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Explaining variation in the social performance of lean production: a comparative case study of the role played by workplace unions' framing of the system and institutions

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ABSTRACT

Several studies have acknowledged that lean production is implemented in diverse ways across workplaces, thereby generating different outcomes for workers. However, explanations for this variability needs further development. The present article addresses this issue by considering the role played by workplace unions' framing of lean production. It finds that unions' framing is derived from their identities in interaction with available resources in institutional and organisational terms. A case study comparison of the automotive parts industry in Italy and the United States was conducted.

1 INTRODUCTION

Lean production constitutes a diffuse organisational model. While it has been proven capable of increasing companies' competitiveness (Shah and Ward, 2007), its outcomes for workers, namely, its social performance, remain disputed (Distelhorst *et al*., 2016). In focusing on organisational and human resource management (HRM) practices, lean production is perceived as representing a bottom-up approach to implementing technical principles and related techniques aimed at improving both the efficiency of production processes and work experience (Shah and Ward, 2007). This approach would encompass the transformation from Taylor-Ford organisational models to the adoption of both distinctive and traditional (but nevertheless differently regulated) employment arrangements (Godard, 2004; Pagell *et al*., 2014). Indeed, a number of studies have demonstrated that the application of lean production in the field of human capital deployment varies among workplaces. For instance, Adler and Borys (1996) found that in the New United Motor Manufacturing, Inc. auto plant, which was co-founded by Toyota and General Motors and applies lean production principles, workers were considerably more engaged than was the case in traditional Taylor-Ford factories because they were allowed to standardise and formalise the most efficient work procedures by accounting for their working

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conditions. In contrast, paying attention to the British automotive industry, Stewart *et al*. (2009) argued that the realities of lean production involved increased production pressures and greater stress. However, the reasons behind this variation and contrasting consequences for workers remain unclear (Bamber *et al*., 2014).

This article aims to address this variation in the social outcomes of lean production within unionised enterprises through exploring how workplace unions frame the system (Dufour and Hege, 2013). This framing appears to derive from workplace union identity, affected by the character of sectoral labour organisations at the national and especially local (referring to territorial) levels, in interaction with the resources available to it in the institutional context and in terms of plant-level organisational strength. Consideration of the interplay between union identity on the one hand and the institutional and organisational resources available to labour organisations on the other has been already taken into account to explain the influence exerted by workplace unions in the regulation of employment practices (Frege and Kelly, 2003; Lloyd and Payne, 2012). This article's novel contribution consists of its application of such a theoretical framework to account for the varied social performance of lean production in different institutional contexts by also underlining the recursive interconnections between union identity and the resources available with institutional factors playing an important role. Interconnections mean that while institutional and organisations factors affect unions' action representing either resources or constraints, labour organisations can use them (or not) and do so in different ways (Kochan, 2012; Murray *et al*., 2013).

At the same time, it is important to recognise that unions' framing of lean production does not represent the only driver of the different social performances of lean production. As highlighted by Hauptmeier (2012), management ideologies produce specific framings of situations that contribute to substantiate the construction of institutions at the firm level. It follows that management's framing of lean production represents another important driver of social performance. Thus, although this article focuses on workplace unions as a key explanatory actor, the importance of framing by management will be acknowledged, too.

In order to pursue the research objective, a comparative analysis of two unionised plants that belong to the same American multinational company (MNC henceforth) and that operate as independent first-tier suppliers in the automotive sector in Turin (Italy) and Detroit (United States) was conducted. The term 'independent suppliers' refers to the fact that the firms are not owned by car manufacturers. The results reveal remarkable differences that are nevertheless explained by the same theoretical framework. In the Italian plant, unions have resisted the speed-up aspects of the system stressed by managers, while avoiding challenging the latter's claims regarding employee participation. In contrast, in the US plant, the union adopted a concessive approach towards the managerial framing of the system, resulting in stressful working conditions and poor levels of employee involvement.

2 EXPLAINING THE SOCIAL PERFORMANCE OF LEAN PRODUCTION

Lean production represents a multidimensional approach to manufacturing based on an integrated set of managerial practices and technical principles, including just-in-time supply and continuous improvement aimed at increasing productivity and minimising waste and stock (Shah and Ward, 2007). The technical principles are considered as requiring employee cooperation in order to be realised through the

implementation of specific organisational and HRM practices. In this respect, compared with Taylor-Ford organisational models, lean production is seen to be shaped both by distinctive employment arrangements and by different and innovative regulations of traditional work practices. Teamwork and employee participation represent employment arrangements that are seen to distinctively characterise the system (MacDuffie, 2003), although traditional employment arrangements such as workload and working time are involved as well. However, within lean production, the regulation of traditional employment arrangements appears to take employee needs into account, which would prevent lean organisational practices from excessively increasing work intensity (Bouville and Alis, 2014; Pagell *et al*., 2014). Traditional employment arrangements can also be innovatively conceived (Godard, 2004). For instance, just-in-time supply requires flexible working hours that can be regulated through the banking of hours instead of by relying on overtime and temporary layoffs. This regulation would reduce labour costs and increase compatibility between employee work and family/personal commitments (Katz *et al*., 2013).

Nevertheless, while lean production has continued to be propagated owing to its positive outcomes in terms of companies' competitiveness (Shah and Ward, 2007), its consequences for employment conditions remain highly disputed (Distelhorst *et al*., 2016). At the beginning of the implementation of lean production in Western countries in the early 1980s, three positions emerged.

The enthusiastic position argues that lean production would lead to positive results for employees by encouraging their participation and control over their work. The promises of the model outlined would be fully realised. Thus, unions and workers should be expected to embrace management initiatives aimed at implementing the model (Womack *et al*., 1990). These optimistic views have been challenged by critical studies that highlight how lean techniques and HRM practices instead stimulate increased work intensity and stricter managerial control without facilitating employee participation (Babson, 1995). Unions and workers should therefore be expected to fiercely oppose managerial attempts at implementing this organisational system. The third position has been advanced by transformation theorists (Kochan *et al*., 1997). These scholars claim that lean production has a positive impact on employment conditions because participative industrial relations systems would be encouraged by the adoption of this organisational model. Unions would become full joint partners embracing the positive features of employee engagement in continuous problem-solving. The primary difference between transformation theorists and those expressing the enthusiastic position consists of the fact that the former emphasise how union involvement in company decision-making is crucial to ensuring that the implementation of lean production benefits workers.

Numerous studies have subsequently come to recognise that lean production's implementation and outcomes for workers vary across workplaces (Bouville and Alis, 2014; Delbridge *et al*., 2000). The organisational system has been identified as including both speed-up and employee involvement aspects, hence encompassing both coercive and enabling dimensions for workers, of which one may become prevalent in different firms (Adler, 2012; Vallas, 2006). However, the literature has not managed to explain why lean production implementation varies and subsequently yields different outcomes for workers (Bamber *et al*., 2014; Vidal, 2007). This article aims to address this theoretical gap in the research by concentrating on the role played by workplace unions. Some studies have recognised their importance and not only in oppositional terms (Blanpain, 2008; Richardson *et al*., 2010; Vallas, 2006), thereby

meeting transformation theorists' position. However, a deeper analysis of workplace unions' influence remains necessary.

The manner in which workplace unions frame organisational systems—in this case, lean production—affects the content of the related practices adopted (Dufour and Hege, 2013). Framing processes are defined as the ways in which unionists perceive and interpret changes in their context as threats or opportunities (Frege and Kelly, 2003). Innovative practices are encouraged when unions seek joint problem-solving to improve companies' competitiveness by promoting the active role of workers (Geary and Trif, 2011). In contrast, organisational changes that facilitate positive outcomes for both firms and workers are hindered where labour representatives are attached to adversarial approaches towards employers and/or if they are too weak or concessive towards firms' needs (Roche and Teague, 2014).

The literature has highlighted that unions' framing of phenomena is not neutral and instead results from union identity in interaction with national institutional and organisational resources (Frege and Kelly, 2003). However, this theoretical framework has not been applied to explain the varied social performance of lean production. The present article aims to pursue this goal by additionally underlining the recursive interplay between workplace union identity and institutional and organisational resources. Certainly, available resources are relevant in constraining or supporting union choices, but they also give labour organisations (and actors in general) leeway to strategically decide whether and how they should be activated (Hauptmeier, 2012; Murray *et al*., 2013).

Union identity is constituted by ideas and ideational factors that shape both the union's approach and its actions towards employers (Hodder and Edwards, 2015). Such ideas are contingent on the level of antagonism or collaboration towards companies expressed by workplace union representatives and resulting from their conceptualisations of employment relations. These identities are affected by the labour organisations to which workplace union representatives belong (Hyman, 2001) and by the micro socio-economic and political conditions in which the latter are immersed (Locke, 1992). Regarding the latter, when attention is placed on auto suppliers, sector-based local labour organisations, which can express specific positions within the national organisation, affect the identity manifested by workplace unions in such firms. This influence occurs owing to the linkages that exist between plant-level and local labour organisations, whose approaches are imbued with the character of the industrial relations developed with auto makers (Locke, 1992; Negrelli, 2000). The importance played by the character of industrial relations reminds that managers also have an important role in substantiating the uncertain industrial relations institutions and therefore affect the outcomes experienced by unions and the workforce through their specific framings of organisational systems. For instance, if managers emphasise the search for common interests of both parties as opposed to their divergent positions to attain quality and productivity gains, organisational systems like lean production can be framed by social actors to pursue their enabling dimension. This possibility is hindered if managers aim to increase competitiveness unilaterally and through heightened work intensity (Avgar and Kuruvilla, 2015).

However, union identity generates specific unions' framing of situations in interaction with the institutional and plant-level organisational resources available, and the analysis concentrates on this subject although recognising the importance of management framing. As regards the institutional context, elements including collective bargaining systems, labour laws and the characteristics of business relations with

customers appear to be salient in terms of union action over organisational and HRM employment arrangements (Doellgast, 2010; Doellgast and Greer, 2007). Plant-level union organisational strength in terms of union density and support constitutes a further relevant resource on which workplace unions can rely in order to pursue their strategy (Locke, 1992). There is thus a need to systematically examine workplace unions' framing of lean production that results from union identity in recursive interconnection with these resources by comparing different unions and institutional contexts to explain variations in lean production social performance.

3 THE TWO CONTEXTS UNDER STUDY

In order to answer the research goal, a case study comparison of two plants was conducted. The two factories—one active in Italy (Turin) and the other in the United States (Detroit)—are unionised automotive plants that operate as independent first-tier suppliers, make the same products and belong to the same American MNC. The two contexts were selected due to their differing features. The validity of the explanation of the social performance of lean production can thus be reinforced if the elaborated theoretical framework proves relevant across different union traditions and regulatory environments. In the following paragraphs, the elements that are perceived as shaping the unions' framing of lean production in the two countries and local contexts are outlined with reference to the auto sector and specifically the auto parts system. Subsequently, hypotheses concerning the implementation of lean production are formulated.

Regarding organised labour, the predominant union in the metal sector (for which data are available) in Italy is the *Federazione Impiegati Operai Metallurgici* (CGIL-FIOM, henceforth FIOM), followed by the *Federazione Italiana Metalmeccanici* (FIM-CISL) and the *Unione Italiana Lavoratori Metalmeccanici* (UIL-UILM, henceforth UILM) (Federmeccanica, 2009; Tolomeo Studi e Ricerche, 2013). FIOM tends to demonstrate a good level of organisational strength in workplaces in medium- and large-sized firms. The three unions are divided by ideological cleavages that are relevant as cultural references. FIOM's identity is class oriented and expresses a political militancy based on the principles of struggling with capital, whereas the other unions regard themselves as actors of social integration (Hyman, 2001). However, these different union identities have been primarily expressed at the national level. In workplaces, FIOM has represented a resolute negotiating actor but open to discussing firms' requirements in terms of flexibility and competitiveness in line with the 'micro corporatism' that features labour–management relations in the Italian context (Regini, 1995). Interunion differences in the metal sector have emerged in very few workplaces inclusive of Fiat given the company's confrontational behaviour towards unions and workers (Cella, 2011; Negrelli, 2011). These tensions have been exacerbated by the company's decision to escape the wide sectorial and centralised collective agreement [*Contratto Collettivo Nazionale di Lavoro* (CCNL)] of the metal sector following the 2008 economic crisis. An adversarial relationship between Fiat and FIOM has historically been highly apparent in Turin. This has affected the industrial relations of the local auto system due to the linkages between plant-level and local labour organisations and between the car maker and its main local suppliers, too (Locke, 1992; Negrelli, 2000; Rebaudengo, 2015; Regalia, 2009). Indeed, this peculiar, adversarial character of local industrial relations attests that the union

collaboration with managers emphasised by the notion of 'micro corporatism' leads to downplay the role of union framing.

In the United States, the International Union United Automobile, Aerospace, and Agricultural Implement Workers of America (henceforth UAW) has historically represented workers in the automobile sector. Its identity is market-oriented and prioritises collective bargaining, through which unions aim to attain workers' rights at the workplace level by taking market conditions into account. At first, this identity was complemented by adversarial approaches, through which significant benefits for workers were won. However, since the national automakers crisis in the 1980s, the UAW has embraced the principle of pursuing collaborative collective bargaining activities with employers (Babson, 1995). This shift in union identity has often turned into concessions aimed at safeguarding employee job security, unionisation and sustaining companies' activities (Godard, 2009; Greer, 2009). Such concessions assumed an unprecedented level following the economic recession and the government bail-out of General Motors and Chrysler (Hunter and Katz, 2012; King, 2010). However, under the concessive trend followed by the UAW, conflict resulting from resisting concessions has occurred in some plants given the (albeit declining) organisational strength that unions continue to possess in auto workplaces (Greer, 2009; Katz and Darbishire, 2000). In other workplaces, participative or more collaborative strategies have aimed to provide an independent decision-making role for labour within companies' functioning (Kochan *et al*., 1994; Rubistein and Kochan, 2001). At the local level, the 2008 economic crisis of the auto sector has particularly affected areas of the United States where the automotive sector was highly rooted and developed, including Detroit. Thus, the national strategy aimed at strengthening workers' job security by sustaining firms' competitiveness was of particular relevance for these areas and their local unions, to which workplace labour representatives are often closely connected and affecting their approaches towards employers (Babson, 1995; Rattner, 2010).

As far as institutional factors are concerned, collective bargaining systems, labour laws and the governance of inter-firm relations are deemed relevant in terms of affecting workplace unions' behaviour on organisational subjects. Regarding collective bargaining institutions, Italy has been interested in the process of 'organised decentralisation' since the early 1990s because CCNLs remain central. However, the situation may have changed in 2011, when Fiat adopted its own collective agreement opting out of the CCNL of the metal sector (including the auto sector) and whereby from Confindustria (the main Italian employers' association), too. This decision was legitimised by the centre-right government with the approval of Art. 8 of the 138 Law Decree in the same year. Nevertheless, Confindustria and the three main unions restated their willingness to follow the traditional path of 'organised decentralisation', signing an agreement that allowed for the controlled and much more limited potential derogations of the CCNLs (Marginson, 2015). Evidence suggests that utilisation of the opting-out procedures available has been limited and that collective bargaining remains largely reliant on the pre-crisis structure (D'Amuri and Giorgiantonio, 2015). As a result, the overall persistent 'organised decentralisation' offers space for actors' agreements to jointly adopt organisational changes (such as lean production) at the firm level but may also hinder workplace-level changes because social actors can rely on centralised detailed regulations (Treu, 2011).

On the other hand, the US context was initially characterised by a decentralised system of collective bargaining without the presence of multiemployers' agreements

and was coordinated through pattern bargaining. Since the 1980s, the situation has changed within a process of 'disorganised decentralisation'. The unionisation rate has also declined with the growth of non-unionised plants in the auto parts system, impeding coordination through pattern bargaining. This phenomenon can be connected to aggressive employers' strategies aimed at reducing labour costs and increasing flexibility unilaterally (Hunter and Katz, 2012; Katz *et al*., 2013). The result has been a deterioration in employment conditions, which can threaten employees in unionised firms despite the fact that labour organisations remain present in the sector (Katz and Darbishire, 2000; Katz *et al*., 2013). Under this system of collective bargaining, organisational changes that generate positive outcomes for workers can potentially be attained by bargaining at the firm level (Appelbaum and Batt, 1994; Kochan, 2012). However, such negotiations require the support of well-established unions (Roche and Teague, 2014), a situation that appears to be under threat in the auto parts industry (Katz *et al*., 2013).

Moreover, in terms of labour laws, the two countries demonstrate important differences. In Italy, workplace unions possess information and consultation rights in the field of health and safety—to which workload is related—largely connected to Legislative Decree 81/2008. In addition, unions can enforce legislative provisions that protect employees from unfair disciplinary sanctions and dismissals (weakened in 2014 by Law 183/2014), which can limit employers' coercive approaches. Regarding continuing training, which can be important as a means of reinforcing employee skills in teamwork, firms are required to pay a training fund levy, which can be used to fund particular training programmes only if such activities are agreed upon by the unions. In the US context, no institutional provisions exist on which workplace unions can rely to bargain for organisational and HRM practices (Colvin and Darbishire, 2013).

Within the automotive supply chain, the governance of inter-firm relations can also contribute to determining the territory of workplace unions (Doellgast and Greer, 2007). In Italy in the early 1990s, Fiat launched the programme *Guided Growth* (*Crescita Guidata*) to help direct suppliers to develop new competencies in order to achieve greater quality and cost targets imposed by the market via a reliance on long-term contracts (Whitford and Enrietti, 2005). However, the car manufacturer relied on its market power to impose a constant price reduction and fluctuating quality requirements on suppliers. In the United States, the 'Big Three', namely, the car manufacturers Ford, General Motors and Chrysler, which dominate car production in northern parts of the country, govern their relations with firms in the auto supply chain primarily on the basis of market principles by arranging short-term supply contracts. They collaborate with first-tier suppliers in the design and production of modules to meet quality standards, thereby paving the way towards relations characterised by 'collaboration without trust' (Helper and Sako, 2010). However, quality issues are also significant in both contexts given the strict standards required, in large part related to the presence of considerable international competition. These quality requirements can push social actors to reinforce employee participation and skills (Helper and Kiehl, 2004; Zirpoli and Caputo, 2003).

Overall, given the union traditions, the institutional context and the plant-level organisational resources available, from their recursive interplay, we would expect different lean production implementations and subsequent outcomes for workers in the two plants under investigation, albeit not in a linear way and with some different possibilities. In the Italian case, the main union framing of lean production expressed by FIOM in the auto sector in Turin is likely to emphasise union opposition towards

the company's likely requests of flexibility in terms of higher work intensity, without challenging managers over the adoption of employee involvement practices. This opposition is made possible by labour-friendly industrial relations institutions setting up the opportunities for such opposition, although different union framings leveraging other institutional provisions that provides a basis for higher joint innovation (e.g. training) remain possible. On the other hand, in the United States, a legacy of concessive unionism, which has been exacerbated by the 2008 economic recession and its impacts on the Detroit area, is combined with a general lack of institutional provisions that sustain workplace union action. As a result, lean production can produce suboptimal or negative results. However, more adversarial or participative union strategies that entail better outcomes for workers cannot be excluded.

4 RESEARCH DESIGN AND METHOD

The case selection was motivated by the fact that both plants operate as unionised, independent, first-tier suppliers and applied principles that shape the lean paradigm, including just-in-time supply, continuous improvement, preventive maintenance and quality management, as well as related techniques such as *kanban*, one-piece flow (just-in-time supply), *kaizen* (continuous improvement), scientific studies for standardisation, *poka-yoke* and visual management (quality management). Their manufacturing processes were organised along assembly lines. The module supplied was voluminous and hence required supply plants to be placed near customers' factories. The US plant supplied Ford and General Motors, while the Italian plant supplied Fiat.

The two factories shared numerous characteristics that ensured their comparability. They made the same product in the same segment of the automobile market, were founded at nearly the same time (1998 for the Italian factory and 1999 for the American factory), were similar in size (199 and 250 employees in the Italian and American plants, respectively), were profitable and predominantly employed blue-collar workers (representing more than 80 per cent of the workforce). In the Italian plant, FIOM constituted the dominant union both in terms of members and votes, followed by UILM. As established by law, the unions formed the *Rappresentanze Sindacali Unitarie* (RSUs). The labour organisation operating in the US plant was the UAW, to which all shop stewards belonged. The RSUs could rely on a good rate of unionisation (greater than 30 per cent) (Visser and Checchi, 2009), while in the US facility all blue-collar workers were union members, as established by the plant's contract. Both the RSUs and shop stewards were well-connected with their territorial union organisations.

Regarding lean production application, both traditional and distinctive employment arrangements were taken into account and investigated in reference to specific arrangements and related variables. Within the group of traditional employment arrangements, variables were also intended to capture their eventual innovative regulation. Among the traditional group, working time and workload were included, whereas teamwork and direct participation were analysed within the distinctive employment arrangements. Traditional and distinctive employment arrangements were examined under an analytical lens, and they were thus not meant to predict the content of the employment arrangements examined here or the content of the related variables. The operationalisation of these employment arrangements is described in Tables 1 and 2.

Table 1: Employment arrangements and variables within the group of traditional employment arrangements

Traditional employment arrangements	
Employment arrangements	Variables
Working time	Bank hours allowed for adapting working time to production needs without changing pay and/or temporarily dismissing workers. Overtime amount (the standard working time was equal to eight hours per day in both plants) and the related period of notice.
Workload	Level of saturation times (i.e. planned working time within cycle times, in turn referring to the time within which employees were expected to perform their tasks) (Adler *et al*., 1997).

Table 2: Employment arrangements and variables within the group of distinctive employment arrangements

Distinctive employment arrangements	
Employment arrangements	Variables
Teamwork	Employees autonomously carrying out quality control and minor maintenance. Supervisors inspired by leadership approaches in managing workers and hence relying on training and coaching actions (Fairris and Tohyama, 2002; Teague and Roche, 2012).
Direct participation	Tools of workers' voices (e.g. suggestion boxes or continuous improvement activities) used by also considering the opportunities available for employees to affect their working conditions (Lansbury and Wailes, 2008).

In order to examine the social performance of lean production and the processes that explain the results, a mixed methods/multiple-source research design was implemented (Gibson, 2017). As far as the mixed methods approach is concerned, different research techniques were combined over the three-month period spent at each factory by the same researcher (in 2010 for the Italian plant and in 2011 for the American plant). Qualitative data were collected through semi-structured interviews, ethnographic direct observation (which also allowed for informal conversations with people) and the analysis of companies' documents and collective agreements, and they were all combined with quantitative data (a questionnaire for blue-collar workers). Qualitative data were used to examine processes and explain statistical outcomes, and the latter were used to generalise workers' responses regarding employment

practices at the two plants (Creswell and Plano Clark, 2007). Both objective data (e.g. information on working and saturation time) and subjective appraisals (actors' opinions) were combined to rebuild employee working experiences under lean production.

The multiple-source approach involved managers, unions and blue-collar workers. Semi-structured interviews were conducted, recorded and fully transcribed with the following stakeholders: all managers at the two plants (19 in Italy and 20 in the United States), all RSUs and all shop stewards (three in each case) and two union officials who were active at the territorial level in both Turin and Detroit. Workers' views were collected through structured (non-recorded but immediately transcribed) interviews (48 in Italy and 67 in the United States) and via a questionnaire. The interviews concerned the organisational and HRM practices related to lean production and the character of firm-level industrial relations in addition to other elements (e.g. internal labour markets and information on firm's activities) that are not relevant to the subject treated in this article. Interviews with trade unionists and managers also focused on the relationship of workplace labour representatives with the local labour organisation and their organisational strength. Following the fieldwork, the content of all of the interviews was thoroughly examined, and information and data regarding the subjects under scrutiny were identified, analysed and triangulated.

Regarding quantitative data, the questionnaire had a response rate of 73 per cent (i.e. 128 out of 176 blue-collar workers) in Italy and 54 per cent (i.e. 112 out of 209 blue-collar workers) in the United States; however, of those who responded, more American workers filled in the questionnaire entirely. Given that not all workers answered every question, the Marbach test (symbol:) was used to calculate sample representativeness separately for each item in the two plants. The formula for the Marbach test is $\sqrt{N/(N-1)n-1/N-1}$. In empirical research, values below 0.10 are usually accepted as reliable (Leoni and Albertini, 2009), and all the statistical data presented are representative because the parameter is well under this threshold. In answering the items on the questionnaire, workers were often presented with scales that included the values of high, medium and low. In some cases, workers were asked if they agreed or disagreed with a certain sentence (and in a different layout) to reduce the response set risk. Within the employment arrangements linked to lean production, this type of questioning occurred for the topic of employee participation. The questionnaire also contained questions concerning internal labour markets and relations among workers. In the article, employees' answers are reported in relation to the questions concerning the organisational and HRM practices used to enquire about the social performance of lean production.

5 TRADITIONAL EMPLOYMENT ARRANGEMENTS

5.1 Working time

In both factories, the management sought to link the manufacturing activities to the just-in-time principle governing the lean production system arranged with the car manufacturers. Such a link required the availability of workers in order to meet production needs, but these needs could vary due to customers' orders and the (mal)functioning of the assembly line. Neither plant considered the banking of hours to alternate working times according to market demand despite the fact that in the Italian case, the national agreement foresaw the possibility of introducing this system through company- or plant-level collective bargaining. Instead, managers requested

overtime in the case of peaks while using temporary layoffs in the case of market breakdowns, with extra time being more frequently required in the case of good market demand for the two plants' products. In spite of these common managerial approaches, the outcomes for workers differed significantly.

In the Italian factory, overtime was limited to a certain number of hours per week and was usually communicated in advance. In the American factory, on the other hand, workers operated for about 11 hours per day. Moreover, given that overtime could be required without notice, the American workers had no control over their working time because—as all actors noted—the workers knew when they had to enter the plant but not when they could go home. This fact had negative implications for workers' families and personal commitments. The contrasting results between the two plants—as seen through interviews and direct observations—were confirmed by the statistical data regarding employee opinions, with many American workers (unlike their Italian counterparts) claiming that their working time was long (Table 3).

These different results in relation to the length of working time could be explained by the different framing of lean production that workplace unions followed, which in turn resulted from the interactions of their identities with the available institutional and plant-level organisational resources. In the Italian plant, the agreement signed with Fiat foresaw the indicative quantity of the supply being shipped every day, with a certain degree of flexibility in terms of the timing of requests and the maximum amount that could be required of different variations of the product. This form of organisation was due to two factors. First, Fiat and the first-tier supplier had a long relationship, in which the car manufacturer collaborated with the supplier to achieve the efficiency it sought. In fact, the supplier had worked with Fiat since the opening of its Turin plant in 1998. Second, the other competitor operating in the area had also been working for Fiat for many years. As a result, Fiat's supply request within this segment of the automotive supply chain was shared between these two first-tier suppliers, who competed among themselves but with no other competitors. Overall, the building of long-term relations with the car manufacturer—along with competition based on the presence of another firm—allowed for a certain organisation of the supply system that also concerned the quantity and timing of the supply.

> I would say we are like a department of Fiat, and if there are problems, we consult each other. […] We have always worked together. We have one competitor, which is company X, and the competition concerns the price and therefore also efficiency […]. We have both always worked for Fiat. The current market is a mess, and it is critical to be efficient. However, with Fiat, we have a contract that stipulates the maximum supply they can ask for in a day. (Italian Human Resource Manager)

Table 3: Workers' answers to the question concerning their evaluation of the number of working hours, = 0.049 (Italy) and = 0.067 (United States)

Category	Italy (no. of responses)	Italy (%)	United States (no. of responses)	United States (%)
Low	24	20	7	7
Medium	80	64	24	22
High	20	16	77	71
Total	124	100	108	100

In 2010, Fiat began asking for supplies in a more variable manner on the grounds of the flexibility foreseen by the supply contract because the market was becoming more unstable and there was a need to more promptly meet customers' requests. Furthermore, Fiat requested particular versions of products in greater amounts than had been established by contract and without adequate timing (e.g. in the late hours of the shifts) to meet the higher level of market instability. In this situation, managers asked for longer mandatory overtime on short notice in order to cope with Fiat's variable orders within a just-in-time production system, without foreseeing additional compensation (compared to the system established by the CCNL). The initial regulation of overtime was established by the CCNL of the metal sector (2008), where it foresaw maximum overtime limits of two hours per day, eight hours per week and four working Saturdays per month. The CCNL also required employees to be provided with adequate notice for overtime requests apart from in the case of a sudden and serious event. Nevertheless, firm-level collective agreements could be used to define different regulations, and managers asked for greater flexibility, while claiming that they had no intention to escape the CCNL. Supported by their local labour organisations, the RSUs manifested their unwillingness to grant these concessions by leveraging the provisions established by the CCNL and their bargaining rights. They framed these managerial demands connected with the just-in-time lean principle as a method of extracting more added value from workers and as being certain to damage employment conditions.

> Concerning overtime regulation, we have had strong arguments with the management. They often refer to just-in-time supply and all this stuff, asking us to be flexible. But in our opinion, employee working conditions cannot be worse. (FIOM RSU)

The RSUs' collective bargaining behaviour was rooted in an adversarial position towards the employer. They perceived themselves and the union in general as having the objective of achieving gains for workers under a system of power relations with the firm aiming to extract further added value from workers at its own advantage. This position was in line with the adversarial approach expressed by FIOM, both at the national and local level in the auto sector. At the same time, workplace unions were especially affected by the territorial level of the labour organisation to which they were closely connected. The RSUs' negotiations regarding working time and other subjects were also sustained by good organisational strength. Workplace union representatives could rely on a good unionisation rate and worker participation in their activities. Employees expressed agreement with the RSUs' positions.

However, it is important to note that when commenting on these managerial proposals regarding extended and notification-free overtime, labour representatives did not mention issues of the plant's competitiveness or job security in spite of changes in customer requests and the instability of the market. The RSUs relied on the company's long-term relationship developed with Fiat and in particular claimed that there was little possibility of their plant closing due to the presence of just one competitor. Moreover, competition with the other company was mitigated, especially by the national agreement as well as by the presence of unions in the other plant.

> Competition is not like that. […] Company X is our competitor, and if one company does not do Fiat's job, the other company does it. […] Company X has the union. Maybe we have some different things, but on the whole, our agreement is similar. (FIOM RSU)

Thereon, it emerged that the contractual provisions and the type of relationship between suppliers and Fiat were critical factors in sustaining the adversarial union

collective bargaining approach, although different union framing leveraging other institutional resources for shared innovations (e.g. CCNL for banking of hours) remained feasible.

The US plant, on the other hand, granted complete availability to Ford and General Motors in terms of the quantity and timing of the supply system. This means that for any given day, only indicative quantity was established for the supply, and there were no advance notices about its planning because orders were communicated to the supplier on short notice. The customers and the supplier had a good relationship in terms of design and manufacturing activities. However, with the exception of Ford, this support from car manufacturers did not lead to the development of long-term business relations. Over the years, the plant constantly fluctuated between having General Motors and Chrysler as customers, and the system was largely open to competitors. The plant had three competitors in the area. Thus, managers wanted to satisfy these car manufacturers' requests to prevent customers from assigning the production of the module to another supplier. In the case of Ford, the situation was different. The plant had always worked with Ford, which privileged unionised suppliers owing to the good relationship it had developed with the UAW.

> In the plant in which I worked, we refused to have the union three times. During the election campaign, the HR manager of the plant and managers from the headquarters gave their own opinion about the union. This happened until the last time, when they told us that we had to vote for the union; otherwise, we would not have been able to get Ford's business. (US Maintenance Manager previously employed as a production worker)

Managers wanted to require unions and workers to support the just-in-time requirements without negotiations. The union, in turn, was aware of this situation of high demand from customers. It also realised that one of the three competitors had non-unionised plants in the area, and such a company could easily obtain employees' full cooperation concerning overtime (and other aspects of employment relations). In this constraining institutional situation and given the economic crisis, in the plant's 2010 agreement, the union decided to accept the managerial proposal to not establish any threshold for overtime and to maintain the possibility of being asked for it without any notice. The plant-level agreement entirely regulated overtime given the absence of both sector-wide national agreements and labour laws that provided limitations. Competitive pressures were considered more important than the fact that non-union competitors represented a minority in the area, and the employment conditions that were bargained for within the unionised factories were thereby more diffused. The collaboration with Ford was also not leveraged, and the same occurred with the substantial organisational strength on which shop stewards could count. All blue-collar workers were union members and participated in union activities expressing support for shop stewards' positions. The just-in-time lean principle and related requirements of considerable working time flexibility as expressed by managers were framed by shop stewards as a crucial means of supporting employees' job security by strengthening the plant's competitiveness.

> We accepted the managerial proposal concerning overtime because we wanted to keep our jobs. We have to assure that projects stay on track and that machines and equipment are always in the ready mode. We cannot fall behind on our customers; otherwise, they can go to chicken plants, where there is no union. (UAW Shop Steward)

Workplace union identity was based on notions of strict collaboration with employers to sustain employee job security by reinforcing the plant's competitiveness. Shop stewards

shared the ideational factors expressed by the sectoral national and especially local labour organisations to which they were connected, inspiring their collective bargaining approach. The fear of losing jobs led the local union organisation to pay strict attention to the needs expressed by auto firms. However, as seen, this union framing was significantly affected by the constraining institutional context (more competitors some of which non-unionised, market regulation and the absence of sector-wide national agreements).

5.2 Workload

The level of saturation time, namely, the planned employee working time within cycle times, affected the workload along assembly lines. In both plants, lean production boosted the elimination of any waste and thereby also the increase in saturation time through its concept of continuous improvement. Again, however, the exact results differed between the two plants.

In the Italian plant, there was a saturation time of 82 per cent within a cycle time of 57 seconds, meaning that workers were expected to work 47 out of 57 seconds, while in the US factory, saturation time was equal to 90 per cent within a cycle time of 53 seconds, which meant 48 seconds of work out of 53 total seconds. If we compare the two levels of saturation time within a day, the Italian workers had five extra seconds of non-work within the saturation time compared with American employees (10 vs. 5). If we multiply this difference by one hour and then by eight hours, we see that Italian workers had approximately 30 more minutes of non-work per day. This difference was corroborated by the interviews and statistical data collected, and American workers were aware of having a much higher workload (Table 4).

In the Italian factory, managers explained the importance of remaining competitive with the other supplier and of maintaining satisfactory profit margins in spite of Fiat's periodic requirement to lower the price of the supplied module. This need was augmented by the fact that the company was forced by Fiat to buy the most important and costly components of the products from specific suppliers, hence preventing its raising of the supply price. Managers responded to these institutional constraints by constantly seeking to increase saturation through the implementation of continuous improvement activities to improve the efficiency of the assembly line. However, while they did not have a specific goal to achieve, their calculation was contested by the RSUs, who, at the time of the research, were in the process of asking for a reduction. The RSUs applied the information and consultation rights that the CCNL (which mostly incorporated the related legislation) foresaw in the field of employee health and safety along with their organisational strength to bargain for a reduction in the level of saturation time. Although the process of negotiation was still in progress, it was clear that

Table 4: Workers' answers to the question concerning the level of workload, = 0.048 (Italy) and = 0.066 (United States)

Category	Italy (no. of responses)	Italy (%)	United States (no. of responses)	United States (%)
Low	28	22	3	3
Medium	57	46	30	27
High	40	32	77	70
Total	125	100	110	100

saturation time was not going to be increased. In this case, the RSUs did not refer to issues of competitiveness or job security and framed the increase of saturation time as an employer's attempt to diminish employment conditions for the sake of profitability.

> Managers should calculate saturation time differently. For us, the pace of the production of the assembly line is too high, which is what some workers told us. We asked the management for a meeting to discuss this matter, and we are still waiting. […] If you give more mandatory overtime and less breaks, then employment becomes exploitation because the market is the master. (FIOM RSU)

In the US plant, managers were equally subject to economic pressures for efficiency due to the need to be competitive with other suppliers and the importance of keeping profit margins in spite of car manufacturers' requests for price reduction. As in the Italian context, the American company was forced by its customers to rely on specific suppliers for the most important and costly components of the products. Unlike in the Italian case, the US factory had more competitors (including union-free plants in the area). They used constant practices of continuous improvement, such as *kaizen* activities, to ensure that the related saturation time remained high in order to achieve satisfactory profit margins. The management of the plant established and achieved a goal of 90 per cent saturation time. The plant's agreement indicated that shop stewards had to be involved within decision-making processes concerning issues and practices related to employee health, which encompassed the calculation of saturation time. However, to increase job security by supporting company's operations, the shop stewards did not leverage these contractual provisions to oppose continuous improvement activities and its related target as long as employee health was not threatened.

> I do not have anything against managerial activities that increase efficiency provided that they do not threaten employee health. All the activities that improve our competitiveness are welcome since they can increase employee job security. […] Nearly one year ago, one of our company's plants in this area was closed. I do not know why, but people there were asking for more money and contested the workload. (UAW Shop Steward)

6 DISTINCTIVE EMPLOYMENT ARRANGEMENTS

6.1 Teamwork, training and workers' relations with supervisors

In both factories, teams were formed and rendered responsible for the quantity and quality of production. However, they were not responsible for fixing defects or carrying out minor maintenance despite the presence of training funds in both contexts that could be used to train workers in these areas. In the Italian case, these funds were available as they were financed by the companies themselves, but they required the RSUs' consensus in order to be used. In the plant, there was a lack of consensus about because the unions aimed to give workers the opportunity to acquire skills that would enhance their value in the labour market, whereas managers only wanted to train specialised employees. Thus, the funds were not used by the firm eventually. In the United States, funds were subject to public competition but were nevertheless obtainable, as the plant had demonstrated in the past. At any rate, the idea of searching for these funds was not proposed neither by managers nor by the union.

Quality standards were evaluated positively, but managers aimed to improve them given the institutional constraints imposed by the sanctions applied by customers for product defects. However, in both plants, quality controls and minor maintenance were exclusively assigned to specialised employees, as was the case in the traditional

Table 5: Workers' answers to the question: 'How much mutual collaboration there is between you and your supervisor/team leader?' = 0.049 (Italy) and = 0.066 (United States)

Category	Italy (no. of responses)	Italy (%)	United States (no. of responses)	United States (%)
Low	32	26	57	52
High	91	74	52	48
Total	123	100	109	100

Taylor-Ford factories. This occurred in spite of the fact that assigning such tasks to teams would help improve quality and meet the achievement of just-in-time goals by steadying the production flow. In this case, it would not be necessary to wait for the intervention of specialised personnel, causing delays in production. In both cases, neither the RSUs nor shop stewards asked for different teamwork regulations. The constitution of teams linked with lean production was not viewed by them as an opportunity to increase employee skills and autonomy by leveraging the institutional resources available to them, especially in the Italian case.

Given the absence of teams endowed with autonomy, it is not surprising that team leaders (Italy)/supervisors (United States) did not carry out leadership approaches consisting of training and coaching activities aimed at increasing employees' autonomy. In spite of this similarity, collaboration and mutual support between workers and team leaders/supervisors were conspicuously different between the two plants, as revealed by the interviews and confirmed by the quantitative data (Table 5):

The interviews revealed that the key difference between the two plants lay in the friendlier behaviour of the Italian team leaders, who avoided overly strict control and were tolerant of workers' mistakes. The approach followed by mid-level managers aimed to create a positive environment and to avoid issues with the RSUs whose action affected this managerial behaviour. As a matter of fact, the latter leveraged workers' legal protection against disciplinary sanctions and dismissals in a confrontational manner, in line with their adversarial approach, if employees were disciplined.

> The RSUs contest disciplinary sanctions. We are very quiet about that; we sanction when there is no alternative. The RSUs begin with the assumption that workers are always right. (Italian Production Coordinator Manager)

On the other hand, US supervisors were very strict and often imposed disciplinary sanctions on workers, using the concept of teamwork to pressurise them. The shop

Table 6: Employees' answers to the question regarding their agreement/disagreement with the sentence 'I think that my opinions and those of my colleagues are usually listened to by managers', = 0.062 (Italy) and = 0.068 (United States)

Category	Italy (no. of responses)	Italy (%)	United States (no. of responses)	United States (%)
Agreement	55	53	49	46
Disagreement	51	47	57	54
Total	106	100	106	100

Table 7: Workplace unions' framing of lean production and the social performance of the system in the two plants in each organisational and human resource management variable considered within traditional and distinctive employment arrangements

	Italian plant	US plant
Institutional resources for the union in terms of collective bargaining systems, labour laws and the characteristics of business relations with customers	Significant	Low
Union identity	Adversarial under a system of power relations with the firm	Collaborative with employers under a concessive collective bargaining approach
Workplace unions' framing	Threat to workers because of worsening their employment conditions (managers emphasise work intensity)	Useful as framed by managers (emphasising work intensity) to strengthen workers' job security
Traditional employment arrangements		
Working time	Not long; traditionally regulated	Long; unregulated
Workload	82% of saturation time	90% of saturation time
Distinctive employment arrangements		
Teamwork	No quality and maintenance tasks assigned to workers; absence of team leaders' leadership approach	No quality and maintenance tasks assigned to workers; absence of supervisors' leadership approach
Direct participation	Suggestion box on safety	Kaizen sometimes involving workers

stewards contested these sanctions thus acting against managerial decisions and were almost always able to reduce them by following the grievance procedure established by the plant's agreement. This union action of protecting workers from disciplinary sanctions leveraging contractual provisions limited the outcomes of managerial pressures on workers for productivity, although the issue of supervisors' severity in controlling employee performance persisted.

> The first issue in this factory is that supervisors are too rigid in giving sanctions. If you make a mistake after many hours of working on an assembly line that is constantly changing and you have little training, you cannot blame the worker. (UAW Shop Steward)

6.2 Workers' direct participation

The tools of direct participation that were adopted were limited, reflected by one practice per factory in addition to some informal activities that were manifested on the shop floor. A suggestion box concerning the health and safety system was implemented in the Italian case (with the RSUs' involvement), whereas in the US factory, *kaizen* activities were adopted unilaterally by managers. This unilateral application explains why the American workers expressed slightly more negative opinions regarding the possibility of having their suggestions considered by managers relative to the Italian employees. Nevertheless, given the application of only one participative practice confined to the protection of workers' health and safety, it is not surprising that half of the Italian workers expressed the belief that their suggestions had often not been listened to by managers (Table 6). It should be noted that the feeling of being listened to is not the same as workers' ability to influence working conditions.

In the Italian case, managers made use of a suggestion box with the aim of protecting employees' health and reducing the costs resulting from injuries. The RSUs accepted the tool because safety was considered one of the few subjects where managers and workers had converging interests but asked the company to be involved in its regulation. They wanted to ensure that employees would be informed in a timely and professional manner about the suggestions that were advanced, a request that the managers accepted. The safety-suggestion box had some impact, with 70 employee suggestions out of 96 (i.e. 73 per cent) being implemented by the management within a three-month period, according to analysis of the plant's documents. Moreover, both the managers and the RSUs evaluated the practice as being satisfying.

In the US plant, the formal policy for workers' involvement was constituted by *kaizen* activities, which were planned and implemented by managers in an effort to supposedly improve both saturation time and employees' working conditions. Shop stewards did not oppose this practice and appraised it as satisfying. However, given that the managers had the unilateral power to implement this practice, *kaizen* activities were applied without employee participation when they aimed to increase efficiency by cutting personnel. Moreover, managers admitted that these activities of continuous improvement had the primary aim of increasing employee saturation rather than of improving working conditions based on workers' suggestions.

> Theoretically, employees can also suggest areas for improvement. However, it is practically impossible for suggestions to come from hourly workers because for them, kaizen means making their job harder or cutting people. (US Kaizen Manager)

These outcomes also derived from union framing. Labour organisations were not proactive in putting forward other practices of direct participation in either plant. Italian

unions did not advocate lean production positive-sum game practices that direct participation practices can represent. The US union, on the other hand, followed a passive approach, leaving the initiative to managers. In both plants, that occurred despite the satisfying outcomes achieved by the participative practices implemented according to the social parties and the fact that numerous managers referred to the importance of employee involvement. Thus, the RSUs and the shop stewards could challenge managers on this subject to verify if their intentions were real or rhetorical given the implementation of very few related practices.

7 DISCUSSION AND CONCLUSION

This article has explored variations in the implementation of lean production and consequences for social performance. The systematic comparative analysis has revealed that the way in which workplace unions frame lean production, which is affected in a relevant way by institutional factors, helps explain the results, as synthesised in Table 7. Therefore, the novel application of this theoretical framework to explaining the variance observed in lean production social performance has been proven valid. The initial hypotheses concerning the two plants are thereby substantially confirmed. In detail, union framing is shaped by the recursive interconnection between workplace unions' identities on the one hand, affected by the approaches towards employers followed by sector-specific national and especially local labour organisations, and on the other the availability of institutional (constituted by collective bargaining systems, labour laws and inter-firm business relations) as well as plant-level organisational resources. Particularly, institutional factors are relevant in affecting union framing thus not only confirms their importance for union action (Colvin and Darbishire, 2013; Doellgast, 2010) but also gives leeway to their ideational factors to decide if and how to substantiate different institutional factors.

In the Italian plant, the distinctive employment arrangements and the innovative content of the traditional arrangements that are seen to shape the lean production model were not applied. Managers (albeit less strongly than in the US case) framed such a system by emphasising the speed-up aspects of the model (connected for instance with just-in-time and improvement activities) integrated by limited policies of workers' participation. The Italian union (FIOM was highly prevalent in the factory) framed the application of the model as a threat to workers within an adversarial union position towards the employer on the grounds of which collective bargaining was largely conceived as being a zero-sum game. As such, it resisted the flexibility required by the management, in the form of higher work intensity, but without attempting to challenge managers regarding the potential participative arrangements and the possibility of innovatively regulating traditional subjects. The adversarial principles expressed by workplace labour representatives were influenced by national and especially local union ideational factors (reflecting the national ones) given their interconnections, which were in turn imbued with the characteristics of the industrial relations developed with the auto maker.

However, in order to explain the results, adversarial union identity needs to be viewed in recursive interplay with the different resources available to labour organisations. The Italian context provides unions with significant institutional resources that are leveraged along with organisational strength to resist the negative aspects of lean production. Specifically, collective bargaining systems based on the 'dual level' of national and plant-level collective agreements appeared to protect workers and

facilitated union action. The system does not require workplace unions to be strongly focused on a plant's conditions, which can encourage them to engage managers in jointly governed organisational innovations. At the same time, non-market regulation with Fiat, the national agreement and labour law and (to a lesser extent given the enforcement of the CCNL and of labour laws) the absence of non-union competition reduce unions' fears of losing businesses that would threaten workers' job security due to market pressures.

On the other hand, institutional and organisational resources influence but do not determine the framing of lean production, thereby giving leeway for the union to decide if and how they should be substantiated. Indeed, workplace union ideational factors did not lead it to leverage the institutional factors (such as quality requirements from customers, the CCNL provision for company-level bargaining for working time and veto power concerning the use of training funds) that can encourage an alternative framing of lean production through the pursuit of differently regulated traditional employment arrangements and the adoption of distinctive employment practices. For instance, while the 'dual level' of collective bargaining does not lead social actors to strictly consider a plant's conditions, important spaces are made available to share plant-level modifications over employment practices.

In the US plant, managers frame lean production by emphasising the speed-up aspects of the model and their hierarchical power in order to increase plant's competitiveness. The union follows this managerial frame of lean production by adopting a concessive strategy of collective bargaining in order to strengthen employee job security. As a result, a type of 'low-road lean production' has emerged. Workers must bear the burden of very stressful working conditions, and distinctive employment arrangements are either not strongly implemented or come with some negative consequences (e.g. for teamwork). The union identity that underlies the need for safeguarding job security and supporting a company's competitiveness under plant-level collective bargaining is conducive to this strategy. In this case, workplace union identity also appears to be affected by the sectoral labour organisations' ideational factors developed at the national and particularly at the local level (following the national strategy), with which the plant-level union collaborates.

Again, this union framing of lean production is influenced by the institutional context that in this case provides limited resources thus acting as constrain to union action. It is influenced because (from the institutional viewpoint) the American 'disorganised decentralisation' of the collective bargaining system, combined with the presence of non-unionised competitors in a situation of market-oriented business relations with car makers, fails to support union action for workers' protection or joint innovation with managers. On the contrary, these institutional factors push the regulation of lean production practices downwards. However, union ideational factors play a role in this case, too. The concessive workplace union identity interwoven with national and especially local influences has not stimulated the union to use the power resources (limited as they are) to bargain for better employment conditions. In this context, union presence remains largely prevalent in the first-tier supply sector; there are (although few) plant-level contractual provisions to leverage; product quality issues are relevant; and market-oriented business relations are endowed with some stability, as demonstrated for instance by the long-term relationship with Ford. In addition, workplace unions can draw on a high level of organisational power. Therefore, these power resources can be used by unions at least to limit the coercive dimension of lean production.

This explanation, combining union identity in recursive interaction with institutional and plant-level organisational resources, can be applied to other institutional contexts and plants provided that they are well unionised and that supply chain relations significantly affect a plant's operations. These conditions are largely pertinent to the manufacturing sectors and particularly the auto sector as regards the relevance of supply chain relations. However, their importance, although existing in different forms in the case of supply chain relations (Ellram *et al*., 2004), cannot be excluded in the service sector, where lean production is increasingly commonplace (Bamber *et al*., 2014), potentially expanding the applicability of the theoretical framework. The characteristics of the different elements, hence their recursive interconnections and subsequent outcomes for workers, can differ both among and within countries. However, it is the deconstruction and holistic consideration of the recursive interplay between these aspects that can help to explain why workers experience different employment conditions under lean production.

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