO		
average individual attributes control	YES			YES			NO			NO			YES		
# of observation	79			79			79			79			79		
unit of observation	establishment			establishment			establishment			establishment			establishment		
R-sq	0.925			0.987			0.204			0.764			0.351		

Source) SLmC 2009, 2014 and SHRD 2010, 2015. Unweighted estimation by authors. Constant and year dummy for 2014 are included as other explanatory variables. Establishment attributes controls include dummies for firm size (5 categories plus a base), prefecture (27 categories plus a base), and 2-digit industry (28 categories plus a base). Average individual attributes controls include the willingness to communicates of workers, age, tenure, gender, part-time, occupation (4 categories plus a base) and rank (2 categories plus a base) in the company, as the mean of each variable within the establishments. As results, the number of explanatory variables is 74 in (1) and 77 in (2). Given the number of observations is 79, the remaining degree of freedom is 4 and 1 after adding constants, respectively. Summary statistics for the sample is shown in Appendix B.

Different from Table 3, the coefficients for willingness to communication are estimated with larger standard errors and signs are not consistent between specifications.

This is true for the coefficients for institution variables. The only meaningful coefficients may be those for SFC, that slightly indicates positive correlation to OJT.

The findings in Table 3 and Table 4, in total, implies that the labor-management communication about training, especially manager's willingness, is more related to formal training policy in the establishments such as Off-JT. OJT is possible to be determined by on-the-spot discussion, and the central labor-management communication is relatively independent from them.

4. Indirect Proxy of Training Policy

Although Table 3 and Table 4 is a direct evidence for the correlation between the labor-management communication and actual training policy, the statistical association is not show in a robust way, mainly due to the small size of matched sample. Here we will try to add another indirect evidence, by exploiting the fact that the wage structure of establishments reflects the training policy. For example, given the human capital accumulation, the active training policy is associated with the steepness of wage-tenure profile. Or, when the manager relies on the perishable effort of workers, they may use the bonus system.

These discussions remind us of another aspect that our key variable is related to the time-horizon of managers and workers. Namely, compared to wages and hours, the training is presumably the issue for longer-term. If managers and workers are willing to communicate about training, rather than wages and hours, they may be more interested in longer range of career. At the same time, the ratio of bonus within payments and the length of the steepness of wage-tenure profile partially captures the time-horizon of establishment's human resource policy. The steeper wage-tenure profile is the reflection of implicit long-term contracts between employer and employee to enhance the long-run concern of workers. The bonus payments are strongly connected with the yearly outputs of worker, establishment and firm, and it is good to incentivize workers' short-term concern. Therefore, when managers and workers are more willing to communicate about training, such establishments may adjust the training policy by lowering ratio of bonus or by steeping wage-tenure profile, in order to induce the workers' effort toward investing in the future rather than toward the current productive behavior.

To confirm this idea, we match SLmC to another governmental survey *Chingin Kōzō*

Kihon Tōkei Chōsa (Basic Survey on Wage Structure; hereafter BSWS). This survey collects the wage information of individual worker, by asking the human resource manager of establishment for copying the pay roll record. Therefore, the wage information in BSWS is detail so that we can decompose each individual payment into the scheduled payment, the overtime payment, allowances, and the bonus. By dividing the scheduled payments by their scheduled hours worked, we deduce the hourly base wage for each worker. Because we have flexible components such as overtime and bonus, the base wage is perceived as more stable schedule of wages in the establishments. In addition, we can expect relatively high matching probability, because the sample size of BSWS is large, over 50 thousand establishments and over 1 million workers per year[9].

We summarize the mean of bonus ratio and the wage-tenure profile in each establishment by using individual observations of BSWS. As for the mean of bonus ratio, we only take the average of individual bonus ratios in the establishment. To capture the wage-tenure profile, we make four groups, depending on the percentile of tenure distribution; namely, 25% (5 years), 50% (13 years) and 75% (24 years). Then, we calculate the average base wages for each group, relative to the first group who has only less than 5-year tenure in the same establishment. Then, we take the difference between the second group and third group, that shows the additional steepness from 14-year tenure to 24-year tenure. Similarly, we compute the additional steepness from 24-year above by subtracting the third group from the fourth group. At last, we attach the information to SLmC at establishment level. Resulting sample size is 530[10].

We regress the bonus ratio and the steepness of tenure profile on the communication variables of as well as the institution variables. The idea of estimation is substantially the same as the empirical model in Table 3 and Table 4, except for the sample size. In addition, when we regress the mid-career steepness and the steepness for the last stage of career, we control for the steepness before the period. As for the bonus ratio, we control for the steepness of profile to take the long-term interests into account. The estimated results are summarized in the next Table 5.

[9] The downside of BSWS is that they only ask fulltime workers for their educational attainment. To examine the communication about the training opportunity, its outcome is highly probable to be different from workers' educational levels. Therefore, including education variables in the estimated model is necessary and we limit our analysis into fulltime workers. Although resulting loss of sample is about 25%, this limitation of data may not affect our conclusion, since the training is usually relevant to fulltime worker not part-time worker.

[10] For regressions, we lose 4 observations due to missing variables in individual attributes.

Table 5: Wage Structure and Communication on Training

dependent variable	Steepness of Wage-Tenure Profile												average bonus ratio				
	5-13 yrs relative to 0-5 yrs mean = 0.166, s.d. = 0.229			13-24 yrs relative to 5-13 yrs mean = 0.224, s.d. = 0.229			over 25 yrs relative to 13-24 yrs mean = 0.153, s.d. = 0.276						mean = 0.194, s.d. = 0.080				
estimation method	OLS																
sample	SLmC manager + SLmC worker + BSWS																
	(1)			(2)			(3)			(4)			(5)			(6)			(7)			(8)		
	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value
manager's evaluation	-0.032	0.085	0.71	-0.028	0.087	0.75	0.040	0.081	0.62	0.070	0.085	0.41	-0.085	0.095	0.37	-0.059	0.099	0.55	-0.036	0.027	0.18	-0.036	0.027	0.18
mean of workers' evaluation	-0.385	0.266	0.15	-0.385	0.267	0.15	0.333	0.235	0.16	0.356	0.235	0.13	-0.110	0.297	0.71	-0.034	0.292	0.91	0.122	0.077	0.11	0.131	0.077	0.09
union				-0.004	0.033	0.89				0.077	0.033	0.02				0.047	0.036	0.20				-0.003	0.010	0.74
JLMC				0.021	0.035	0.55				-0.009	0.030	0.75				0.084	0.034	0.01				0.020	0.010	0.04
SFC				0.015	0.026	0.58				-0.017	0.022	0.44				-0.039	0.027	0.16				-0.005	0.007	0.43
5-13 yrs relative to 0-5 yrs							-0.355	0.051	0.00	-0.355	0.050	0.00	-0.284	0.068	0.00	-0.297	0.067	0.00	0.009	0.016	0.59	0.006	0.016	0.73
13-24 yrs relative to 5-13 yrs													-0.438	0.086	0.00	-0.462	0.087	0.00	0.059	0.017	0.00	0.054	0.017	0.00
over 25 yrs relative to 13-24 yrs																			0.059	0.013	0.00	0.052	0.013	0.00
average bonus ratio	-0.249	0.186	0.18	-0.264	0.192	0.17	0.367	0.178	0.04	0.328	0.180	0.07	0.882	0.202	0.00	0.765	0.198	0.00						
establishment attributes control	YES			YES			YES			YES			YES			YES			YES			YES		
average individual attributes control	YES			YES			YES			YES			YES			YES			YES			YES		
# of observation	530			530			530			530			530			530			530			530		
unit of observation	establishment			establishment			establishment			establishment			establishment			establishment			establishment			establishment		
R-sq	0.336			0.337			0.417			0.429			0.460			0.482			0.568			0.575		

Source) Matched sample of SLMC 2004, 2009, 2014 and BSWS 2004, 2009, 2014. Unweighted estimation by authors. Constant and year dummy for 2009 and 2014 are included as other explanatory variables. Establishment controls include dummies for firm size (5 categories plus a base), prefecture (46 categories plus a base), and 2-digit industry (72 categories plus a base). Average individual attributes controls include age, tenure, gender, occupation (4 categories plus a base) and rank (2 categories plus a base) in the company, as the mean of each variable within the establishments. The bonus ratio is the ratio of bonus payments of previous year to yearly total payments that is the sum of monthly payments multiplied by 12 and bonus payments. Summary statistics for the sample is shown in Appendix C.

While the number of observation increased seven times as much as in Table 3 and 4, the communication variables and institutional arrangements do not show the correlation to the steepness of tenure profile, for the early stage of career as in (1) and (2). Rather, the estimations report the positive correlations of communication and of institutions to the steepness for mid-career tenured workers in (3) and (4). Especially, both of the workers' willingness to communicate and the existence of union are positively correlated to the steepness of profiles for mid-career workers. These findings look contradicting to the negative coefficients in Table 3. One interpretation is that the workers' interest as well as the union's interest may be in the training opportunity that increase the employability at the mid-career. The other interpretation is that the steepness of tenure profile in mid-career may include the part of short-term fluctuation, that is found in the positive correlation to the average bonus ratio. In this case, the short-term concern, such as wages and hours, can be included into the estimated coefficients in (4).

The bonus ratio shows the positive correlation to the workers' willingness to communicate about training. The estimated results show the negative correlation to manager's willingness expectedly, but they have low statistical significance. At most, the bonus ratio may not be related to the interests of communication about training. This finding is not inconsistent to the expected relation.

Therefore, in our dataset, although the empirical relation between wage structure and

the interest of communication has not fully proved, our findings are not inconsistent with a hypothesis that the workers who concern longer-term are willingness to talk about training in the labor-management communication.

5. Discussion and Concluding Remark

To sum up our findings, firstly, the institutions of labor-management communication may affect the interests of employers and employees. This effect is not always in favor of in-house training program; e.g. formal collective bargaining may draw more attention to the contemporaneous working condition such as wages and hours worked. This is consistent with another finding that the willingness to communicate the training program is related to the long-range human resource practices such as steep wage-tenure profiles.

Of course, our evidence is limited to prove the causal effects of institutions on the communication, mainly due to the small sample size and the insufficient exogenous variation of key variables. Given the structure of SLmC, the improvement of quality and quantity of sample should be continuously examined.

More importantly, the detail investigation on the mechanism of labor-management communication should be needed. In this research, we discuss only the direction of communication, by using the share of topics. On the other hand, some of institutions is possible to enhance the quantity of communication, and the increase in quantity may affect the share of topics, similar to the income effect of consumption. Actually one alternative interpretation of our regression is that informal bargaining such as JLMC takes the substitute of formal bargaining. The existence of union may reduce the intensity of communication about training through the formal channel, but if these institutions enhance the quantity of communication as a whole, they are likely to discuss about the training through other channel. Asymmetry between manager's evaluation and workers' evaluation is another remaining issue. While labor union can be assumed to be initiated by workers, JLMC is likely to be led by employer. The difference in origin may affect the labor-management communication differently, as we already indicated in discussions in this article. As suggested in the introduction of this article, the in-house training is the result of joint decision making between workers and employers. The consistency or the inconsistency between employers and employees is one of the most important aspects of training.

Appendix A: Institutional Arrangements and Interests in Training

PANEL A

dependent variable	chose training as the topic of labor-management communication *manager's* evaluation mean = 0.088 s.d.= 0.120											
	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value
Union	-0.044	0.008	0.00	-0.050	0.009	0.00	-0.043	0.008	0.00	-0.049	0.009	0.00
Joint Labor-Management Committee	0.012	0.008	0.14	0.008	0.008	0.34	0.012	0.008	0.12	0.007	0.009	0.44
Shopfloor Committee	-0.003	0.004	0.49	-0.003	0.004	0.52	-0.002	0.004	0.56	-0.003	0.004	0.52
establishment control	NO			YES			NO			YES		
average individual attributes control	NO			NO			YES			YES		
# of observation	1620											
unit of observation	establishment											
R-sq	0.029			0.1186			0.0426			0.1317		

PANEL B

dependent variable	chose training as the topic of labor-management communication *wokers' average* evaluation mean = 0.053 s.d.= 0.058											
	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value
Union	-0.015	0.004	0.00	-0.013	0.004	0.00	-0.011	0.004	0.01	-0.012	0.004	0.01
Joint Labor-Management Committee	-0.004	0.004	0.30	-0.001	0.004	0.77	-0.004	0.004	0.35	-0.002	0.004	0.61
Shopfloor Committee	0.001	0.002	0.46	0.002	0.002	0.47	0.001	0.002	0.54	0.001	0.002	0.50
establishment control	NO			YES			NO			YES		
average individual attributes control	NO			NO			YES			YES		
# of observation	1620											
unit of observation	establishment											
R-sq	0.0234			0.1152			0.0371			0.1215		

PANEL C

dependent variable	chose training as the topic of labor-management communication *manager's* evaluation - *workers' average* evaluation mean = 0.034 s.d.= 0.129											
	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value	coeff.	s.e.	p-value
Union	-0.029	0.008	0.00	-0.038	0.010	0.00	-0.032	0.009	0.00	-0.038	0.010	0.00
Joint Labor-Management Committee	0.015	0.008	0.07	0.009	0.009	0.32	0.016	0.009	0.06	0.009	0.009	0.35
Shopfloor Committee	-0.004	0.005	0.34	-0.004	0.005	0.36	-0.004	0.005	0.42	-0.004	0.005	0.37
establishment control	NO			YES			NO			YES		
average individual attributes control	NO			NO			YES			YES		
# of observation	1620											
unit of observation	establishment											
R-sq	0.0127			0.0995			0.0212			0.1094		

Source) See the footnote of Table 2.

Appendix B: Summary Statistics for Regression in Table 3 and Table 4
(# of observation is 79)

	mean	s.d.	min.	max.
implementation of off-the-job training	0.861		0	1
implementation of on-the-job training	0.797		0	1
manager's evaluation	0.418		0	1
mean of workers' evaluation	0.042	0.049	0.000	0.231
difference	0.376	0.495	-0.231	1.000
absolute difference	0.421	0.457	0.000	1.000
Union	0.646		0	1
Joint Labor-Management Committee	0.722		0	1
Shopfloor Committee	0.734		0	1

Source) SLmC 2009, 2014 and SHRD 2010, 2015. Unweighted estimation by authors. The summary statistics and estimated results for other control variables is not shown due to the space constraint, but available upon request.

Appendix C: Summary Statistics for Regressions in Table 5
(# of observation is 530)

	mean	s.d.	min.	max.
manager's evaluation	0.087		0	1
mean of workers' evaluation	0.043	0.045	0.000	0.267
raw mean of bonus ratio	0.194	0.080	0.000	0.375
wage-ternue profie : 5-14 yrs	0.166	0.229	-0.821	0.739
: 14-24 yrs	0.224	0.229	-0.651	1.571
: over 24 yrs	0.153	0.276	-1.571	1.048
Union	0.649		0	1
Joint Labor-Management Committee	0.623		0	1
Shopfloor Committee	0.566		0	1

Source) SLmC 2004, 2009, 2014 and BSWS 2004, 2009, 2014. Unweighted estimation by authors. The summary statistics and estimated results for other control variables is not shown due to the space constraint, but available upon request.

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