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ABSTRACT

Complementarity in Employee Participation Systems: International Evidence

We describe the nature, scope and effects of various non-mandated participatory work practices in Japan, the U.S. and Europe through the lens of complementarity in organizations. Specifically, rather than treating each work practice in isolation, we consider it an element of HIWS (High Involvement Work System), an employment system comprised of clusters of complementary work practices. In so doing, we present a coherent and complete picture of non-mandatory participatory work practices. Furthermore, by applying the common framework of viewing participatory work practices as complementary elements of HIWS to seemingly disparate forms of work practices in different parts of the world, we shed light on how participatory work practices play out in diverse institutional, cultural and regulatory environments.

JEL Classification: M5, J5

Keywords: High Involvement Work System, High Performance Work System, employee participation

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I. Introduction

In this paper we describe the nature, scope and effects of various non-mandated participatory work practices in Japan, the U.S. and EU nations through the lens of complementarity in organizations (Brynjolfsson and Milgrom, 2013). Specifically, instead of considering each work practice in isolation, we treat it as an element of HIWS (High Involvement Work System), an employment system consisting of clusters of such practices which complement each other.[1] Complementarity among various work practices is at the core of the literature on work practices, and discussing each practice in isolation and ignoring that it is a an element of HIWS will prevent us from developing a rich and full understanding of such practices and their effects. In addition, the use of HIWS as a common framework to describe seemingly disparate forms of participatory work practices in different parts of the world will provide insights on how participatory work practices play out in different institutional, cultural and regulatory environments.

In essence, HIWS is aimed at tapping into the ability of frontline workers (who produce goods and services directly) to engage in collective problem solving (including process and product innovation and responses to shocks), and contribute to the firm's productivity gains and quality improvement, and ultimately its competitiveness in the market (see, for instance, Kochan and Osterman, 1994, Appelbaum, et. al. 2000, Kato and Morishima, 2004, Boning, Ichniowski and Shaw, 2007).[2] It emerged and diffused as an alternative to a more hierarchical traditional employment system in which such problem solving activities are primarily performed by

[1] In the literature, HIWS is also referred to as HPWS (High Performance Work System).

[2] In addition, the literature sometimes stresses a synergy between the use of information and communication technologies and HIWS (see, for instance, Black and Lynch, 2004).

professionals and managers, and frontline workers are not expected (even discouraged) to do so (Kato, 2014).

HIWS is comprised of the three pillars, Opportunities, Incentives, and Ability/Skill. First, the firm with HIWS provides its frontline workers with formal and informal mechanisms through which they engage in the aforementioned problem solving collectively, and come up with solutions. Some of those solutions are local in nature, and implemented immediately without involving higher-level management. The other require firm-wide responses, and are shared with high-level management (can be incorporated into the firm's business strategy).

Some mechanisms are set up at the shop floor level, involving all workers in the same regular production team and problem solving activities often taking place as a part of their regular work. When those production teams are granted autonomy from their supervisors, they become self-directed teams, adjusting their work process, responding to local shocks, and solving various workplace problems collectively autonomously.

Others are set up at the top level, often taking the form of a standing "consultation" committee consisting of top management and labor representatives that meets regularly, engages in information sharing, and at times even decides jointly on a certain issues. Finally, some are set up as a cross-departmental, cross-functional project team, involving representatives from different departments (Kato and Owan, 2011).

Second, even if frontline workers are given an opportunity to engage in collective problem solving and contribute to productivity growth and quality improvement, they may not take advantage of such an opportunity and engage in problem solving wholeheartedly unless the interest of frontline workers is aligned with that of the firm. As such, HIWS needs some channels through which the interest alignment is facilitated. It is financial participation schemes (such as

employee stock ownership, profit sharing, gainsharing, and broad-based stock option) that serves as a main device to tie the financial wellbeing of frontline workers to that of the firm.[3]

Third, suppose that frontline workers are provided with the opportunity and have the appropriate incentive to engage in it wholeheartedly. However, unless such frontline workers possess appropriate problem solving ability and skill, no meaningful productivity gain and quality improvement will result. As such, careful screening and recruitment to ensure that the "right kind of workers" with the aforementioned ability and skill set are hired are an integral part of HIWS and once hired, front-line workers often go through extensive training (both off-the-job and on-the-job).

An HIWS emerged first in Japan in the 1960s and diffused widely among Japanese firms in the late 1960s and the 1970s. Many firms in the West (in particular U.S. manufacturing firms) started to experiment with a similar system as part of their effort to match the Japanese challenge in the global market (see, for instance, Kato and Morishima, 2002 and Ichniowski and Shaw, 2003, Doeringer, Lorenz and Terkla, 2003).[4] In the next section, we describe Japanese HIWS and present new evidence on recent changes (or lack thereof) in its incidence and nature, followed by a review of the empirical literature on the effects of Japanese HIWS. In Section III, we turn to the global diffusion of HIWS by focusing on HIWS in the U.S. and Europe, followed by concluding remarks in Section IV.

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[3] Somewhat ironically job security can generate an incentive for frontline workers to participate in such problem solving activities wholeheartedly. Suppose a team of frontline workers discover a valuable idea to enhance their workplace productivity through their group problem solving activities, and that the idea is likely to result in labor-saving technological change. Unless some degree of job security is credibly assured (e.g., no layoff pledge as an explicit practice or long-term employment as an implicit contract), the team of frontline workers will have an incentive not to reveal such efficiency-enhancing local information. For the importance of job security in new participatory employment systems, see for example Levine (1995) and Carmichael and MacLeod (1993).

[4] For more detailed analysis of the rise of Japanese management practices, see Koike, 2005, Aoki, 2000, Itoh, 1994, Morita, 2001; 2005, Moriguchi and Ono, 2004 and Rebick, 2005).

II. Japanese Firms as Early Adopters of HIWS

At the core of the Japanese HIWS are JLMCs, Joint Labor Management Committees (see for example Shimada, 1992; and Inagami, 1988). JLMCs are similar to works council in Europe and Korea with one exception---Japanese JLMCs are entirely voluntary. JLMCs are established at the corporate level, involving top management and labor representatives although large multi-establishment firms may also form establishment-level JLMCs. As such, JLMCs are the primary vehicle for the Opportunity Pillar at the top level in Japanese HIWS.

A closer look at the institutional details on JLMCs and extensive case studies of a dozen of JLMCs reveal that JLMCs are less likely to be a management ploy and more likely to be a legitimate mechanism of employee voice (Kato, 2003 and Kato, 2014). For instance, labor representatives are almost always union representatives for unionized firms. For firms without union the majority of labor representatives are elected by employees. Formal JLMC meetings are held typically once a month although informal preliminary meetings tend to be held more frequently. While there is some modest degree of heterogeneity among Japanese firms in the precise meaning of labor-management "consultation," typically through JLMCs labor representatives receive detailed and often confidential information on business strategies and plans from management and ask for substantive justifications for them. Yet they do not insist on joint decision making. However, when such strategies and plans are actually implemented, JLMCs will often function as a joint decision making body. For instance, it is ultimately management's decision to close a specific plant. Through JLMCs, management's plant closure decision is shared with labor representatives prior to its public announcement. As such, labor

representatives receive confidential information from management via JLMCs. Labor representatives then demand that management provides compelling reasons for the plant closure, and management typically provide substantive responses. There are typically multiple rounds of exchanges between the two parties. Throughout the process, both parties are aware that it is ultimately management's decision to close the plant. However, when the plant closure is being implemented, the detailed implementation plans (e.g., the timing of the plant closure, and transfer of workers to different plants) are often jointly determined between labor and management through JLMCs (Kato, 2006 and 2014).

There are two primary sources of quantitative data on JLMCs in Japan. First, there is a panel dataset for large publicly traded firms in Japan collected by Kato and Morishima (2003). The dataset reveals that in 1950 only about 20 percent (30 percent for manufacturing) of publicly traded firms in Japan had JLMCs, followed by an impressive diffusion of the institution among publicly-traded firms over the ensuing two decades. Thus, by 1970 sixty percent (seventy percent for manufacturing) of Japan's publicly-traded firms had introduced JLMCs. The next two decades were characterized by the continued and steady diffusion of JLMCs, and in 1992 fully 80 percent of all publicly-traded firms (nearly 90 percent for manufacturing) reported to have standing JLMCs in 1992 (Kato, 2014).

The second source of data is the Survey on Labor-Management Communications (SLMC) conducted by the Ministry of Health, Labor and Welfare every five years. Unlike the panel data collected by Kato and Morishima (2003), the SLMC provides only repeated cross-section data. However, the sample universe of the SLMC is all establishments with more than 30 workers, and includes many small to medium-size firms that are not included in Kato and Morishima's data. Furthermore, data on JLMCs for more recent years are available from the

SLMC. Note that the SLMC has been enjoying an unusually high response rate (around 70 percent), making the SLMC data less subject to non-response bias, and more representative.

Using published tables from the SLMC in 1999, 2004, 2009, 2014, and 2019, we produced Figure 1. The incidence of JLMCs (percent establishments with JLMCs) has been remarkably stable over the last two decades at around 40 percent for all establishments; close to 80 percent for establishments of large firms with 5,000 or more employees; and above 80 percent for establishments with union. The displayed stability is indeed extraordinary, considering the turbulence of Japan's economy over the last two decades from the latter and worse half of Japan's lost decade to the modest yet steady recovery to the global Great Recession. It certainly casts doubt on the validity of a popular rhetoric that Japan's once celebrated participatory employment system (which is the original HIWS) stopped working and has been abandoned by many Japanese firms in recent years (Kambayashi and Kato, 2017).

A closer look at Figure 1, however, reveals the falling incidence of JLMCs among establishments of smaller firms. For instance, for establishments of medium-size firms with 300-999, 60 percent of establishments had standing JLMCs at the beginning of the second half of Japan's Lost Decade, and by 2019, only 40 percent of establishments had standing JLMCs. In sum, over the past two decades of economic turbulence, the overall incidence of JLMCs among Japanese firms has been surprisingly stable although for smaller firms there is some evidence pointing to falling prevalence of JLMCs.[5]

It is, however, still possible that Japanese firms might have been weakening their use of JLMCs on the intensive margin, rather than on the extensive margin. Fortunately the SLMC provides information on the attributes of JLMCs which sheds light on changes in the use of

[5] The overall resilience of Japanese employment practices does not appear to be limited to JLMCs. Kambayashi and Kato (2017) find similar evidence for the practice of long-term employment in Japan.

JLMCs on the intensive margin. Traditionally JLMC meetings are held regularly---typically once a month (Kato, 2003). A simple way to terminate JLMCs *de facto* rather than *de jure* is to change their regular meetings to ad hoc meetings (meet only if necessary). As discussed in Kato (2003), Japanese firms tend to prefer terminating their existing programs informally rather than formally. To this end, we calculate the proportion of establishments holding JLMC meetings only if necessary for 1999-2019. Figure 2 shows the proportion of establishments with JLMCs holding their meetings only if necessary. Overall, close to 40 percent of establishments held JLMC meetings only if necessary in 1999 (in the midst of the second and worse half of Japan's Lost Decade). By 2004 (at the beginning of Japan's modest yet steady recovery from her Lost Decade), the figure fell by six percentage points, and then fell further to below 30 percent in 2014 and 2019. As such, we failed to find evidence for the weakening of JLMCs on the intensive margin over the last two decades. Disaggregating by firm size and union status confirms that we still fail to find any evidence for the weakening of JLMCs on the intensive margin for establishments of firms with differing firm size and union status. Note that the proportion of establishments holding regular JLMC meetings is substantially higher for larger firms (close to 90 percent for establishments of firms with 5,000 or more employees in 2019) and unionized firms (80 percent for establishments of unionized firms).

The SLMC also includes several questions on the outcomes of JLMCs assessed by each establishment with JLMC. Figure 3 shows the proportion of establishments with JLMC which consider their JLMCs yielding positive outcomes. Again, the proportion of all establishments with JLMCs which consider their JLMCs yielding positive outcomes has been stable around at 60 percent over the last two decades. Disaggregating by firm size and union status does not reveal any significant sign of worsening outcome assessment of JLMCs. Note that

establishments with unions are more sanguine about their outcome assessment of their JLMCs, which is consistent with a complementary relationship between JLMCs and unions (Kato, 2006).

In addition to JLMCs, Japanese firms use two employment practices for the Opportunity Pillar at the grassroots level, Shop-Floor Committees (SFCs) and Small Group Activities (SGAs). In SFCs supervisors and employees on shop floor discuss issues such as shop-floor operations and shop-floor environments. As in the case of JLMCs, there are two main sources of data on SFCs in Japan. According to Kato and Morishima (2002)'s data on publicly-traded firms, on average SFC meetings are held about nine times a year (slightly less frequently than JLMCs); and that information shared through SFCs often goes beyond standard shop-floor issues such as safety and health, fringe benefits, training and development, and grievances, and includes business strategies and goals/plans. As such, what is shared and discussed through JLMCs are disseminated to frontline workers via SFCs. In 1960, a little over 10 percent of all publicly-traded firms including both manufacturing and non-manufacturing firms (15 percent for manufacturing) used SFCs, followed by a steady diffusion over the next three decades and by 1992, the proportion of publicly-traded firms with SFCs reached 40 percent (45 percent for manufacturing firms).

Again, more recent data on the incidence of SFCs are available from the SLMC for all firms including both publicly-traded and private firms (note that a unit of observation is an establishment of such firms). Figure 4 shows the proportion of establishments with SFCs in Japan. Overall, the proportion of establishments with SFCs has been extraordinarily stable at around 60 percent over the last two decades. Even when we disaggregate by firm size and union status, we continue to find no evidence for the falling incidence of SFCs, pointing to the

resilience of Japan's HIWS. Unfortunately unlike data on JLMCs, the SLMC provides no consistent information on changes (or lack thereof) in the use of SFCs on the intensive margin.

Small Group Activities (SGAs) are activities such as kaizen, JK (Jishu Kanri which means self-management), QC circles, Zero Defects in which small groups consisting of frontline workers set plans and goals concerning operations, and work together toward accomplishing these plans and goals without direct supervision. Some SGAs such as QC circles are meant to be voluntary and take place after regular hours yet the other involve all frontline workers in the same workplace and take place during regular hours. The degree of supervisor involvement can vary from regular presence of a supervisor to no supervisor presence. Some can be *ad hoc* task forces or project teams involving workers from different departments and the other involve all frontline workers in the same workplace (Kato and Owan, 2011)

Japanese SGAs have been touted as the hallmark of "Japanese Management," and have made Japanese firms (in particular large manufacturing firms) the target of benchmarking by many firms in the West (see, for instance, Cole, 1989). In 1950 almost no firm (only 3 percent) used an SGA. In 1960 only 6 percent of publicly traded firms had an SGA. The rapid diffusion of the institution began in 1960s. By the beginning of 1970s, about one in four publicly traded firms were practicing an SGA, and the figure reached 44 percent in 1980. Since then the institution has grown steadily; in 1993 70 percent of publicly traded firms reported practicing an SGA. SGAs are clearly more popular among larger firms (80 percent of firms with 5,000 or more employees practice an SGA as opposed to 43 percent of firms with 299 or fewer). Moreover, SGAs are more wide-spread in the unionized sector (Kato, 1995). Unfortunately unlike JLMCs and SFCs, there is no reliable data which allow us to trace changes in the use of SGAs by establishments of Japanese firms for more recent years.

Incentives and Ability/Skill in Japanese HIWS

Before introducing research findings on the effects of JLMCs, SFCs, and SGAs, let us briefly discuss the other two Pillars of Japanese HIWS. After all, organizational complementarity theory urges us to examine the effects of JLMCs, SFCs, and SGAs in tandem with the other two Pillars of Japanese HIWS.

At the core of the Incentive Pillar of Japanese HIWS are two financial participation schemes, Japanese Employee Stock Ownership (JESO) and Group Incentive Pay (GIP). JESO is a hybrid between ESOP and ESPP (Employee Stock Purchase Plan) in the U.S. JESO's collective ownership and voting at the general meeting of shareholders, along with restrictions on short-term repeated trading, make JESO distinct from ESPP and similar to ESOP in the U.S. However, the voluntary participation of employees and direct contributions to JESO plans by employee participants make JESO differ from ESOP, and share commonality with ESPP (Kato, Miyajima, and Owan, 2019).

JESO diffused rapidly among Japanese firms during Japan's high growth era and managed to weather her Lost Decade in the 1990s and early 2000s (Kato, 2003). According to Kato, Miyajima and Owan (2019), the proportion of firms listed on Tokyo Stock Exchange (TSE) that use JESO has been around 90 percent without much fluctuation over the last decade. The proportion of the labor force in TSE-listed firms with JESO plans who participate in the plans rose from below 50 percent in early 1990s to over 60% in mid-2000, and dropped again to near 50 percent after the financial crisis of 2008. In 2009, the average participant owns stock worth close to 1.5 million yen that constitutes close to 40% of the value of total financial asset holdings of the average employee household. For the average employee participant, JESO

represents a high stake investment. In contrast, JESO does not own large percentages of company stock. For TSE-listed companies the proportion of stock owned by JESO has been growing recently yet it is still around 2 percent. In sum, JESO is deep-rooted and wide-spread among publicly-traded firms in Japan, with broad participation (up to 50 percent of employees participating) and considerable stake (up to 40 percent of his/her total asset holdings).

GIP is a group-based pay for performance plan in which individual worker's pay is linked to a measure of performance of a group to which he/she belongs, such as profit sharing, gainsharing, and various team-based compensation schemes. General Survey on Working Conditions (GSWC) conducted annually by the Ministry of Health, Labor and Welfare includes questions on GIP periodically (for the most recent decade, questions on GIP were included in GSWC in 2009, 2012, and 2017). The sample universe of GSWC is all firms (including both publicly-traded and private firms) with 30 or more employees, and like the aforementioned Survey on Labor-Management Communication, GSWC has been enjoying impressive response rates (over 60 percent).[6]

Figures 5 and 6 show the proportion of Japanese firms using performance pay (defined as firms using performance as a determinant of base pay) in 2009, 2012, and 2017 for managers and non-managers respectively. For both managers and non-managers, overall, the incidence of performance pay has been falling from around 45 percent in 2009 to around 40 percent in 2017. When disaggregated by firm size, the incidence of performance pay is found to be greater for larger firms. Performance pay can be Individual Incentive Pay (IIP) linking pay to individual performance as well as GIP. Both figures also show the proportion of firms with IIP and GIP.

[6] For a detailed analysis of profit sharing, a well-known example of GIP in Japan, see Kato and Morishima (2003).

For managers, roughly a half of performance pay is GIP, while for non-managerial employees, less than 20 percent of performance pay is GIP.[7]

Regarding the Ability/Skill Pillar, Japanese firms use extensive job rotation not only for white-collar workers but also for blue-collar workers (see, for example, Koike, 2005; Kato, 1986; Carmichael and MacLeod, 1993; Morita, 2005). In addition, Japanese firms are likely to invest more on recruitment and training of workers than in the U.S. (see, for example, Mincer and Higuchi, 1988, and Brunello and Medio, 2001).

Effects of Japanese HIWS

There are a number of rigorous estimates on the effects of specific elements of the Japanese HIWS. For JLMCs, Morishima (1991a, 1991b) provides the first systematic evidence on the positive effects of JLMC on firm performance and collective bargaining. A later study by Kato (2006) finds that it is the wide dissemination of information shared during JLMC meetings to the rank and file that matters. For JESO, Jones and Kato (1995) use panel data on the use of JESO by publicly-traded firms in Japan and find fixed-effect estimates pointing to a 4 to 5 percent productivity gain from the introduction of JESO with several years of lag.

Kato and Morishima (2002) provide the only systematic evidence on the effect of Japanese HIWS (as opposed to its specific elements) by combining their extensive longitudinal field research at a variety of Japanese firms since 1980s with their own survey of Japanese firms (HRM Survey of Japanese Firms). They consider JLMCs (the opportunity pillar at the top) and

[7] It is, however, possible that some firms without using performance as a determinant of base pay may still use performance as a determinant of their bonus payments. The 2017 GSWC includes a few questions on the bonus payment system. While over 90 percent of Japanese firms used the bonus payment system in 2017, it turns out that only about 20 percent of them used group performance as a determinant of their bonuses.

SFCs (the opportunity pillar at the grassroots) as well as JESO (the incentive pillar), and estimate fixed effect models of a production function augmented by Japanese HIWS. They find that switching its employment system from a traditional system with no element of Japanese HIWS to its full system with JLMC, SFC, and JESO will result in an 8 to 9-percent gain in productivity. Importantly such a productivity gain from the introduction of Japanese HIWS will be felt only after a long gestation period. The substantially-lagged productivity effect of Japanese HIWS is not too surprising for the following three reasons. First, it is implausible that a newly-introduced HIWS will produce a strong goal alignment between the firm and frontline workers overnight. It is likely to be a slow process. Second, frontline workers will need to learn to be effective grassroots innovators and problem solvers, which will take time. Third, as shown by Kato (2006), a newly-introduced HIWS tends to go through organizational learning, keep fine-tuning various attributes of the system, and improve its effectiveness over time.

Kato and Morishima (2002) further provide evidence for strong organizational complementarity. As discussed above, when the traditional employment system with no element of Japanese HIWS is switched to a full system of HIWS with JLMC, SFC, and JESO, there will be a significant 8 to 9 percent productivity improvement. However, such a significant productivity improvement will not result if the switch of the employment system from the traditional one to Japanese HIWS is incomplete---introducing JLMC, SFC, or JESO alone will yield no significant productivity gain; even if introducing two of them, still no significant productivity gain will arise.

Research on the effect of Japanese HIWS on worker outcomes is limited. Bae, et al. (2011) collected unique data from Japanese and Korean workers in the electrical, electronic, and information industries by conducting the Worker Representation and Participation Survey

(WRPS) in both countries (the WRPS was originally conducted in the U.S. by Freeman and Rogers, 1999). They find that in both countries employees in firms with HIWS are more likely to have stronger senses of influence and voice on decision making in the workplace than comparable workers in firms without HIWS.

III. The Global Diffusion of HIWS

III-1 U.S. firms responding to the "Japanese manufacturing challenge"

The rise of the Japanese firms in the global marketplace and Japanese HIWS that was considered in part responsible for the "Japanese manufacturing challenge" have had a far-reaching impact on U.S. firms. We conducted field research at several mid-size manufacturing firms in rural communities of central New York as part of the Russell Sage Foundation and Racefellow Foundation Project (Jones and Kato, 2011). None of those firms in rural America had any tie to Japanese firms yet a word "kaizen" was used commonly by our informants (HR directors and plant managers) and at one of these firms, a factory was filled with kaizen posters.

The diffusion of the Opportunity Pillar (mostly at the grassroots) among U.S. firms has been impressive. Osterman (1994), based on his own well-designed survey of U.S. establishments with 50 or more employees, reports statistics showing a rather remarkable diffusion of self-directed teams and problem solving teams (similar to Japanese SGAs involving frontline workers in the same workplace with little supervision) among U.S. establishments. In over 40 percent of U.S. establishments (32 percent in manufacturing) in 1992, the majority of their front-line workers were working in such self-directed teams. Close to 30 percent of establishments (no significant difference between manufacturing and non-manufacturing here) involved their frontline workers into QC circles. Using reliable data from a U.S. Bureau of

Census survey of all U.S. establishments with 20 or more employees conducted in 1993 and 1996, Cappelli and Neumark (2001) and Black and Lynch (2001, 2004) report that the average U.S. establishment has approximately 12 percent of their non-managerial workers involved in self-directed teams in 1993. The participation rate rose to 17 percent in 1996. In addition, over 40 percent of establishments reported to use TQM (total quality management), a similar practice to QC circles with more management involvement in 1993.[8]

The firm-level incidence rates of elements of HIWS in the U.S. are also available for large firms although they are more likely to be subject to non-response bias due to lower response rates. It is plausible that firms without HIWS are less likely to respond to a survey on HIWS. As such, the observed incidence rates may be biased upward. This caveat aside, as reported in Lazear and Shaw (2007), the proportion of large U.S. firms using self-directed teams was only 27 percent in late 1980's. Over the following decade, the incidence rate almost tripled.

Turning to the Opportunity Pillar at the top, U.S. firms rely on regularly scheduled employee meetings where top management provides employees with information. Unlike Japanese JLMCs that sometimes go beyond mere information sharing and involve joint-determination on important management decision-making, however, these meetings rarely go beyond information sharing. Using the aforementioned data from U.S. Bureau of Census, Cappelli and Neumark (2001) and Black and Lynch (2001, 2004) report that the average U.S. establishment had about 40 percent of its non-managerial workers involved in such meetings in 1993, and three years later in 1996, the number was higher (close to 50 percent). Kato (2014), based on his extensive field research at U.S. and Japanese firms, reports that information shared during such meetings in the U.S. tends to be less extensive and substantive than what is shared

[8] However, some researchers have argued that TQM may actually be "a modern repackaging of Taylorism" (Dean and Bowen, 1994).

during Japanese JLMC meetings, and that certainly "insider trading" information (which is sometimes shared via JLMC in Japan) is almost never shared during such meetings in the U.S.

Incentives and Ability/Skill in U.S. HWIS

U.S. firms have been actively experimenting with financial participation schemes. In 2002, 34 percent of U.S. workers in the private sector were eligible for PSPs; 23 percent eligible for gainsharing; 21 percent owning company stock; and 13 percent holding stock option (Blasi, Freeman, and Kruse, 2004). Cappelli and Neumark (2001) and Black and Lynch (2001, 2004), using the aforementioned data from U.S. Bureau of Census, find similar penetration rates of financial participation schemes among U.S. establishments.

Turning to The Ability/Skill Pillar, U.S. firms traditionally invest less in non-managerial workers than Japanese firms (Brunello, 2001). With the growing popularity of problem solving teams and self-directed teams, U.S. firms have started to give more attention and resources to training including both on and off the job for frontline workers.

Again, according to Cappelli and Neumark (2001) and Black and Lynch (2001, 2004), on average about 17 percent of non-supervisory employees got involved in job rotation in 1993 and 26 percent in 1996. For training especially related to team activities, more than one in two establishments offered teamwork training or problem solving training in 1993 and likewise that close to 70 percent offered cross-training in the same year.

Effect of U.S. HIWS

As we discussed earlier, many adoptions of U.S. HIWS have been in part in response to the rise of Japanese firms in the global marketplace and Japanese HIWS as an allegedly secret of their emergence. Yet somewhat ironically there are actually considerably more studies on the

productivity effect of U.S. HIWS than that of Japanese HIWS. There are three complementary types of studies. First, studies using national surveys of firms or establishments encompassing diverse industries (for firm-level outcomes, see for instance Appelbaum and Batt, 1994; Freeman, Kleiner and Ostroff, 2000; and for establishment-level outcomes, see for example Black and Lynch, 2001 and 2002 and Cappelli and Neumark 2001). While such studies are very valuable due to their external validity, potentially national cross-industry studies have significant limitations including measurement issues, endogeneity, and omitted variables (Bartel, Ichniowski and Shaw, 2004).

One important response to these difficulties of national cross-industry studies has been "insider econometric studies" in which researchers conduct detailed qualitative field research at establishments within a narrowly defined industry and develop detailed understanding of the actual production process and the use of HIWS. Researchers then obtain access to unique internal and confidential data at the level of establishments or branches (e.g., physical productivity, rejection rate and downtime at the establishment-level) and estimate the impact on establishment performance of HIWSs.[9] Ichniowski, Shaw, and Prennusi (1997) provide one of the first and most compelling insider econometrics studies. Using insights from their extensive field research at 45 steel finishing lines, they set up an institutionally-informed empirical strategy; collect accurate monthly productivity data along with rich data on the use of HIWS by each line; estimate the productivity effect of the introduction of HIWS; and provide institutionally-informed interpretations of their estimates. As in the case of Kato and Morishima (2002)'s estimates on the productivity effect of Japanese HIWS, they find evidence on

[9] See also MacDuffie (1995), Dunlop and Weil (1996), Kelley (1996), Huselid and Becker (1996), Helper (1998), Bartel (2004), and Appelbaum et al. (2000). Ichniowski, et al. (1996) provide a succinct discussion on the key methodological issues encountered by empirical studies.

statistically significant and economically meaningful productivity gains from a switch from a very limited set of elements of HIWS to a complete set of elements of HIWS. Furthermore they find significant complementarity among elements of HIWS.

Another important development is empirical work by economists that uses *data on individual workers* employed by a *single firm* (e.g. Hamilton, Nickerson and Owan, 2003; Lazear, 2000; Jones and Kato, 2011).[10] These "econometric case studies" enable researchers to incorporate more detailed information on key features of the organization of production and most importantly individual worker's responses to HIWS. Thus they go deep within the "black-box" of the firm and allow for more precise estimates of the effects of HIWS on firms and the channels through which these practices operate. However, since such data are notoriously difficult to obtain there have only been a handful of such econometric case studies, none of which has been able to examine a comprehensive set of elements of HIWS.

There is also a smaller yet important body of research on the effect of U.S. HIWS on worker outcomes. Overall, evidence is more mixed than the one on the productivity effect of HIWS. Most studies focus on the effect of HIWS on wages, and report that the wage premium associated with HIWS are either zero or quite modest (Handel and Levine, 2004). Evidence on the association between U.S. HIWS and job stability is also quite mixed (Cappelli and Neumark, 2004, Black, Lynch, and Krivelyova, 2004, Osterman, 2000). Turning to more subjective worker outcomes, prior studies tend to agree that employees in the workplace with HIWS are more satisfied than their counterparts in the workplace without HIWS (Freeman and Rogers, 1999, Appelbaum, et al., 2000, Hunter, MacDuffie, and Doucet, 2002). Batt (2004) report an intriguing

[10] Pioneering works using internal personnel data in economic research include Medoff and Abraham (1980), and Baker, Gibbs, and Holmstrom (1994a, 1994b).

asymmetry between frontline workers and their supervisors---self-directed teams (a key element of U.S. HIWS) are associated with higher job satisfaction for frontline workers yet lower job satisfaction for supervisors).

III-2. HIWS in European Firms

Studies on HIWS in Europe appear to be less common and more recent compared to US and Asia. The European case is of special interest given the many ways in which the institutional environment differs from other regions. First, many European countries are characterized by relatively strict job protection regulations that may constrain the ability of firms to change the size and composition of the workforce (OECD, 2020). Second, collective wage bargaining is still widespread and relatively centralized compared to other regions (Visser, 2016). Finally, mandated systems of employee representation and codetermination both at the shop-floor and board-level are in place in most countries (Forth et al, 2017; Gold and Waddington, 2018; Jäger, Noy and Schoefer, 2021). These preliminary considerations are important considering that the outcomes of HIWS may depend on features of the general institutional environment in which firm practices are embedded.[11]

Despite sharing some common features, European countries also exhibit marked institutional differences. For this reason, we survey studies covering a broad range of countries and industrial relations regimes (Visser, 2009): Finland (North), UK (West), Italy and France (South), Germany (Centre-West). In terms of our organizing framework, we review studies

[11] Godard (2004) points out that the outcome of high-performance work systems may be contingent on whether managers adopt an intensification (oriented toward cost reduction) or an involvement approach (oriented toward high employee commitment), which in turn may be affected by general features of the institutional context (e.g. coordinated vs. liberal market economies).

documenting effects of HIWS on both employee and firm-level outcomes and addressing complementarities between pillars.

Using microdata from the last three waves of the European Company Survey (ECS 2009, 2013, 2019), we look at the incidence and evolution of participatory employment practices in Europe. ECS data cover a representative sample of non-agricultural establishments in 28 EU countries employing at least 10 workers. A crucial advantage of this survey is that it provides harmonized cross-country information of workplace characteristics and organizational practices. It is important to interpret trends cautiously as they may partly reflected ECS sample composition changes.

We consider three distinct workplaces practices typically associated with HIWS. First, we look at the share of establishments using self-directed teams, i.e. production teams in which members enjoyed substantial task autonomy. Second, we consider the share of establishments using information sharing practices. These include (a) regular staff meetings open to all employees, (b) discussion with employees through social media or in online discussion boards, (c) information through newsletters, website, notice boards or email. We look at both workplaces using at least one information-sharing channel and those relying on the three channels simultaneously. Finally, we consider the use of suggestion schemes (i.e. physical or virtual 'suggestion box' protocols) as a tool for involving frontline employee.

According to ECS 2019, roughly 15% of EU workplaces rely on self-directed teams. In Figure 7, we plot the incidence of self-managed teams over the period 2009-2019. We provide disaggregated figures by establishment size, use of company or team-level profit sharing schemes, presence of shop-floor employee representation (unions, works councils, etc.) and collective bargaining coverage. Our figures indicate a slight decline in the utilization of self-

directed teams over the past decade. The use of teamwork appears to be slightly higher in small establishments and in those using profit sharing schemes, which is consistent with the idea that free riding may be less prevalent in small workplaces (Alchian and Demsetz, 1972). We do not observe differences in the utilization of teamwork between establishments with and without shop-floor employee representation or binding collective bargaining agreements.

In Figure 8, we report the incidence of information sharing. The utilization of information sharing practices in Europe is widespread. Roughly, 60% of establishments use at least one information-sharing channel. However, we observe a reduction in the share of establishments engaging in information sharing between 2013 and 2019. Few establishments (6%) develop high-intensity information sharing practices, relying on multiple channels simultaneously. Information sharing appears to be higher in large establishments, in establishments using profit-sharing schemes and in those with employee representation. Finally, roughly 37% of establishments use suggestion schemes to foster direct employee involvement. Figure 9 shows that the use of suggestion schemes is more frequent in large establishments. It is also slightly more common in workplaces with profit sharing and employee representation, which partly reflect the fact that these workplaces are larger on average.

Indeed, an interesting and relatively under-researched question in the European context concerns the interplay between workplace employee representation and other practices associated with HIWS. Employee representation may have crowding in or crowing out effects on other practices associated with HIWS, such as information sharing and direct forms employee involvement. It is worth noting that mandated forms of employee representation observed in Europe differ from largely voluntary Japanese employee representation bodies (JLMCs)

discussed in section III. In Europe, the law guarantees workers' right to information, consultation, and representation at the workplace level.

Using a cross-national data set, the State of the Workplace Employment Relations Survey (SWERS), Gomez et al. (2019) study the correlation between joint consultative committees (the UK-version of German works councils) and employee satisfaction. They restrict the analysis to the sample of British workers comprising roughly 2000 observations. More importantly, they look at the interplay between joint consultation systems and other high-involvement HRM practices. The presence of joint consultative committees is associated with higher self-reported employee well-being even after controlling for HRM practices and union presence. Interestingly, they find a positive and significant three-way interaction: the correlation between joint consultation systems on employee well-being is higher when other high-involvement HR policies and unions are present.[12]

Incentives and Ability/Skill in European HIWS

In the context of HIWS, variable pay schemes play a crucial role in aligning workers and firm objectives. Using data from the early 2000s, Bryson et al. (2012) report that the share of workers exposed to variable pay varies between 10-15% in Mediterranean (Greece, Portugal) and Anglo-Saxon (UK, Ireland) countries and 40% in Scandinavian countries (Sweden, Finland) and United States. According to Eurofound (2017), the incidence of individual performance-related pay and profit-sharing schemes among European workers reached 16% and 13% in 2015, respectively. The incidence of profit-sharing schemes among European workers has continuously

[12] Using a sample of more than 20000 private-sector workplaces in 32 countries from the European Company Survey 2013, Belloc et al. (2020) find that shop-floor employee representation is positively correlated with the utilization of information sharing channels, such as regular staff meetings, after controlling for a wide range of firm-level attributes.

increased since 2000. More recently, Eurofound and Cedefop (2020) provide estimates of the utilization of variable pay at the workplace level. Variable extra pay linked to the performance of the team, working group or department (group performance-related pay) is used in 40% of European workplaces, although only 14% of establishments apply variable pay broadly (i.e. covering at least 60% of the workforce). Roughly, one-fifth of workplaces use profit-sharing schemes (company performance-related pay) covering the majority of the workforce.

Another key pillar of HIWS ("ability") relates to training and skill development. As we argued in section II, workers may not be able to make productive use of local knowledge and greater information and discretion conferred in the context of HIWS if they lack the appropriate skills. Training is a widespread practice in Europe. According to Cedefop (2019), roughly 75% of firms provided some kind of continuous vocational training in 2015. The incidence of training is increasing in firm size and almost universal among large European firms in most countries. In relation to training intensity, the average time spent on training courses was 6.2 hours per 1000 hours worked. On average, total training expenditures made by European firms represent less than 1% of total labour costs.

Historically, the incidence of company-provided formal training has been higher in Europe than in the United States. This stylized fact has been attributed to differences in labor market institutions (Acemoglu and Pischke, 1999). Zwick (2006) studies the productivity effects of continuing employee training using longitudinal workplace data from Germany. He measures training intensity by the share of trained employees. He finds a positive effect of training on productivity, although the magnitude of the effect is larger once selection into training is account for. German establishments seem to react to expected skill shortages by intensifying workforce-training effort.

Again, it is relevant to analyze the interplay between EU's unique institutional set up of mandated workplace employee representation and pillars 2-3 of HIWS discussed in section II. Using German workplace data, Kraft and Lang (2013) shows that comprehensive profit-sharing schemes involving the majority of the workforce are positively associated with training intensity. The presence of works council is positively associated with the use of high-coverage profit sharing schemes. Heywood and Jirjahn (2014) also study the correlation between financial participation and (profit sharing and employee ownership) in the German context. They find a positive correlation between works councils and financial participation in domestic firms but not in foreign companies.

There are some studies documenting correlations between shop-floor employee representations and training provision at the workplace level. In the German context, where works councils have the legal right to participate in firm's training decisions, Kriechel et al. (2014) show that works council are associated with higher investment training and greater retention of apprentices. More recently, Koch et al. (2019) also show that the involvement of works councils is associated with higher output quality of apprenticeships. However, they do not find significant effects on other quality indicators of the training process. Using German establishment data, Heywood et al. (2020) find a positive association between works councils and training. Based on a large sample of EU workplaces, Belloc et al. (2020) document a positive and significant association between employee representation and workplace practices granting workers with paid time off for training. Using a novel mixed method approach that combines quantitative analysis and semi-structured interviews to key informants, Berton et al. (2019) study the effect of firm-level unionism on training in the Italian context. The econometric study shows a positive association between the presence of unions at the workplace level and

different measures of training quantity and quality. The qualitative analysis offers a more mixed picture of the role of unions in relation to skill formation. Informants (mainly union and employer representatives, and HR mangers) indicate that the initiative of unions in relation to training activities is rather limited. However, they also point out that training usually enters into the firm-union agenda after repeated bargaining rounds, suggesting the importance of dynamic learning and reputational effects.

Studies discussed above are largely correlational. Using matched employer-employee data from Portugal and regression discontinuity design, Martins (2019) find that more intense union representation increases firm performance. Identification rests on country-specific legal rules creating exogenous discontinuities in the number of union representatives depending on the number of union members at the workplace level. The key mechanism driving the results appears to be training provision. More precisely, the study finds that investments in training per worker increase significantly in firms mandated to have a high number of union representatives.

Effects of European HIWS

Researchers have studied the effects of European HIWS on firm performance.[13] Caroli and Van Reenen (2001) study the interplay between organizational changes aimed at introducing high-performance practices (multitasking, delegation of responsibility, delayering) and performance. Their framework highlights the complementarities between modern organizational practices and skilled labor. Using establishment-level data from France and the UK, they find that organizational changes are associated with a declining demand for unskilled labor and lead

[13] Addison (2004) provides a survey of studies on innovative work practices on firm performance, although restricted to the US and German contexts.

to larger productivity gains in workplaces endowed with higher levels of skills. The also find that a reduction in the relative cost of skills increases the likelihood of organizational changes. Zwick (2004) assesses the impact of shop-floor employee involvement on firm productivity. Using the German IAB establishment panel over the period 1996-2000, he finds that the introduction of employee involvement practices, such as teamwork, autonomous work groups or flat hierarchies, significantly increases establishment productivity. The effects holds even after accounting for the endogenous adoption of these practices. Importantly, he also finds positive complementarities between high-involvement practices and the presence of mandated forms of employee representation (works councils). Establishments with a works council derive larger productivity gains from introducing employee involvement systems. Although the underlying mechanisms are not explicitly investigated, the results of this study suggest that the collective voice effect of works councils offsets any potential negative effect related to decisional constraints imposed on managers.

Few studies analyze the correlation between HIWS and firm performance in the context of Southern European countries, characterized by stricter employment protection regimes and less cooperative labor-management relations. Based on a panel of 109 Italian manufacturing single-plant firms observed in the 1990s, Colombo et al (2007) study the effect of HIWS on profitability. They analyze a wide range of workplace practices, including profit sharing schemes, individual pay incentive plans, job rotation, formal team practices, and total quality management. They find a positive association between HIWS and profitability. Drawing on the notion of complementarity, they find that the effect of HIWS is contingent on organizational changes aimed at delegating decision authority (decentralization).

Finally, Ait Razouk (2011) analyzes the correlation between HIWS and performance of small and medium-sized enterprises in France. An index of HIWS is constructed by combining information on different workplace practices, such as performance appraisals, profit-sharing, information sharing, and quality groups. Using longitudinal data from 275 SMEs (Response survey), the author finds a positive association between a complementary bundle of HIWS practices and different performance indicators, such as profitability and innovation.

Insider Econometrics and Econometric case studies have also contributed to advance the understanding of the effects of HIWS in the European context.[14] This is particularly true when researchers have supplemented the use of high-frequency quantitative data with qualitative information characterizing the firm environment, the implementation process of HIWP, and institutional context.

Jones, Kalmi, and Kauhanen (2010a) conduct an econometric case study to analyze the effect of teamwork and group-based performance pay on productive efficiency in the context of a Finish food-processing plant. The study is based on weekly production records for four production lines over the period 1999-2005. High-frequency longitudinal data is supplemented with rich institutional knowledge thanks to extensive interviews conducted with managers and workers. Using structural break time-series techniques and in line with the theory of organizational complementarity, the authors find that the addition of group-based pay for performance to teamwork increases productivity by 9-20%.

In another interesting application of insider econometrics to the study of HIWS, Jones, Kalmi and Kauhanen (2010b) study the effect of HIWS on performance now in the context of a large retail firm with forty-seven establishments around Finland. They use value added as a

[14] One commonly discussed limitation of single-firm studies is their limited external validity.

measure of output and hours worked and floor space as main inputs. Based on survey data, they account for different dimensions of the HR environment, such as participation, information sharing, supervisor feedback, and performance appraisal (development talks). They estimate a series of augmented production function specifications. While the authors control for a rich set of factors, including manager and establishment fixed effects, they cannot fully rule out confounders related to the endogenous adoption of HIWS. The results suggest that productivity is enhanced in HIWS environments, where employees have opportunities to participate, share information and get feedback from their supervisors.

In the context of a fruit producer UK company, Bandiera Rasul, and Barankay (2013) conduct a field experiment to study the causal effect of incentive design on productivity in a team production environment. Workers are organized into teams and their main task is to pick fruit from fields at different locations. Workers are allocated to a team for their first week and then they are free to choose their own teammates. A crucial feature of this study is that researchers exogenously manipulate team incentives. At the start of the production season, teams were paid piece rates based on aggregate productivity. In the middle of the season, rank incentives were introduced by posting daily information on absolute performance of each team and their ranking relative to all other teams. Then, researchers added a tournament component to the compensation scheme, i.e. a monetary prize for the most productive team each week. The study shows that team composition changed after the introduction of rank incentives and tournaments relative to the baseline condition in which only piece rates are used. Providing additional incentives, via rankings or tournaments, makes workers more prone to form teams with coworkers of similar ability instead of with their friends. This is an important finding given the role played by social ties, via informal sanctions, social punishment and mutual monitoring,

in curbing free riding in teams (Kandel and Lazear, 1992; Carpenter, Bowles and Gintis, 2009). Interestingly, they show opposing productivity effects of rankings (negative) and tournament (positive): only the tournament is sufficiently high-powered to induce net productivity gains, offsetting losses due to the increase in free riding. While the setting is very specific, this study provides clean evidence on the relative importance of worker's effort and team composition in driving productivity effects, highlighting the interplay between incentive design and endogenous team formation.

There are not many studies analyzing the adoption and impact of HIWS in the context of alternative firm ownership structures. One exception is the research done by Arando et al (2015), which provides an econometric case study of efficiency for Eroski, the largest member of the Mondragon group of worker cooperatives. They compare the performance of cooperative stores, characterized by different degrees of employee ownership and voice, with conventional stores with no employee ownership. Using monthly store-level observations, they find that hypermarket stores with cooperative ownership exhibit significantly faster sales growth than conventional hypermarkets. Small cooperative supermarkets also outperform their conventional counterparts. The authors show that the effect is channeled by the more extensive reliance on HIWS in cooperatives (employee involvement, incentives and training). Using individual level data, the authors also find evidence of lower job satisfaction in cooperative stores compared to conventional stores. This suggests that the welfare consequences of cooperative ownership supplemented with HIWP are complex, highlighting potential side effects in terms of workers' stress levels and expectations.

Numerous studies have relied on survey data, sometimes linked to administrative records, to investigate the association between HIWS and a wide range of employee outcomes, such as

absenteeism, motivation, job satisfaction, and wages. Using a sample of German manufacturing plants, Heywood and Jirjahn (2004) show that firms with teams have lower absence rates. Teamwork is measured as the share of workers in teams. The underlying mechanism appears to be that firms relying on team production have greater incentives to engage in monitoring as absenteeism is more costly due to the interdependence in worker productivity. Heywood et al (2008) further investigate the effect of teamwork on absence behavior. They use richer information to characterize the nature of teamwork, such as whether team members actually work together and make joint decisions. Using cross-sectional data from UK workplaces[15], they show that team production is associated with a reduction in worker absences.

In the UK context, Bryson and White (2019) study the effect of HIWS on employee motivation in small firms. They measure the intensity of HIWS, combining information on employee participation, teams, skill development, recruitment, and incentives. Using matched employer-employee data from WERS 2004 and 2011, they show that returns to investments in HIWS, in terms of intrinsic job satisfaction and organizational commitment, are U-shaped. Some studies have analyzed the effects of HIWS in the context of Nordic countries, where innovative workplace practices are widely diffused. Using individual survey data linked to worker sickness absence history in Finland, Böckerman, Bryson and Ilmakunnas (2012) show that workers exposed to HIWS report higher subjective wellbeing, experience fewer accidents, but more short absence spells than similar employees not exposed to HIWS. They argue that higher short-run absenteeism in HIWS intensive workplaces can be explained by their flexibility to meet production schedules via work intensification and multitasking. In a related paper, Böckerman, Bryson and Ilmakunnas (2013) analyze the effect of HIWS on workers' pay in

[15] As many other studies on UK workplaces, the authors rely on the Workplace Employment Relationship Survey (WERS).

Finland. They rely on different measures of innovative workplace practices, including indicators for the utilization of self-managed teams, information sharing, performance appraisal, autonomy, among other practices. Using individual-level data from the Quality of Work Life Survey linked to administrative data on wages and work histories, they show a positive correlation between HIWS and wages. This is partly due to positive selection of high-ability workers into high-performance intensive jobs: past earnings and earnings growth are positively correlated with the probability of being employed in a HIWS job. Drawing on the notion of organizational complementarity, they also investigate the effect of different bundles of HIWS. They find that bundles of practices associated with the utilization of self-managed teams result in a higher wage premia than those based on job autonomy.

Using a representative sample of Finish workers, Kalmi and Kauhanen (2008) study the effect of various practices associated with high-performance work systems on employment outcomes. Drawing on the distinction between "involvement" and "intensification" approach to the implementation of HIWS (Godard, 2004), they argue that innovative workplace practices may produce both positive and negative outcomes for employees. The study investigates a rich set of worker outcomes, including job intensity, job influence, job security, wages, stress, and job satisfaction. They find that workplace practices such as information sharing, teamwork, and training have positive implications for workers. The authors stress the importance of the Finish institutional environment, characterized by strong unions, statutory employee representation and employment protection, in shaping the adoption and impact of workplace practices on workers.

IV. Conclusions

We have described the nature, scope and effects of various non-mandated participatory work practices in Japan, the U.S. and Europe from the perspective of organizational complementarity. Specifically, rather than discussing each work practice in isolation, we have described it as an element of HIWS (High Involvement Work System), an employment system comprised from clusters of complementary work practices. In so doing, we have been able to present a coherent and complete picture of non-mandatory participatory work practices. Furthermore, by applying the common framework of viewing participatory work practices as elements of HIWS to seemingly disparate forms of work practices in different corners of the globe, we have been able to shed light on how participatory work practices play out in different institutional, cultural and regulatory environments.

Lastly we identify substantial research gaps in the international literature on HIWS and, hence, promising areas for future research. First, the empirical literature on HIWS discussed in this paper is largely correlational. Hence, there is room for studies looking at the causal effect of HIWS and relying on exogenous variation in practices associated with HIWS or in some of their drivers. In principle, progress can be made by using field experiments or exploiting exogenous policy changes. Second, more qualitative and mixed-methods research are also needed to understand the underlying mechanisms linking HIWS to firm performance. Third, while our discussion focused on HIWS in the context of advanced countries, we identify a lack of systematic evidence on the utilization and impact of HIWS in developing countries. Fourth, the sorting of employees and managers into HIWS firms remains poorly understood. For instance, it would be interesting to know whether individuals with specific behavioral traits (e.g. risk and time preferences) tend to self-select into HIWS environments. Fifth, it is important to understand better the complementarities between advanced digital technologies (e.g. robotics,

Artificial intelligence, Additive Manufacturing) and HIWS. Finally, there is limited evidence on HIWS beyond conventional private-sector firms. Having more research on the extent and impacts of HIWS in other organizational settings (e.g. public sector, not-for profits, employee-owned firms and cooperatives) would be extremely valuable.

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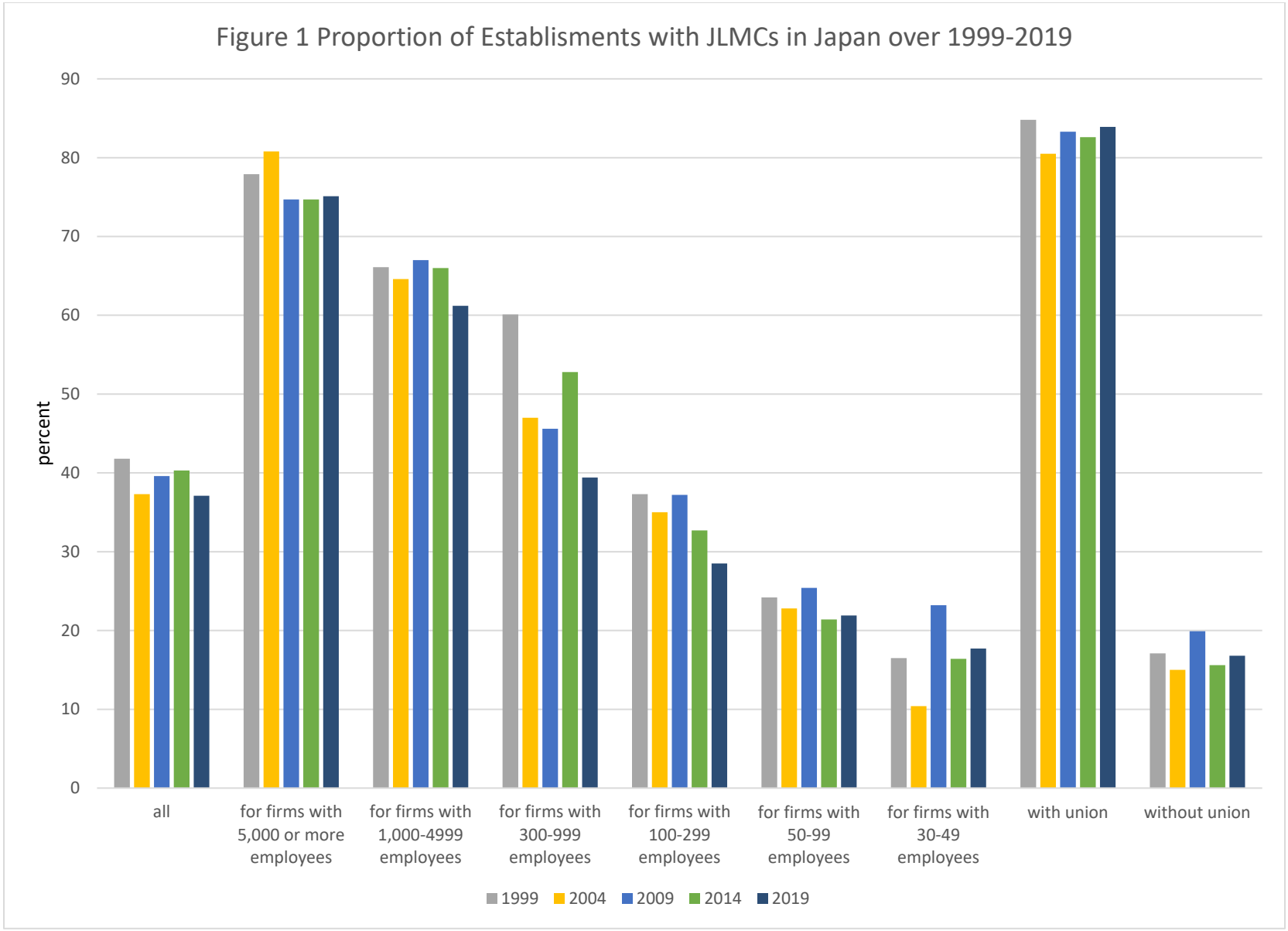
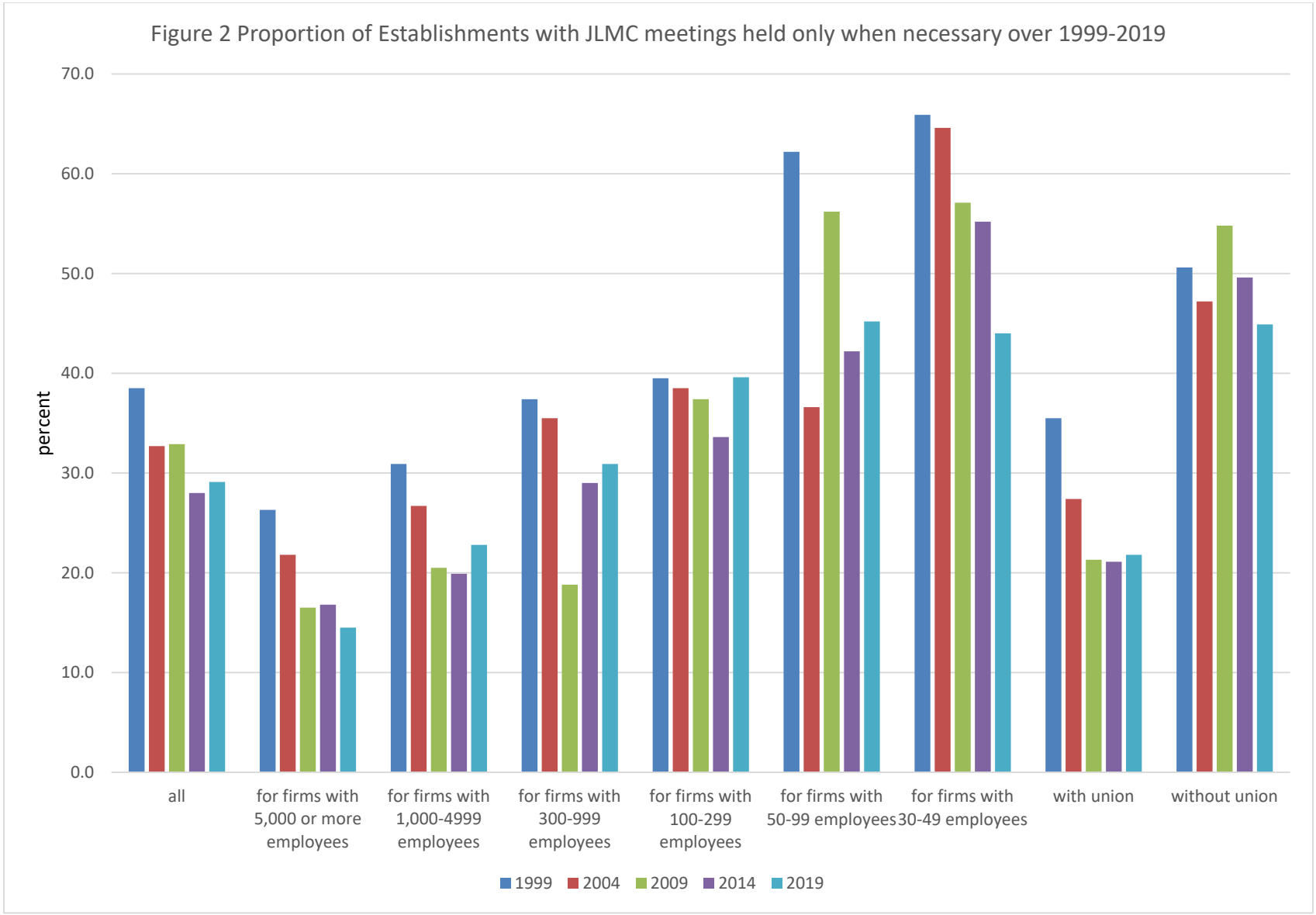


Source: the Survey on Labor-Management Communications, Japan Ministry of Health, Labor and Welfare



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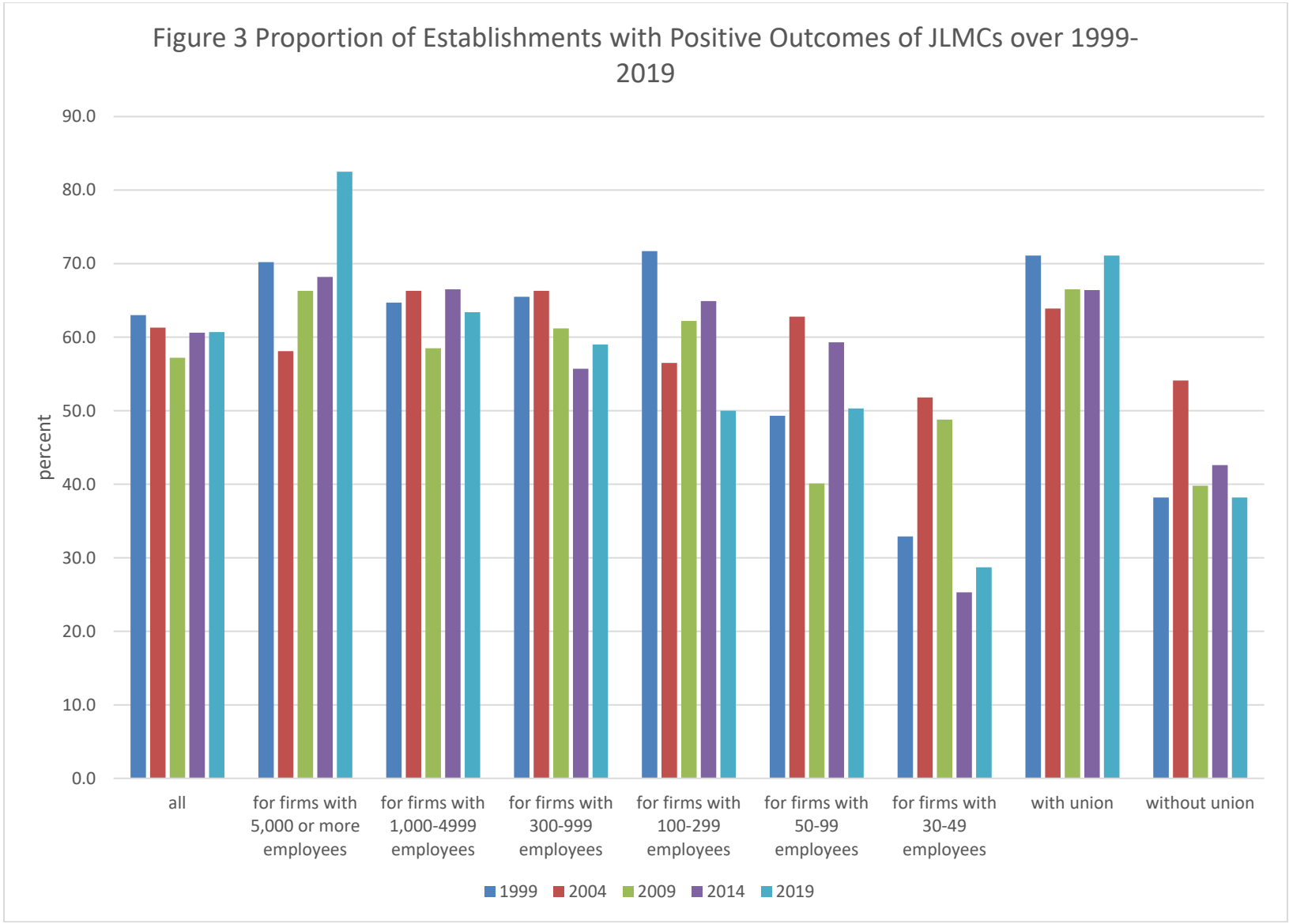

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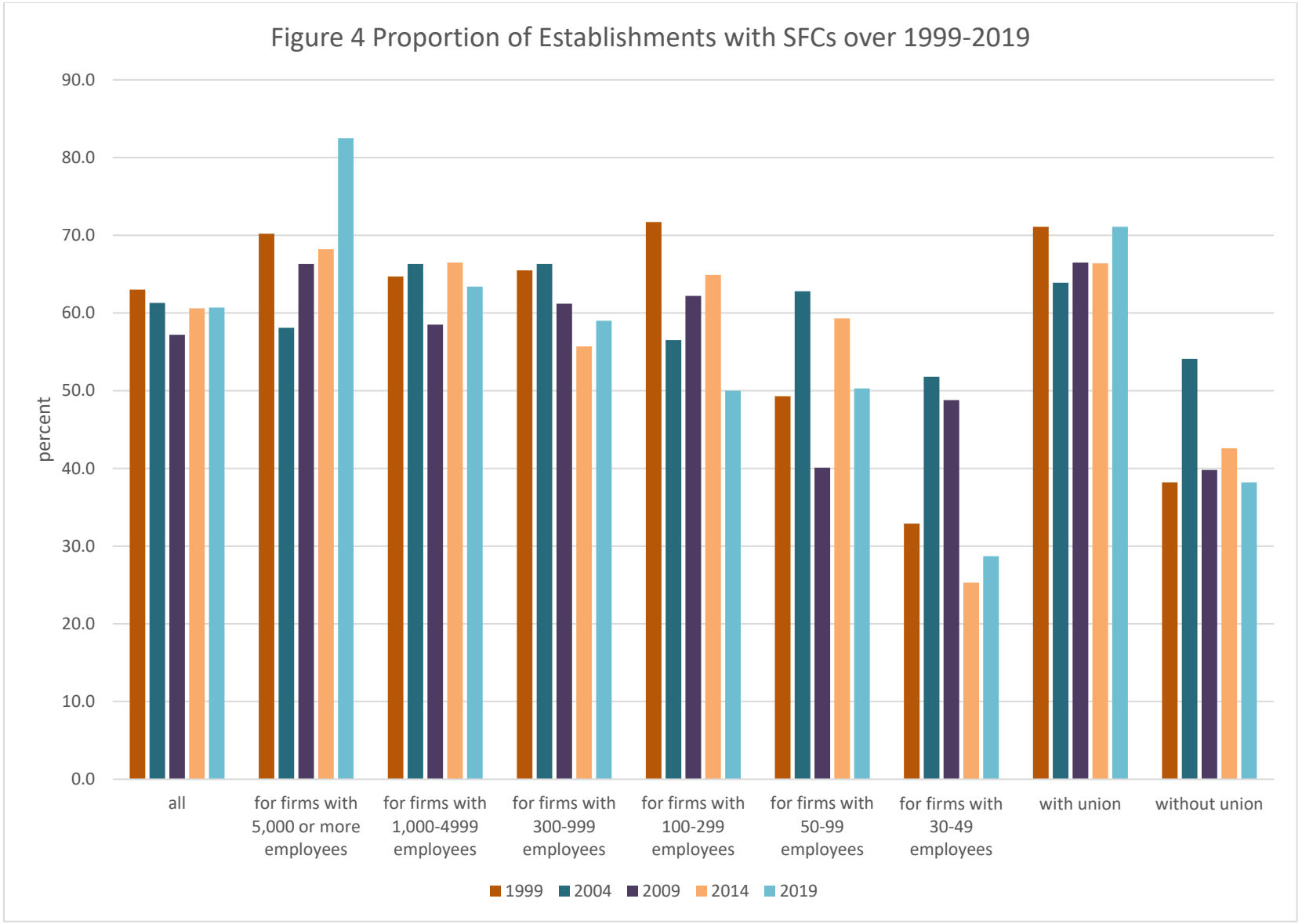

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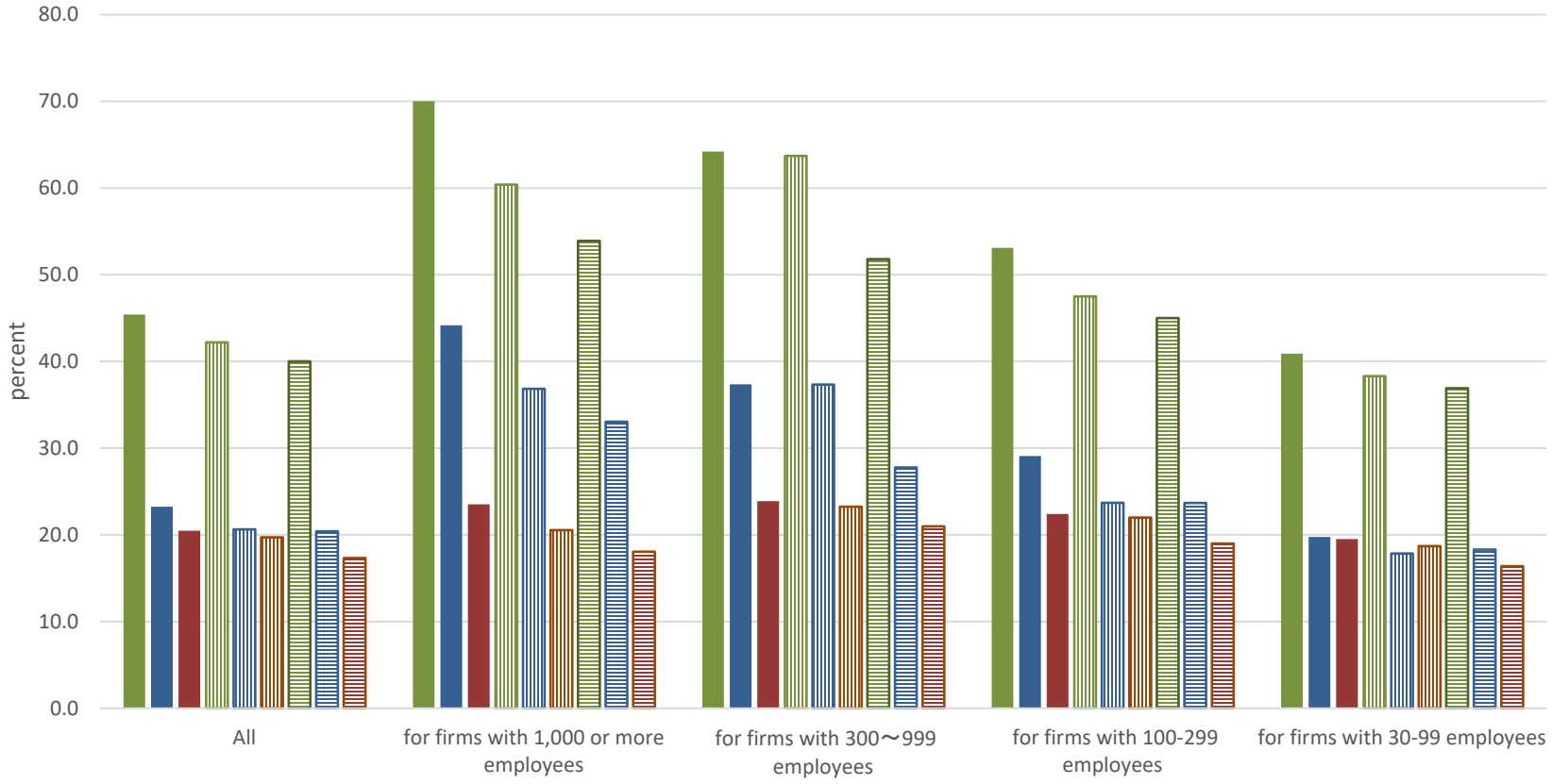
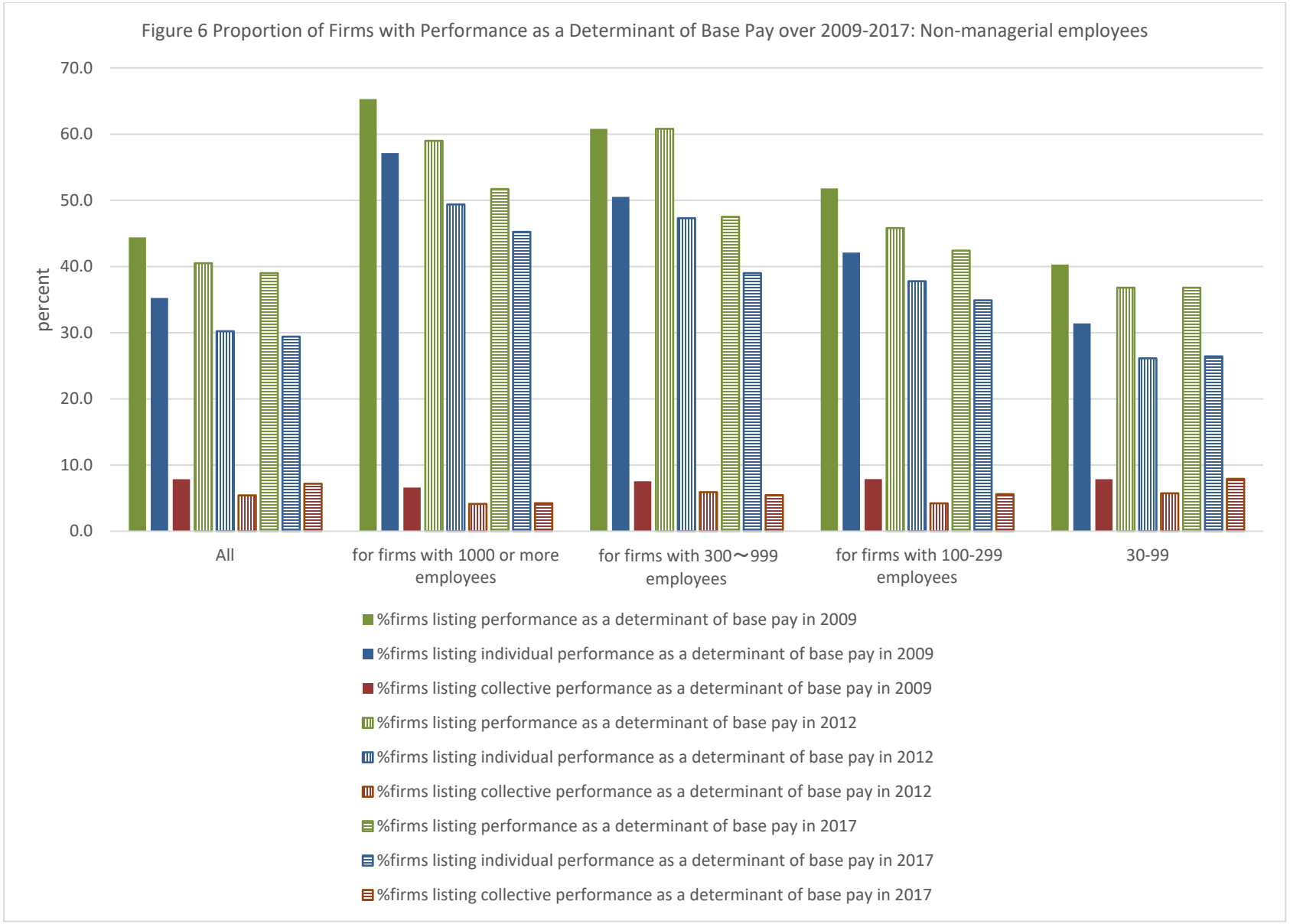
Figure 5 Proportion of Firms with Performance as a Determinant of Base Pay over 2009-2017: Managers

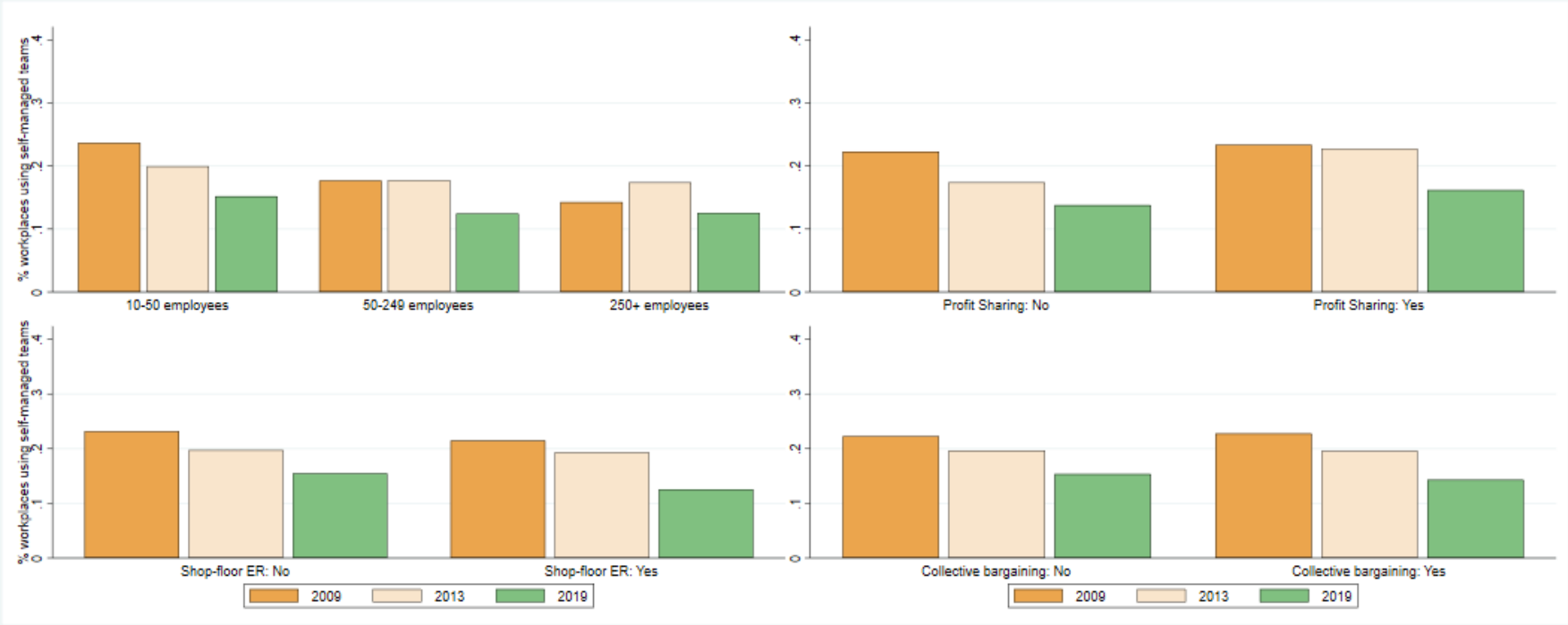


Source: General Survey on Working Conditions, Japan Ministry of Health, Labor and Welfare



Source: General Survey on Working Conditions (GSWC), Japan Ministry of Health, Labor and Welfare

Figure 7. Incidence of self-directed teams in European workplaces



Source: Own elaboration based on ECS 2013-2019

Figure 8. Incidence of information sharing practices in European workplaces

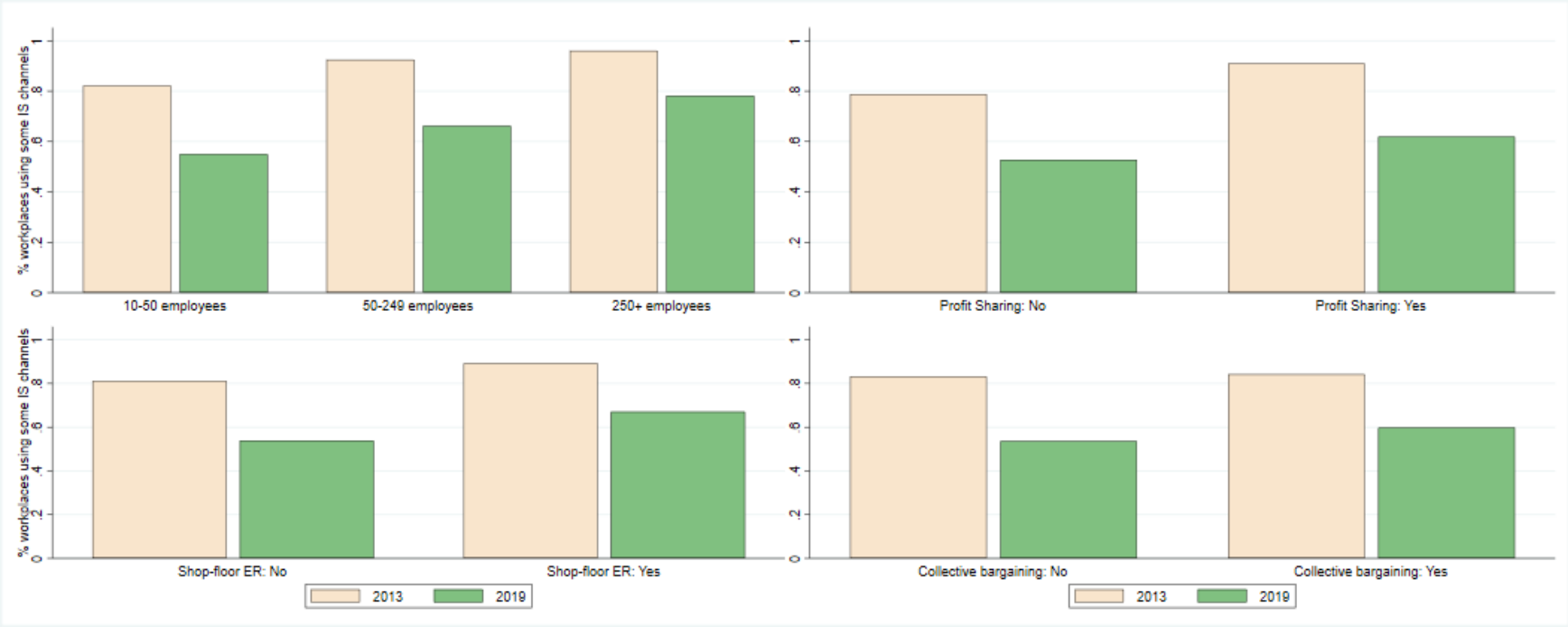


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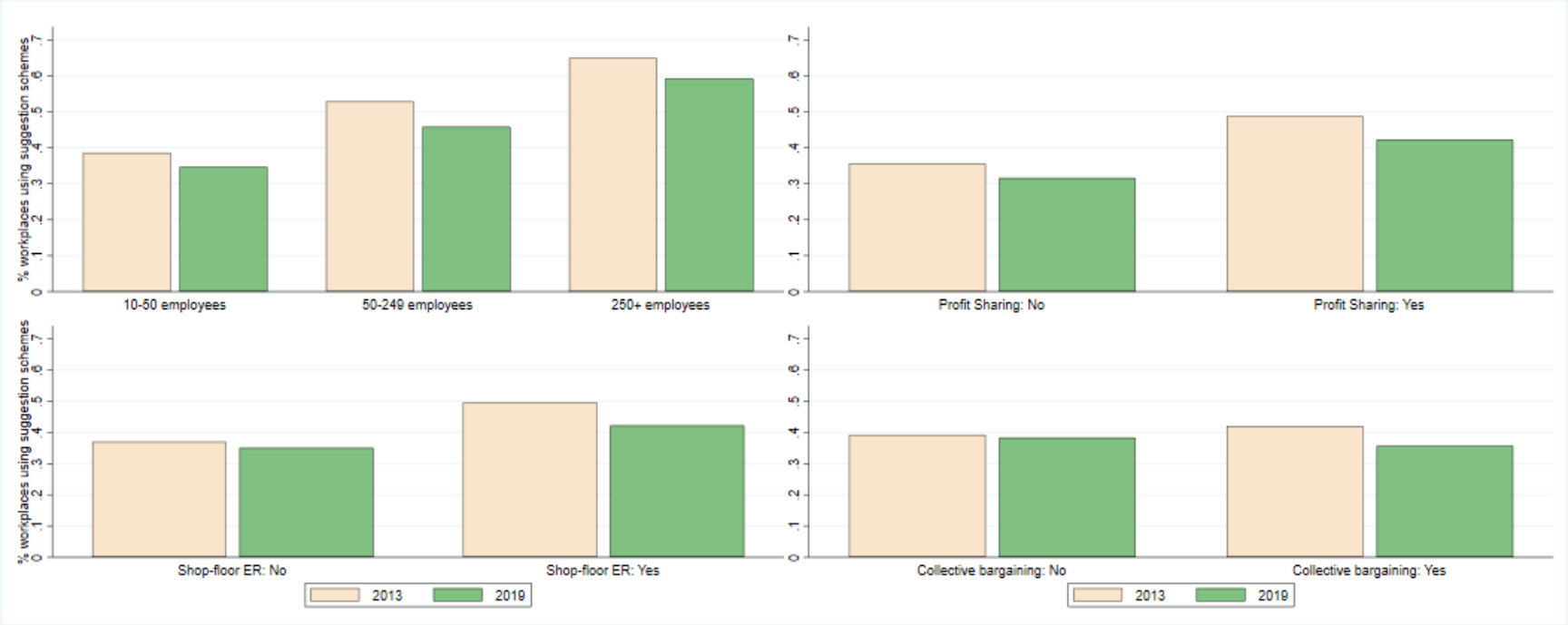
Figure 9. Incidence of suggestion schemes in European workplaces



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