**CHAPTER 5**

**The Lean Labour Process:**

**Global Diffusion, Societal Effects, Contradictory Implementation**

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In 1930 the founder of Toyoda Automatic Loom Works, Toyoda Sakichi, instructed his eldest son, Toyoda Kiichirō, to research the auto industry with a view to entering it. In 1933, Kiichirō announced that the company would begin making cars, stating: “We shall learn production techniques from the American method of mass production. But we will not copy it as is. We shall use our own research and creativity to develop a production method based on our own country’s situation” (quoted in Ohno 1988: 91). That situation included a small market that could not justify huge volumes with dedicated machinery, coupled with severe resource constraints. Their goal was to develop a production system based on lower volumes with low inventories. Toyota didn’t implement its first compete just-in-time system until 1958 and was not able to fully debug its *kanban* (continuous flow) system until 1962, after which it was adopted companywide (Tolliday 1998).

This model became the Toyota Production System. Core elements of the Toyota system were widely adopted across Japanese industry, although companies such as Nissan, Honda, NEC and others adopted the practices selectively and integrated them into their own systems (Boyer 1998, Freyssenet et al. 1998, Kenney and Florida 1993).

By the 1980s, the Toyota Production System had been codified into a production standard that had diffused far beyond Japan, divorced from Japanese HRM practices such as lifetime employment. This model was dubbed “lean production” by MIT researchers because it uses less inventory, labor and space than traditional Fordist manufacturing (Krafcik 1988). The core model includes just-in-time production (demand-driven, flow production with low inventories), standardised work,teamwork with employee involvement, and continuous improvement. By the the 1990s, lean had become the predominant model for manufacturing across the globe (Elger and Smith 1994c, Kochan, Lansbury and MacDuffie 1997, Oliver and Wilkinson 1992) and subsequently has spread into services, including healthcare, public administration, education and other sectors.

Now, there are a range of specific lean practices that are variably emphasized across sectors, such as takt time (common in auto assembly, uncommon in metal fabrication shops), cellular layouts (common in metal fab shops, uncommon in auto assembly), use of *kanban*-based pull systems,and others. But the core model of just-in-time production, standardisation, teamwork and continuous improvement has diffused broadly, including specific practices seen to be widely applicable across organizational and technological contexts such as value stream mapping, continuous flow, quality at the source, 5S standardization, setup reduction and continuous improvement (*kaizen*) practices.[[2]](#endnote-2)

In this chapter we develop a labor process account of lean production. Rationalization within production is to speed-up accumulation, moving capital though its cycle more quickly and efficiently. Our approach to leanemphasises how both managers and workers face contradictory pressures, how the dominance of leading firms and countries provides the basis for global production models, and how, as these models diffuse across countries, national institutions shape how they are implemented.

Following the influential work of Braverman (1974), labor process theory has been widely seen as holding that deskilling and the degradation of work are overriding imperatives of capitalist management. And many scholars working within or close to the labor process tradition have argued that lean production is simply the newest form of Taylorist deskilling and work intensification (Carter et al. 2013b, Danford 1999, Graham 1995, Parker and Slaughter 1995, Rinehart, Huxley and Robertson 1997, Rothstein 2016, Stewart et al. 2009).

We agree that lean production can be a very effective system for deskilling and work intensification. But we do not think these outcomes are inherent to lean nor, at a theoretical level, that a capitalist control imperative necessarily leads to a uniform process of deskilling.

In our reading, while Marx ([1867] 1990) did place strong emphasis on deskilling as the historically dominant process and tendency of capitalist management, his argument was more nuanced and dynamic. The structural contradiction between the forces and relations of production animates history and continuously transforms the labour process and the functions of the worker. Economic development occurs through stages, and in later stages of capitalist development, there will be an increasing contradiction between the tendency to deskill and the need for multiskilled, flexible labor. Marx ([1867] 1990: 618) anticipated an increasing need for “the totally developed individual” who is “available for the different kinds of labour required of him.” He also saw capitalist development, including general education, as providing workers with the capabilities for self-management.[[3]](#endnote-3) At the same time, fragmented detail work can continue to narrow the intellectual horizons of workers, and replacing male skilled labour with unskilled child and female labor, remains an economic attraction of capital, while social movements in society start to limit such inclinations (Smith and Thompson 1992).

We work within the vein of labor process theory that takes its lead from this reading of Marx, emphasizing contradictory pressures facing managers regarding whether to emphasize deskilling versus multiskilling (Adler 1990, Adler 2007, Cressey and MacInnes 1980, Elger 1979, Littler 1982, Thompson 1983). And we note that several scholars working within or close to the labor process tradition have argued that under lean there can be real forms of multiskilling and worker participation in decision making (Adler 1993, Delbridge 2003, Elger and Smith 2005, Jürgens 2004, Lowe, Delbridge and Oliver 1997, Oliver and Wilkinson 1992, Stanton et al. 2014, Vidal 2007a).

Further, most labor process theory has been inadequately attuned to comparative analysis and to the role of national institutions in shaping labor process dynamics (a notable exception in the early literature is Littler 1982). Seeing the importance of institutions, we adopt the system, society and dominance (SSD) framework, which breaks down the sources of adoption and resistance to production models by separating three forces (Delbridge 2003, Elger and Smith 1994b, Smith and Meiksins 1995, Vidal and Hauptmeier 2014).

While the emergence of global models – Fordism and Taylorism followed by the Toyota Production System – act as forces for convergence in the labor process by providing a model of perceived best practice, other forces generate variations around the core model. The basis for such variations lies in the contradictory nature of the capitalist labor process as such: managers face competing pressures to deskill labor versus harnessing worker’s creativity and skill via training and empowerment. Individual managers respond differently to these conflicting pressures. And the power of organized labor can push managers and organizations in the direction of training and empowerment, both at the level of individual organizations, via local unions and works councils, and at the level of sectors and countries, via wider employment relations institutions (Doellgast 2012, Krzywdzinski 2017, Turner 1991).

In this chapter we begin with the diffusion of lean from Japan. We start with different accounts of diffusion and then articulate the SSD account in detail. Next, we examine the contradictory and contested implementation of lean within organisations. Finally, in service of understanding and explaining variation in lean labor process regimes, we develop a typology of lean production regimes.

ACCOUNTS OF THE DIFFUSION OF LEAN

We see three accounts of diffusion. First, there is what can be called a prescriptive and universalist approach, which takes lean as the one best way, akin to earlier management models, such as Taylorism and Fordism. This view assumes an inherent and plain advantage to lean such that firms will be forced, out of competitive survival, to adopt this model (Kochan, Lansbury and MacDuffie 1997, Liker, Fruin and Adler 1999, Liker 2004, MacDuffie and Pil 1997, Oliver and Wilkinson 1992, Womack, Jones and Roos 1990). Scholars in this group have shown that a core lean production model can be widely transferred across national institutional contexts, independently of Japanese HRM practices, without a negative impact on performance. Critically, this view sees best practice as requiring a complementary package of lean practices, and thus it predicts broad convergence in work organization as the world-class production model diffuses across countries and sectors.

The strength of this view is that lean has in fact been adopted across the globe in manufacturing and other sectors, with leading corporations, industry associations and consultants all pushing a nearly identical model of lean consisting of complementary practices intended to be implemented as a package.[[4]](#endnote-4) Problems arise, however, in assuming that the broad agreement on this complementary package of lean practices will necessarily translate into its universal adoption. Such a view discounts both the role of institutions and labor process dynamics. This view fails to provide much purchase on the reality of institutional and organizational diversity.

Second, and in direct conflict with the above approach, there is what can be called an open and contingent method, which considers diffusion not as a standardising force, producing the same effects everywhere, but as a force that fits into pre-existing divergences between industries and countries, and as such reproduces continued divergence through adaptation and hybridization (Boyer 1998, Freyssenet et al. 1998, Mishina 1998, Tolliday et al. 1998). Such hybridization is seen as (a) a source of innovation and (b) inevitable, given the need for a production model to fit into distinct institutional contexts. It assumes country (and sector) institutional factors are deeply embedded, robust, diverse and not vulnerable to a radical conversion into a standard model. Hence lean, like all production models, is an open, promiscuous concept.

The advantage of this approach is that it takes seriously the power of institutions across sectors and societies to continue to produce meaningful differences, not just in HR and social outcomes, but also in the evolution of models as they are adapted to fit local contexts. But it overestimates the innovative element of diffusion and fails to appreciate the extent of imitation within organizations. It cannot easily explain the global diffusion of a universal model of lean.

Third, there is the approach we adopt here: the SSD approach. Applying this framework, lean contains the three elements. The *system effect* of capitalist accumulation, valorization and profit pressures highlight continuity with Fordism and Taylorism and help explain the durability of lean as global best practice despite the protestations of contingency theorists that there is no one best way. The *dominance effects* of Toyota, Japan and a universalized model of lean production emerged in opposition to other aspirant models (e.g. the sociotechnical systems/Volvo model of self-directed teams, the German model), challenged them and became crowned as global best practice.

*Society effects* highlight the continuing imprint of national institutions on how the universal model of lean gets adapted. For example, in countries with powerful unions, codetermination institutions, and robust vocational training systems, such as Scandinavia and Germany, lean tends to be implemented with more highly skilled workers and/or substantive forms of worker participation than at Toyota or in Japan more generally (Benders and Van Bijsterveld 2000, Ingvaldsen, Holtskog and Ringen 2013, Jürgens 2004, Krzywdzinski 2017). Scandinavia tends to have higher levels of substantive participation by shopfloor workers than Germany, due to deep traditions of worker participation and labor-management cooperation. However, as discussed in more detail below, there remain substantial variations within countries.

Despite the wide diffusion of a universal model of core lean production practices, there remains extensive variation within countries and sectors. This variation is produced both by institutions (national and sectoral) and labour process dynamics, including managerial orientations, workforce orientations and labor organization, and resulting forms of negotiation and accommodation (Bélanger and Edwards 2007, Krzywdzinski 2017, Smith 2015, Thompson and Smith 2009, Thompson and van den Broek 2010).

SYSTEM, SOCIETY AND DOMINANCE EFFECTS IN THE DIFFUSION OF LEAN

Lean production became absorbed into system imperatives that make it standard practice. The agency and influence of leading firms, associations and countries reinforce standardizing system effects. Yet, national institutions can embed lean in divergent ways.

The SSD framework helps both with the history and the future development of lean practices. In looking to the past to explain why lean developed in Japanese society we are confronted with the dependent positon of the society post-war, the inherent shortages and restrictions that meant a simple imitation of Fordist practices was not possible, and the autonomy and character of large companies within the Japanese political economy that allowed for sustained experimentation. The closed nature of the economy, but the learning from the US through military occupation, created specific conditions for the development of the particular recipe of lean.

The nature of Japanese employment relations in large firms meant that management cadres built their careers within the firm and as such Japanese production expertise relied on tacit knowledge displayed in the day-to-day practices which kept knowledge within the firm. In stressing the importance of waste reduction, Toyota engineers were dealing with real pressures in the company and society, and hence innovating in a specific context. The lean model has its roots primarily in Ohno’s (1988) programme for the rationalization of production developed in the 1940s designed to cope with shortages of capital and materials, including the specification of standard tasks and times, Taylorist task fragmentation and standardisation, multi-machine manning and experiments in JIT assembly. It also involved a growing role for individualized merit assessments in determining pay and promotion.

In the 1960s, a period of rapid expansion and considerable labour turnover, all these initiatives were pushed further and combined with a belated preoccupation with systematic quality control (QC). This resulted in a supervisor-orchestrated pattern of intense flexible labour, and a dynamic of productivity gains driven through the management hierarchy to the work group level by payments for continuing above-norm improvements (Cusumano 1985, Ishida 1986, Okayama 1986). By the early 1970s these features had been formalized into what became known as the Toyota Production System. This was, as noted by Elger and Smith (2005: 21) “…very much management dominated, but with a more subtle integration of workers through the institutionalization of merit pay and the extension of QC activities, as the proportion of temporary and seasonal workers among final assemblers fell rapidly (Gronning 1997, Ishida 1986, Shimizu 1998, Tolliday 1998, Udagawa 1995).”

The TPS was again reformed in the 1990s in the context of trying to attract workers into the factories in a period of full employment, and reforms included “abolishing the traditional pay system…with its tight link to hard productivity indicators…and the introduction of career paths based on competency appraisals…” (Jürgens and Krzywdzinski 2016:11). Diffusion of the TPS within Japan was aided by agencies external to the firm, such as the Japanese Union of Scientists and Engineers, which encouraged the discussion and dissemination of best practice across different firms and sectors making Toyota innovations more widely available in Japanese society (Cole 1989, Tsutsui 1998).

The global hegemony of the US and Fordism, moreover, ensured that there was little interest in Japanese practices in these early years as it was assumed that Japanese manufacturing industry was bound to eventually follow the dominant US model, leaving Japan (especially Toyota) to innovate over a long period of time and hence build a robust alternative to classical Fordism behind the back of the US. But of course, when the Toyota Production System became recognised as genuinely different from and innovative to Fordism, it was a time when Japanese society was in a different place, as the second largest economy in the world, and the US was also in a different place, with their manufacturing challenged from Europe, rising BRICs and Japan. The societal jig-saw was different, and the economic or system effects were different, as the US pressed tariffs on Japanese goods encouraging internationalisation of the Japanese firm and as transplants or reproduction plants the MNCs acted as an agency of diffusion. Japanese firms established overseas subsidiaries and selectively transferred work and employment practices (Elger and Smith 2005).

Retrospectively we can identify a distinctive Japanese production regime, but this history and must be set in the context, as it is not a closed system. Furthermore, internationalization processes are also formed historically, and the operations of subsidiaries must be situated in their own evolving contexts (Elger and Smith 2005: 22). Selective transfer of Japanese practices was partly driven by cost considerations (Dedoussis and Littler 1994) - with expensive practices left at home - but also host society considerations, assessing how the wider social, institutional, and economic contexts relate to the practices that are being transferred.

Toyota replaced Ford and GM as the biggest auto producer, forcing them and others to seek to learn from them and embrace ‘Japanese’ methods or Toyotaism, throughout the 1980s. Elger and Smith (2005: 67) note that learning from Japan was closely linked to the economic power of the country which was often simply reduced to superior Japanese ideas on production and employment relations. Through processes of borrowing some Japanese terms were kept (*kaizen*, *kanban*) while others were neutralized by more generic or technical terms, such as ‘lean production’ or ‘TQM’ or ‘continuous improvement’, which were created by academics and consultants for their own interests and to aid the spread of the message through a more neutral language.

We can see that dominance effects (the strength of the Japanese economy as well as the distinctiveness of Toyotaism) helped disseminate these new manufacturing standards as a distillation of the societal and systemic elements through the process of diffusion. This is clear in the debate about Japanese production innovations, but it was also evident in earlier debates on Taylorism, where an initial resistance in the UK was framed by the American origins of the practices which were deemed inappropriate in the British context where labour, employment and business practices were wedded to smaller markets and craft labour (Merkle 1980, Vidal 2015). But with diffusion though management consultants (Littler 1982), this American model was transformed it into a widely perceived best practice, which was seen as a ‘system’ requirement in other economies, who associated it (and Fordism) as explaining the rise and dominance of the US economy. Analytically separating the three elements of Taylorism and Fordism – those specific to the US, those with wider system reach and those linked to a dominant economy, only becomes clear when other dominant models arise – as in the Toyota system - that begin to make clear what to take and what to reject from American production models (Smith and Meiksins 1995: 263–4).

Fordism spread across the OECD countries, producing both cheap durable goods and – based on coordinated wage bargaining with powerful unions – effective demand in the form of high wages. As new forms of more flexible production emerged in the 1960s – driving rather than responding to fragmenting markets – rigid Fordist production went into crisis. Over the 1970s and early ‘80s there were competing models of flexible production: the Swedish (Volvo) model, the German model and the Japanese (Toyota) model. By the end of the 1980s, Japanese lean production emerged as the victor, becoming perceived as the universal model of best practice in postfordist manufacturing – including in Sweden and Germany – and increasingly spreading into services.

Lean became packaged by leading multinational corporations and consultants into a template of best practice. Although lean is often rebranded in proprietary terms – such as GM's Global Manufacturing System – a template of core practices has spread across the globe. This template includes demand-driven, flow production, emphasizing process standardization, economies of flexibility and continuous improvement, using multiskilled workers empowered to engage in decision making and problem solving. Yet, this model may be adapted within particular institutional contexts or otherwise selectively adopted.

National institutions and traditions can impact how the lean model is implemented. For example, the German codetermination and vocational training systems have led a higher percentage of highly skilled workers in many companies that have adopted lean (Jürgens 2004). And a tradition of teamwork (*Gruppenarbeit*) associated with humanization of work programs (and inspired by the Swedish example) has resulted in teams with certain levels of self-management, although there is great variation across firms (Benders and Van Bijsterveld 2000). Self-management tasks at one major German auto company include responsibility for training, job rotation and materials planning (Krzywdzinski 2017). Similarly, in Norway

Early adoptions of Lean bear the imprint of the Scandinavian working life model (Gustavsen 2007) reflecting strong traditions of worker participation and cooperative industrial relations. … From the onset then, Lean was enacted in a worker-friendly fashion and framed as an instance of how management and unions could cooperatively develop productive and humanly rewarding organizations (Benders, van Grinsven and Ingvaldsen 2018: 9).

But deep traditions of autonomous teamwork and strong codetermination institutions do not guarantee cooperative outcomes or happy workers. Oudhuis and Tengblad’s (2013) study of three mechanical engineering plants in Sweden documented the frustration of workers as the implementation of lean resulted in reduced autonomy and narrowing of skills used. However, they note that due to institutionalized sources of worker power, these workers retained a level of participation higher than is common in Japan, the UK and US and did not experience such extreme work intensification as in the latter countries.

More broadly in Sweden, the implementation of lean has been accompanied by “wider work content, cooperation and influence, as well as more participation in problem-solving activities among the workers,” although there has also been work intensification (Johansson, Abrahamsson and Johansson 2013: 454). In 2008, the largest union, IF Metall, launched a “sustainable work” program intended to increase labor-management cooperation, skill development and worker participation while limiting job rotation so that no more than 75% of work consists of repetitive tasks.

In the US, although there is robust evidence of work intensification from studies of US auto assemblers, there is also evidence of substantive forms of participation with limited work intensification in supplier factories (Vidal 2017). This substantive participation within lean also has an institutional basis: a long history of worker participation programs and joint labor-management committees in US industry (Appelbaum and Batt 1994, Fantasia, Clawson and Graham 1988, Jacoby 1983). But lean practices are often implemented selectively, with some – perhaps most – managers opting for work intensification over worker empowerment.

In the most comprehensive study of the implementation of lean in the BRIC auto industry, Jürgens and Krzywdzinski (2016: 11) noted that that while VW is now the biggest car company, it was Toyota that was the model for innovation in the sector and beyond. Car plants around the world emulate TPS. In Germany, VW “expressly modelled its production system on TPS” both at home and in its overseas plants around the world. The same can be said for Ford and GM (Elger and Smith 1994a). The spread of the TPS was produced through global car companies, management consultants and engineers. *The Machine that Changed the World* (Womack, Jones and Roos 1990) sold in huge numbers for a social science book and was influential on the academic, consultancy and business community. It provided many international consultancy companies with the tools to spread lean, and later variants of this package, to companies around the world.

Standardisation of the core production model is central to lean and was the norm in its diffusion “due to the influence of the Toyota Production System, which all our manufacturers sought to align themselves with in various ways’ [where this involved change to existing practices]…the organizational changes have often been carried out in cooperation with international HR consultancies” (Jürgens and Krzywdzinski 2016: 314). But they also stress that human resource management practices and work culture varied within countries, reflecting national and company diversity.

Diffusion of lean has moved beyond autos and manufacturing. It is possible to find papers on a range of sectors including *civil service* (Carter et al. 2011, Carter et al. 2013a, Carter et al. 2013b, Procter and Radnor 2014), *baggage handling* (Alsyouf et al. 2018); *higher education* (Sunder M. and Antony 2018, Thirkell and Ashman 2014); *road building* (Tezel, Koskela and Aziz 2018); *retail* (Kroes, Manikas and Gattiker 2018); *pharmaceuticals* (Garza-Reyes et al. 2018); *trucking* (Liker and Karlin 2018); *information technology* (Bell and Orzen 2016); *logistics* (Klug 2018); and even *cities* (Herscovici 2018).

CONTRADICTORY AND CONTESTED IMPLEMENTATION OF LEAN

In addition to the effects of national and sectoral institutions, there remains widespread diversity in how lean is implemented even within the same sector in the same country. To explain this variation we emphasize management satisficing in the face of contradictory pressures. Vidal (2019) has distinguished a set of competing pressures facing managers from a set of competing pressures facing workers, referred to, respectively, as the management contradiction and the workforce contradiction.[[5]](#endnote-5)

On the management contradiction, even in the era of Fordism, when the basis of efficiency was economies of scale and automation, and Taylorism was the primary labor management model, deskilling was always necessarily incomplete. Managers experienced a tension because production always depends to a certain extent on the tacit skills and cooperation of labour (Edwards 1979, Friedman 1977). In the postfordist age, where the basis of efficiency is economies of scope and flexibility, this tension becomes acute. With lean production there is high interdependence across operations hence sensitivity to disruptions, which requires ongoing problem-solving processes involving the knowledge and experience of all shop floor actors.

As extensive research has documented, managers often emphasize work intensification instead of worker empowerment, offering limited opportunities for worker participation (Carter et al. 2013b, Danford 1999, Graham 1995, Jürgens and Krzywdzinski 2016, Parker and Slaughter 1995, Rinehart, Huxley and Robertson 1997, Rothstein 2016, Stewart et al. 2009). “In many companies, continuous improvement processes (CIP) are rituallistically ossified and little attention is paid to the contribution of workers” (Butollo, Jürgens and Krzywdzinski 2018: 9). In our analysis, establishment-level variation on these outcomes stems from the fact that managers face contradictory pressures between empowering their workers via multiskilling and substantive participation versus disciplining workers via standardization, deskilling and work intensification.

On the workforce contradiction, it has been observed that workers are often hesitant to take on increased problem-solving and decision-making responsibilities. This may come from a distrust in management’s motives and skepticism of management fads of the month (Delbridge 2003, Vidal 2007a, Vidal 2007b), an experience of such responsibilities as stressful (Bouville and Alis 2014), or a realization that workers’ ideas are being used to speed up their work (Rinehart, Huxley and Robertson 1997). At a more fundamental level, worker reticence to embrace increased responsibilities (or change more generally) stems from the fact that they are wage labourers subject to managerial authority, with management ready to exercise a veto or remove (partial) worker empowerment at any time – in short, that the labour process remains alienating (Friedman 1977). In such an alienating context, workers will often cling to, and even tenaciously defend, existing routines (Willmott 1990). This contradiction between (partial) empowerment and (continued) alienation drives scepticism, reticence and resistance toward the former.

In response to the management contradiction and the worker contradiction, managers often satisfice, settling for “good enough” rather than pushing ahead in pursuit of the most dynamically efficient and flexible organizational form. In the context of lean, the configuration that establishes dynamic efficiency, flexibility and learning routines is true continuous flow driven by customer demand and controlled by *kanban*, which is the bufferless, highly interdependent, just-in-time system touted in universalist lean gurus (MacDuffie 1995). Such a system is exceptionally fragile and, as such, is most effectively implemented when managed by a substantively empowered workforce.

But genuinely empowering workers to enthusiastically expend discretionary effort to engage in problem solving and decision making is difficult. It requires extensive workforce training in problem-solving techniques, leadership, and so on. Yet managers face multiple competing demands on their time, including pressures to keep machines running, maximise uptime, and get products out the door. Short-term goals overwhelm long-term goals. Finding time to plan and train is hard to do. The one thing managers must do is ensure physical output to meet customer demands.

Facing such competing demands, managers often emphasize standardization, work simplification, physical labour on the line, and work intensification over training and empowerment. That is the management contradiction. And even if a particular management is able to prioritize training and empowerment, they often face the workforce contradiction: Workers reticent or resistant to increased problem-solving and decision-making responsibility. This experience also encourages managerial satisficing. Why go to all the trouble when selectively adopting lean practices focused on standardization, improved workflow, and smaller batch sizes can yield considerable performance improvements? Or when lean can increase static efficiency by intensifying the labour process rather than empowering workers?

Summing up so far, we have argued that a universal model of lean has emerged and diffused across the globe, which is widely perceived by practitioners as best practice for manufacturing. This has led to a remarkable convergence around lean within manufacturing, but due to the resilience of national institutions and the contradictory nature of the capitalist labor process, the model is implemented in one of a few distinct ways

**Toward an explanation of variation in lean production regimes**

Corporatist and coordinated employment relations institutions at the national level (e.g. Scandinavia) or sectoral level (e.g. Germany) facilitate increased training and worker voice. However, while countries with such institutions will generally have higher levels of skilled labor and worker voice, there remains substantial variation in lean production regimes at the firm/corporate level and even local establishment level. In Germany, for instance, there are variations in union power and worker influence at both the sectoral level and in local works councils – unions and works councils remain stronger in the well-organized core of the economy, but there is an increasingly large periphery that is weakly organized (Doellgast and Greer 2007).

The literature – labor process theory and more broadly – has not provided a good explanation for establishment-level variation in lean production regimes. When implemented as a complementary package including genuine multiskilling and substantive worker empowerment, such a regime enables the highest levels of efficiency and organizational learning. But it is rare. It is important, then, to provide an explanation for why capitalist management tends to adopt inferior lean regimes – as part of a critique of capitalist management and a basis for more forcefully asserting the case for devolving decision-making authority to the workforce.

To facilitate such an explanation, Vidal (2017) developed an inductively derived typology of lean based on two key dimensions along which the implementation of lean may vary. The first dimension concerns authority and worker voice: managers may implement substantive participation (devolving real problem-solving and decision-making authority) or consultative participation (asking workers for input but not giving them real problem-solving or decision-making authority).

The second dimension concerns broader work organization. Managers may adopt lean as a system of complementary practices and or as a toolbox from which practices are selectively drawn. Lean-as-system includes adoption of the most advanced practices regarding continuous improvement in plant layout: frequent and sophisticated use of value stream mapping and true continuous flow driven by customer demand and controlled via *kanban*. Lean-as-toolbox includes adopting a selection of more basic practices – reduced inventory and batch size, quick changeover, 5S, quality at source, visual management, standardized work, product-focused layout and others. Although there may be improved flow and cellular-type structures, these are based on a crude, one-off value stream mapping exercise and there is no true continuous flow controlled via *kanban*.

Combining these two dimensions (each with two main approaches) results in four types of lean: high-involvement lean, autonomous lean, lean standardization and lean enough. We believe this typology is the most general typology of lean production regimes because its two dimensions are basic elements of the labor process: the organization of work (the particular configuration of practices) and relations of authority (over worker participation and decision making).

The literature has highlighted two additional dimensions of fundamental interest to labor process and employment relations scholars: work intensification and informalization (Barnes 2017, Barnes 2018, Jürgens and Krzywdzinski 2016). We consider these dimensions a subtypes within the more general typology of four main approaches, for the following reasons. Intensification results from a specific emphasis of management in the use of particular practices that were developed decades before lean: time/motion study to push standard work times and cycle times down and process mapping to reduce worker downtime. To be sure, these tools have been developed in significant ways within lean, but intensification is an immanent tendency of the capitalist labor process and is an outcome of particular management regimes, which is neither limited to lean nor inherent to lean as a model. Informalization – a high level of casual labor and a lack of institutionalized worker voice – is about employment relations rather than the labor process as such.[[6]](#endnote-6)

For the remainder of the chapter, we first elaborate on the general typology (Figure 1) while taking into account the wider literature. We then discuss the additional two dimensions, which cross-cut the general typology.

[Figure 1 about here]

*High-involvement lean.* This type combines a lean-as-a-system approach substantive worker participation. What distinguishes a lean-as-system approach is the establishment of true continuous flow, in which all operations are linked into a highly interdependent flow via *kanban* and demand is truly customer driven. When workers have wide participation in problem solving with real decision-making authority, this provides the best basis for successfully implementing lean as a system because workers gain critical information from their everyday experience on the shopfloor and because a culture of substantive participation leads to worker-driven continuous improvement. In such a system, value stream mapping exercises and *kaizen* events are run regularly, driven by shopfloor workers, providing the best basis for true continuous improvement.

High-involvement regimes have been documented by a small number of case studies on manufacturing organizations (Adler 1993, Ingvaldsen, Holtskog and Ringen 2013, Vidal 2007a, Vidal 2017). Other evidence suggests something approximating this type has been implemented within organizations across a range of contexts (Benders and Van Bijsterveld 2000, Elger and Smith 2005, Jürgens 2004, Lowe, Delbridge and Oliver 1997, Oliver and Wilkinson 1992, Stanton et al. 2014). However, we believe it is relatively uncommon due to the devolution of authority required and the difficulty of maintaining such a fragile system.

*Lean enough.* This type combines lean-as-toolbox approach with consultative participation. It is the least lean approach, but adopts just enough of the basic lean practices to remain competitive. This regime has been widely observed (Carter et al. 2011, Carter et al. 2013a, Delbridge 2003, Elger and Smith 2005, Procter and Radnor 2014, Rothstein 2016, Schouteten and Benders 2004, Vidal 2007a, Vidal 2017). Because it is the easiest type to implement, based on minimal changes to existing routines, we believe this type is widespread.

*Autonomous lean.* This type combines a lean-as-toolbox approach with substantive empowerment. It is called autonomous lean because substantive empowerment takes the form of a high level of individual worker autonomy. But such autonomy limits the ability to implement high levels of process standardization necessary for lean-as-system. Managers thus selectively adopt basic practices from the broader suite of practices, including reduced inventory and batch sizes, waste elimination disciplines, teamwork, and some degree of flow organization. But it is not a true continuous flow system in which all operations are tightly connected by *kanban* and driven by customer demand. This regime has been observed in manufacturing (Oudhuis and Tengblad 2013, Vidal 2017) and public administration (Holmemo and Ingvaldsen 2018). Applications of lean into healthcare that suggest another source of autonomous lean – the power of professional workers to resist standardization (Stanton et al. 2014, Waring and Bishop 2010).

The autonomy of professional workers may create real constraints and resistance to standardisation pressures. Stanton et al (2014: 2926) argue that “translating lean from a manufacturing context into the politicised and professionalised context of healthcare changes the usual questions about empowerment or work intensification to questions about the influences of powerful stakeholders.” Professional workers expect to be involved in the creation and monitoring of standards, and where lean is perceived as an imposition from above, without the agency of professional workers, it is resisted. If such resistance is successful, the outcome is a form of autonomous lean, where worker autonomy limits the extent of standardization. This type may be relatively common in contexts where workers have institutionalized bases of power – such as under codetermination institutions or where the labor process involves professionals – but otherwise is likely uncommon, due to system-level pressures for standardization.

*Lean standardization.* This type combines a lean-as-system approach with consultative participation. Management focuses on using lean tools to standardize processes throughout the plant, but due to lack of substantive participation, any continuous improvement is entirely management driven (Vidal 2017). We think the Toyota Production System is best characterized as a lean standardization type that achieves the capabilities of a high-involvement regime: Workers are not substantively empowered, but management is sufficiently skilled and determined, and shopfloor workers are sufficiently motivated to regularly contribute ideas and solve problems, that true continuous flow and continuous improvement are achieved. Highly skilled management combined with the Japanese work culture of hierarchy and collectivism, loyalty to the company, and lifetime employment serve as a functional equivalent to a substantively empowered workforce.

*Lean intensification.* This is a subtype – which theoretically may combine with any of the four general types just discussed – that places emphasis on use of lean tools to intensify work. Value stream mapping focuses on systematically cutting non-value added steps out of the production process so that workers have less downtime. This is epitomized by the notorious 57-second minute in automotive assembly, an industry standard that has been pushed up, under lean, from an average productive utility of 40-50 seconds of every minute in traditional North American manufacturing (Adler 1993, Fucini and Fucini 1990). More broadly, lean intensification regimes emphasize driving down standard work times and cycle times.

The lean intensification regime has been widely documented in the auto industry (Danford 1999, Dohse, Jürgens and Malsch 1985, Fucini and Fucini 1990, Graham 1995, Kenney and Florida 1993, Parker and Slaughter 1995, Rinehart, Huxley and Robertson 1997, Rothstein 2016, Stewart et al. 2009). As far as we can tell, the 57-second minute is confined to the auto assembly subsector, which experiences among the most competitive conditions of any industry. It seems the lean intensification approach is the norm within auto assembly and perhaps – as we now turn to discuss – the public sector.

In the public sector in the UK there has been a lot of application of lean practices, especially in health, schools and the civil service, particularly around the idea of teamworking and performance targets. The research team of Carter, Danford, Howcroft, Richardson, Smith, and Taylor, have produced a series of papers documenting how the implementation of lean within UK Revenue and Customs (HMRC) has resulted in widespread deskilling and work intensification (Carter et al. 2011, Carter et al. 2013a). These outcome are associated with increased stress, headaches, fatigue and musculoskeletal disorders (Carter et al. 2013b). They see lean as being applied ideologically as an attack on labor.

In a separate study on lean in the HMRC, Proctor and Radnor (2014: 2987) agreed that “work had become fragmented and degraded.” But they also found that some workers welcomed the increased structure provided and the standardization of processes across sites. Some workers appreciated the opportunity to engage in problem-solving, but they were frustrated that management retained final authority on whether to implement workers’ ideas. And in some sites, where middle managers were able to shape the process, “staff were able to use the diagnostic process to develop and implement their own standards and processes.” They refer to this participation of front-line staff in problem-solving and the development of standards as indirect autonomy, a concept similar to Klein’s (1991) notion of collective autonomy within lean.

This study provoked an intense debate over lean in HMRC (Carter et al. 2017, Procter and Radnor 2017). In our reading, Procter and Radnor did not downplay work intensification or deskilling, and they are attempting to grapple with real variation on how lean is – and could be – implemented. Carter et al. highlight neoliberalism, intensified competition and the rise of new public management as key contextual factors facilitating the spread of lean into the public sector (Carter et al. 2011), and criticize Procter and Radnor for failing to appreciate this context (Carter et al. 2017). In our view, these contextual factors are important less for explaining the diffusion of lean as such, and more for explaining why the lean intensification form has been adopted in this context. In a public-sector context where cost cutting is the main priority and the “customer” has no alternative choice, then a lean intensification (and deskilling) approach should be expected (Esbenshade et al. 2015).

We think the most common type of lean is likely to be *lean enough* with work intensification. Lean enough is the least difficult form to implement, requiring the fewest changes to existing authority structures and routines. At the same time, the lean emphasis on waste reduction and the elimination of non-value added processes lends itself to the intensification of work. Intensification may also be common on lean standardization regimes. It is not likely to occur in autonomous lean regimes, with their lack of systematic standardization and is perhaps less likely in high-involvement regimes. Which types of lean are most common, and whether lean intensification is widespread outside of auto assembly, are key questions for future research.

*Informalized lean.* This is a subtype in which there is high level of casual labor and a lack of institutionalized worker voice. It has recently been documented in more authoritarian societies, such as China and Russia, and as such, lean practices exist in a context where labour markets are more informal, where workers have more limited or no formal institutional voice (especially in China) and where workers’ consent, participation and engagement within the workplace are constrained. In line with our emphasis on the management contradiction, researchers looking at auto industry in emerging economies note “…there is a particular tension at the BRIC locations between efforts to implement modern lean production systems yet at the same time secure ‘low cost’ solutions” (Jürgens and Krzywdzinski 2016: 71-2). Yet, writers are divided about the role of lean production in these settings.

For some (Jürgens and Krzywdzinski 2016, Krzywdzinski, Lechowski and Jürgens 2018) while low cost producers exist in countries like India and China, nevertheless, in the auto sector there is also an upgrading process that fits within what they see as the functional requirements of lean, which demands greater worker engagement and an strong movement towards upskilling, teamworking and more commitment and engagement from the local workforce. These writers acknowledge that there may be some initial dualism, between regular and more precarious employees, and low-cost and high cost systems coexisting. As such they “…expect that the domestic companies from emerging economies, while upgrading, will attempt to retain their cost advantages over the multinationals, for instance by preserving their labor regimes or cheap local supply chains. This can, however, easily result in a deadlock, especially if investments in new knowledge and skills are neglected” (Krzywdzinski, Lechowski and Jürgens 2018: 12). Hence Krzywdzinski et al foresee an inconclusive or polarised future in BRIC economies that embrace lean in sectors like autos but in a context where the abundance of cheap labour applies a brake on any management intentions to upgrade labour and labour processes.

Others suggest that lean is not a motor for upgrading or development. Zhang (2015) argues that in China there is greater informality in the labour market and tendency to have higher numbers of workers on flexible contracts, and an overall dualism between more casual and more regular workers. In this scenario, there is limited or no upgrading without the two groups of workers working more cooperatively to resist labour market and labour process segmentation. Chen and Chan (2018) question this interpretation and did not find a divide between agency and more secure workers to be crucial, as suggested by Zhang – certainly agency workers were not more likely to resist and struggle. We would suggest that there is a Chinese element to this argument – the rural-urban divide being reinforced through the household registration system, adding a political layer to the dualism identified by Zhang (Smith and Pun 2018). However, workplace-based dualism is only partially ‘Chinese’ – the auto industry globally is structured between workers on core/regular and peripheral/temporary employment contracts. In other words there is systemic practice – and a general capitalist or systematic use of this form of contractual divide.

Researching Indian autos, Barnes (2017, 2018) considers that the industry remains tied to underdevelopment and suggests that more globally, the spread of ‘informalised lean’, which is pioneered in emerging economies, is now leaking into developed economies as the growth of agency working and dual labour contracting becomes more broadly embedded (Moody 2017: 14-19). But the work of Jürgens and Krzywdzinski (2016) and Krzywdzinski (2018) suggest more dynamism in the BRICs. Overall their work, covering car plants in Brazil, India, China and Russia, indicates a direction of upgrading of employment contracts and investment in training, because the technical and production demands of lean require a trained and more stable workforce. Barnes (2017) notes that local norms, which are regionally diverse within India, inhibit any production-driven standardisation from global carmakers’ governance practices. Rather than expected upgrading of employment, driven by the need for stable and trained workers, his evidence suggests continued bi-furcation of the workforce and continued conflict based on status or employment inequalities between workers.

The differences between these authors may be due to different empirical research cases. Barnes acknowledges that the Jürgens and Krzywdzinski research evidence is from VW (although in fact they look at Toyota and local producers as well) which has different employment relations, while Barnes’ main evidence is from suppliers (he has very few interviews with OEMs) and the OEMs he investigates are mainly Maruti-Suzuki and Honda - both of which are rather anti-union companies with strongly embedded conflicts between organised labour and management (typically around the different treatment of directly and indirectly hired workers) – including the killing of a human resource manager in July 2012 (Barnes 2018: 2). Hence, divergence in their argument could also be based in whom they talked to, rather theoretical differences. Barnes has fewer management interviews; his empirical evidence comingfrom interviews with workers. While in this way he undoubtedly captures more of the workers' perceptions, he may have limited engagement of the companies' aims and practices.

Informalized lean may be combined with the more general types, although it is most likely to occur within a context of consultative participation: that is, in a lean standardization regime or lean enough regime. Most likely is some combination of lean enough that is both informalized and intensified.

CONCLUSION

Lean has spread across the globe and across sectors from its origins at Toyota. Its diffusion, however, has been uneven, contested and contradictory. Because the critique of lean as a system of deskilling and work intensification is widely associated with labor process theory, we focus our concluding thoughts on these issues.

Deskilling and work intensification under lean is widespread, resulting in work that is not only monotonous and exhausting, but physically deleterious to the health of workers (Bouville and Alis 2014, Carter et al. 2013b). It is important for researchers to continue to document this. But the literature also shows that lean can be implemented with genuine multiskilling and substantive worker participation, and without intensifying work. In our analysis, the sources of work intensification are not particular management models, Taylorism, lean or otherwise. Rather, we see work intensification as an immanent tendency inherent to the capitalist labour process (Marx [1867] 1990), a tendency which is moderated or magnified by broad institutional forces, power relations between capital and labor, and the orientations of local managers.

At the broadest level, the Fordist accumulation regime that persisted in North America and Western Europe from the Second World War through the early 1970s (Aglietta [1976] 2000, Jessop 1989, Vidal 2015) institutionalized a form of oligopolistic competition in the private sector and traditional public administration in the public sector, which combined with high profits, powerful unions and Fordist just-in-case production to greatly diminish intensification pressures in major sectors. In the post-Fordist period, globalization and intensified competition, financialization and neoliberalism, and union decline have all combined to unleash pressures for work intensification (Thompson 2003, Vidal 2013). In the 1990s, work intensification rose in all of the EU countries except Austria, Denmark and Finland – countries with high union density and strong institutional forms of codetermination (Green 2006). In the US, intensification has occurred across all occupations (Crowley et al. 2010, Smith 1997).

If there has been a general rise in work intensification in the era of postfordism and neoliberalism, there are other factors that shape the extent of intensification along with the skill profile and nature of worker participation within the lean labor process. As we have seen, national employment relations institutions and power balances between capital and labor matter. Thus, the powerful labor movements and institutions of codetermination in Germany and Norway are facilitating the adoption of lean with multiskilled labor and substantive forms of participation. However, certain sectors seem prone to work intensification. In particular, the auto industry is under extreme competitive pressure and has developed a normative goal of having workers work 57 seconds of every minute, while lean in the public sector has generally been adopted to cut costs with limited concern for service quality.

Finally, managers are not personifications of capital or passive conduits of a universal imperative to deskill labor. Rather, managers vary in their orientations and aspiration levels. While some managers satisfice with a lean-enough approach – a “limited, low-level application of lean” (Procter and Radnor 2014: 2981) that may prioritize deskilling and work intensification – other managers seek to implement a high-involvement, lean-as-system approach. Because such an approach is difficult to implement and maintain, and managers face contradictory pressures, it is likely to remain uncommon, particularly in places with weak unions and no institutions for codetermination.

In our view, criticisms of lean should not focus on labelling it as a system that inherently produces deskilling and work intensification, but rather should emphasize that these outcomes are – in addition to being degrading and damaging to workers – inefficient applications of lean. Implementing lean as a system including substantive worker participation and true multiskilling results in more efficient and flexible organizations that are better able to engage in continuous improvement.

If capitalist management is systematically satisficing in response to the contradictions of the postfordist labor process and the difficulties of implementing high-involvement lean, this provides a basis for a critique of capitalism that goes beyond its impact on the degradation of labor. Efficiency is a language that capitalists understand. At a policy level, unions, works councils, labor-management partnerships and other forms of institutionalized worker power could help increase efficiency by ensuring multiskilling and substantive participation. At the local establishment level, workers and their unions should use the rhetoric of efficiency, service quality, and empowerment against managers who fail to adopt multiskilling and substantive employee involvement.

**Figure 5.1.** A Typology of Lean Production Regimes

|  |  |  |
| --- | --- | --- |
|  | Lean-as-system | Lean-as-toolbox |
| Substantive participation | High-involvement lean | Autonomous lean |
| Nominal participation | Lean standardization | Lean enough |

REFERENCES

Adler, Paul. 1993. "The Learning Bureaucracy: New United Motor Manufacturing Inc.". *Research in Organizational Behavior* (15):111-94.

Adler, Paul S. 1990. "Marx, Machines, and Skill." *Technology and Culture* 31(4):780-812. doi: 10.2307/3105907.

Adler, Paul S. 2007. "The Future of Critical Management Studies: A Paleo-Marxist Critique of Labour Process Theory." *Organization Studies* 28(9):1313-45. doi: 10.1177/0170840607080743.

Aglietta, Michel. [1976] 2000. *A Theory of Capitalist Regulation: The U.S. Experience*. London: Verso.

Alsyouf, Imad, Uday Kumar, Lubna Al-Ashi and Muna Al-Hammadi. 2018. "Improving Baggage Flow in the Baggage Handling System at a Uae-Based Airline Using Lean Six Sigma Tools." *Quality Engineering*:1-21. doi: 10.1080/08982112.2018.1437180.

Appelbaum, Eileen and Rosemary Batt. 1994. *The New American Workplace: Transforming Work Systems in the United States*. Ithaca, NY: ILR Press.

Barnes, Tom. 2017. "Why Has the Indian Automotive Industry Reproduced “Low Road” Labour Relations?" Pp. 37-56 in *Critical Perspectives on Work and Employment in Globalizing India*, edited by E. Noronha and P. D'Cruz. Singapore: Springer Singapore.

Barnes, Tom. 2018. *Making Cars in the New India: Industry, Precarity and Informality*. Cambridge: Cambridge University Press.

Bélanger, Jacques and Paul Edwards. 2007. "The Conditions Promoting Compromise in the Workplace." *British Journal of Industrial Relations* 45(4):713-34.

Bell, Steven. C. and Michael A. Orzen. 2016. *Lean It: Enabling and Sustaining Your Lean Transformation*. Boca Raton: CRC Press.

Benders, Jos and Mark Van Bijsterveld. 2000. "Leaning on Lean: The Reception of a Management Fashion in Germany." *New Technology, Work and Employment* 15(1):50-64. doi: doi:10.1111/1468-005X.00064.

Benders, Jos, Marlieke van Grinsven and Jonas A. Ingvaldsen. 2018. "The Persistence of Management Ideas: How Framing Keeps ‘Lean’ Moving." in *The Oxford Handbook of Management Ideas*, edited by A. Sturdy, S. Heusinkveld, T. Reay and D. Strang. Oxford: Oxford University Press.

Bouville, Gregor and David Alis. 2014. "The Effects of Lean Organizational Practices on Employees' Attitudes and Workers' Health: Evidence from France." *The International Journal of Human Resource Management* 25(21):3016-37. doi: 10.1080/09585192.2014.951950.

Boyer, Robert. 1998. "Hybridization and Models of Production: Geography, History, and Theory." Pp. 23-56 in *Between Imitation and Innovation: The Transfer and Hybridization of Productive Models in the International Automobile Industry*, edited by R. Boyer, E. Charron, U. Jürgens and S. Tolliday. Oxford: Oxford University Press.

Butollo, Florian, Ulrich Jürgens and Martin Krzywdzinski. 2018. "From Lean Production to Industrie 4.0. More Autonomy for Employees?". Discussion Paper SP III 2018–303, WZB Berlin Social Science Center.

Carter, Bob, Andy Danford, Debra Howcroft, Helen Richardson, Andrew Smith and Phil Taylor. 2011. "‘All They Lack Is a Chain’: Lean and the New Performance Management in the British Civil Service." *New Technology, Work and Employment* 26(2):83-97. doi: 10.1111/j.1468-005X.2011.00261.x.

Carter, Bob, Andrew Danford, Debra Howcroft, Helen Richardson, Andrew Smith and Philip Taylor. 2013a. "Taxing Times: Lean Working and the Creation of (in)Efficiencies in Hmrc." *Public Administration* 91(1):83-97.

Carter, Bob, Andy Danford, Debra Howcroft, Helen Richardson, Andrew Smith and Phil Taylor. 2013b. "‘Stressed out of My Box’: Employee Experience of Lean Working and Occupational Ill-Health in Clerical Work in the Uk Public Sector." *Work, Employment & Society*. doi: 10.1177/0950017012469064.

Carter, Bob, Andrew Danford, Debra Howcroft, Helen Richardson, Andrew Smith and Phil Taylor. 2017. "Uncomfortable Truths – Teamworking under Lean in the Uk." *The International Journal of Human Resource Management* 28(3):449-67. doi: 10.1080/09585192.2015.1111251.

Chen, Yiu Por (Vincent) and Anita Chan. 2018. "Regular and Agency Workers: Attitudes and Resistance in Chinese Auto Joint Ventures." *The China Quarterly* 233:85-110.

Cole, Robert E. 1989. *Strategies for Learning: Small-Group Activities in American, Japanese and Swedish Industry*. Berkeley: University of California Press.

Cressey, Peter and John MacInnes. 1980. "Voting for Ford: Industrial Democracy and the Control of Labour." *Capital & Class* 4(2):5-33. doi: 10.1177/030981688001100101.

Crowley, Martha, Daniel Tope, Lindsey Joyce Chamberlain and Randy Hodson. 2010. "Neo-Taylorism at Work: Occupational Change in the Post-Fordist Era." *Social Problems* 57(3):421-47.

Cusumano, Michael A. 1985. *The Japanese Automobile Industry: Technology and Management at Nissan and Toyota*. Cambridge: Harvard University Press.

Danford, Andy. 1999. *Japanese Management Techniques and British Workers*. London: Mansell.

Dedoussis, Vagelis and Craig R. Littler. 1994. "Understanding the Transfer of Japanese Management Practices: The Australian Case." Pp. 175-95 in *Global Japanization? The Transnational Transformation of the Labour Process*, edited by T. Elger and C. Smith. London: Routledge.

Delbridge, Rick. 2003. *Life on the Line in Contemporary Manufacturing: The Workplace Experience of Lean Production and the 'Japanese' Model*. Oxford: Oxford University Press.

Doellgast, Virginia and Ian Greer. 2007. "Vertical Disintegration and the Disorganisation of German Industrial Relations." *British Journal of Industrial Relations* 45(1):55-76.

Doellgast, Virginia. 2012. *Disintegrating Democracy at Work: Labor Unions and the Future of Good Jobs in the Service Economy*. Ithaca, NY: ILR Press.

Dohse, Knuth, Ulrich Jürgens and Thomas Malsch. 1985. "From 'Fordism' to 'Toyotism'? The Social Organization of the Labor Process in the Japanese Automobile Industry." *Politics and Society* 14(2):115-45.

Edwards, R. 1979. *Contested Terrain: The Transformation of the Workplace in the Twentieth Century*. London: Heinemann.

Elger, Tony. 1979. "Valorisation and ‘Deskilling’: A Critique of Braverman." *Capital & Class* 3(1):58-99. doi: 10.1177/030981687900700104.

Elger, Tony and Chris Smith. 1994a. "Introduction." Pp. 1-24 in *Global Japanization: The Transnational Transformation of the Labour Process*, edited by T. Elger and C. Smith. London: Routledge.

Elger, Tony and Chris Smith. 1994b. "Global Japanization? Convergence and Competition in the Organization of the Labor Process." Pp. 27-59 in *Global Japanization: The Transnational Transformation of the Labour Process*, edited by T. Elger and C. Smith. London: Routledge.

Elger, Tony and Chris Smith, eds. 1994c. *Global Japanization: The Transnational Transformation of the Labour Process*. London: Routledge.

Elger, Tony and Chris Smith. 2005. *Assembling Work: Remaking Factory Regimes in Japanese Multinationals in Britain*. Oxford: Oxford University Press.

Esbenshade, Jill, Matt Vidal, Gina Fascilla and Mariko Ono. 2015. "Customer-Driven Management Models for Choiceless Clientele? Business Process Reengineering in a California Welfare Agency." *Work, Employment & Society*. doi: 10.1177/0950017015604109.

Fantasia, Rick, Dan Clawson and Gregory Graham. 1988. "A Critical View of Worker Participation in American Industry." *Work and Occupations* 15(4):468-88. doi: 10.1177/0730888488015004006.

Freyssenet, Michel, Andrew Mair, Koichi Shimizu and Giuseppe Volpato, eds. 1998. *One Best Way? Trajectories and Industrial Models of the World's Automobile Producers*. Oxford: Oxford University Press.

Friedman, Andrew L. 1977. *Industry and Labour: Class Struggle at Work and Monopoly Capitalism*. London: The Macmillan Press Ltd.

Fucini, Joseph J and Suzy Fucini. 1990. *Working for the Japanese: Inside Mazda's American Auto Plant*. New York: The Free Press.

Garza-Reyes, Jose Arturo, Ioannis E. Betsis, Vikas Kumar and Moh’d Anwer Radwan Al-Shboul. 2018. "Lean Readiness – the Case of the European Pharmaceutical Manufacturing Industry." *International Journal of Productivity and Performance Management* 67(1):20-44. doi: doi:10.1108/IJPPM-04-2016-0083.

Graham, Laurie. 1995. *On the Line at Subaru-Isuzu: The Japanese Model and the American Worker*. Ithaca, NY: Cornell University Press.

Green, Francis. 2006. *Demanding Work: The Paradox of Job Quality in the Affluent Economy*. Princeton: Princeton University Press.

Gronning, Terje. 1997. "The Emergence and Institutionalization of Toyotism: Subdivision and Integration of the Labour Force at the Toyota Motor Corporation from the 1950s to the 1 970s." *Economic and Industrial Democracy* 18(3):423-55.

Gustavsen, Bjørn. 2007. "Work Organization and `the Scandinavian Model'." *Economic and Industrial Democracy* 28(4):650-71. doi: 10.1177/0143831x07082218.

Herscovici, Arie. 2018. "New Development: Lean Thinking in Smart Cities." *Public Money & Management* 38(4):320-24. doi: 10.1080/09540962.2018.1450924.

Holmemo, Marte D. Q. and Jonas A. Ingvaldsen. 2018. "Local Adaption and Central Confusion: Decentralized Strategies for Public Service Lean Implementation." *Public Money & Management* 38(1):13-20. doi: 10.1080/09540962.2018.1389493.

Ingvaldsen, Jonas A., Halvor Holtskog and Geir Ringen. 2013. "Unlocking Work Standards through Systematic Work Observation: Implications for Team Supervision." *Team Performance Management: An International Journal* 19(5/6):279-91. doi: doi:10.1108/TPM-11-2012-0039.

Ishida, Hideo. 1986. "Transferability of Japanese Human Resource Management Abroad." *Human Resource Management* 25(1):103-20. doi: doi:10.1002/hrm.3930250108.

Jacoby, Sanford M. 1983. "Union-Management Cooperation in the United States: Lessons from the 1920s." *Industrial and Labor Relations Review* 37(1):18-33. doi: 10.2307/2522721.

Jessop, Bob. 1989. "Conservative Regimes and the Transition to Post-Fordism: The Cases of Great Britain and West Germany." Pp. 261-99 in *Capitalist Development and Crisis Theory: Accumulation, Regulation and Spatial Restructuring*, edited by M. Gottdiener and N. Komninos. New York: St Martin’s Press.

Johansson, Jan, Lena Abrahamsson and Stina Johansson. 2013. "If You Can’t Beat Them, Join Them? The Swedish Trade Union Movement and Lean Production." *Journal of Industrial Relations* 55(3):445-60. doi: 10.1177/0022185613483999.

Jürgens, Ulrich. 2004. "An Elusive Model – Diversified Quality Production and the Transformation of the German Automobile Industry." *Competition & Change* 8(4):411-23.

Jürgens, Ulrich and Martin Krzywdzinski. 2016. *New Worlds of Work: Varieties of Work in Car Factories in the Bric Countries*. Oxford: Oxford University Press.

Kenney, Martin and Richard Florida. 1993. *Beyond Mass Production: The Japanese System and Its Transfer to the U.S.* Oxford: Oxford University Press.

Klein, Janice A. 1991. "A Reexamination of Autonomy in Light of New Manufacturing Practices." *Human Relations* 44(1):21-38.

Klug, Florian. 2018. "Lean Logistics." Pp. 287-326 in *Logistikmanagement in Der Automobilindustrie: Grundlagen Der Logistik Im Automobilbau*, edited by F. Klug. Berlin: Springer.

Kochan, Thomas A., Russell D. Lansbury and John Paul MacDuffie, eds. 1997. *After Lean Production: Evolving Employment Practices in the World Auto Industry*. Ithaca, NY: ILR Press.

Krafcik, John F. 1988. "Triumph of the Lean Production System." *Sloan Management Review* 30(1):41-52.

Kroes, James R., Andrew S. Manikas and Thomas F. Gattiker. 2018. "Operational Leanness and Retail Firm Performance since 1980." *International Journal of Production Economics* 197:262-74. doi: <https://doi.org/10.1016/j.ijpe.2018.01.006>.

Krzywdzinski, Martin. 2017. "Accounting for Cross-Country Differences in Employee Involvement Practices: Comparative Case Studies in Germany, Brazil and China." *British Journal of Industrial Relations* 55(2):321-46. doi: 10.1111/bjir.12230.

Krzywdzinski, Martin, Grzegorz Lechowski and Ulrich Jürgens. 2018. "The Inevitability of Change in Chinese and Indian Automakers’ Low Cost Productive Models." *La Nouvelle Revue du Travail* 12.

Liker, Jeffrey K., W. Mark Fruin and Paul S. Adler. 1999. *Remade in America: Transplanting and Transforming Japanese Management Systems* Oxford: Oxford University Press.

Liker, Jeffrey K. 2004. *The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer*. New York: McGraw-Hill.

Liker, Jennifer K. and Jeffrey N. Karlin. 2018. "Just-in-Time and Trucking Logistics: The Lean Learning Enterprise." Pp. 229-62 in *Trucking in the Age of Information* edited by D. Belman and C. W. III. London: Routledge.

Littler, Craig R. 1982. *The Development of the Labour Process in Capitalist Societies*. London: Heinemann.

Lowe, James, Rick Delbridge and Nick Oliver. 1997. "High-Performance Manufacturing: Evidence from the Automotive Components Industry." *Organization Studies* 18(5):783-98.

MacDuffie, John Paul. 1995. "Human Resource Bundles and Manufacturing Performance: Organizational Logic and Flexible Production Systems in the World Auto Industry." *Industrial and Labor Relations Review* 48(2):197-221.

MacDuffie, John Paul and Frits K. Pil. 1997. "Changes in Auto Industry Employment Practices: An International Overview." in *After Lean Production: Evolving Employment Practices in the World Auto Industry*, edited by T. A. Kochan, R. D. Lansbury and J. P. MacDuffie. Ithaca, NY: ILR Press.

Marx, Karl. [1867] 1990. *Capital, Vol. 1*. Translated by B. Fowkes. London: Penguin.

Merkle, Judith A. 1980. *Management and Ideology: The Legacy of the International Scientific Management Movement*. Berkeley: University of California Press.

Mishina, Kazuhiro. 1998. "Making Toyota in America: Evidence from the Kentucky Transplant, 1986-1994." Pp. 99-127 in *Between Imitation and Innovation: The Transfer and Hybridization of Productive Models in the International Automobile Industry*, edited by R. Boyer, E. Charron, U. Jürgens and S. Tollidary. Oxford: Oxford University Press.

Moody, Kim. 2017. *On New Terrain*. Chicago: Haymarket Books.

Ohno, Taiichi. 1988. *Toyota Production System: Beyond Large-Scale Production*. New York: Productivity Press.

Okayama, Reiko. 1986. "Industrial Relations in the Japanese Automobile Industry, 1945- 79: The Case of Toyota." Pp. 168-89 in *Between Fordism and Flexibility: The Automobile Industry and Its Workers*, edited by S. Tollidary and J. Zeitlin. Oxford: Polity.

Oliver, Nick and Barry Wilkinson. 1992. *The Japanization of British Industry: New Developments in the 1990s*. Oxford: Blackwell.

Osono, Emi, Norihiko Shimizu, Hirotaka Takeuchi and John Kyle Dorton. 2008. *Extreme Toyota: Radical Contradictions That Drive Success at the World's Best Manufacturer*. Hoboken, New Jersey: John Wiley & Sons, Inc.

Oudhuis, Margareta and Stefan Tengblad. 2013. "Experiences from Implementation of Lean Production: Standardization Versus Self-Management: A Swedish Case Study." *Nordic journal of working life studies* 3(1):31-48.

Parker, Mike and Jane Slaughter. 1995. "Unions and Management by Stress." in *Lean Work: Empowerment and Exploitation in the Global Auto Industry*, edited by S. Babson. Detroit: Wayne State University Press.

Procter, Stephen and Zoe Radnor. 2014. "Teamworking under Lean in Uk Public Services: Lean Teams and Team Targets in Her Majesty's Revenue & Customs (Hmrc)." *The International Journal of Human Resource Management* 25(21):2978-95. doi: 10.1080/09585192.2014.953976.

Procter, Stephen and Zoe Radnor. 2017. "Teamworking and Lean Revisited: A Reply to Carter Et Al." *The International Journal of Human Resource Management* 28(3):468-80. doi: 10.1080/09585192.2015.1111252.

Rinehart, James, Christopher Huxley and David Robertson. 1997. *Just Another Car Factory? Lean Production and Its Discontents*. Ithaca, NY: Cornell University Press.

Rothstein, Jeffrey S. 2016. *When Good Jobs Go Bad: Globalization, De-Unionization, and Declining Job Quality in the North American Auto Industry*. New Brunswick: Rutgers University Press.

Schouteten, Roel and Jos Benders. 2004. "Lean Production Assessed by Karasek’s Job Demand–Job Control Model." *Economic and Industrial Democracy* 25(3):347-73. doi: 10.1177/0143831x04044831.

Shimizu, Koichi. 1998. "A New Toyotaism?" Pp. 63-90 in *One Best Way? Trajectories and Industrial Models of the World's Automobile Producers*, edited by M. Freyssenet, A. Mair, K. Shimizu and G. Volpato. Oxford: Oxford University Press.

Smith, Chris and Paul Thompson, eds. 1992. *Labour in Transition: The Labour Process in Eastern Europe and China*. London: Routledge.

Smith, Chris and Peter Meiksins. 1995. "System, Society and Dominance Effects in Cross-National Organisational Analysis." *Work, Employment & Society* 9(2):241-67. doi: 10.1177/095001709592002.

Smith, Chris. 2015. "Continuity and Change in Labor Process Analysis Forty Years after Labor and Monopoly Capital." *Labor Studies Journal* 40(3):222-42. doi: 10.1177/0160449x15607154.

Smith, Chris and Ngai Pun. 2018. "Class and Precarity: An Unhappy Coupling in China’s Working Class Formation." *Work, employment and society* 32(3):599-615. doi: 10.1177/0950017018762276.

Smith, Vicki. 1997. "New Forms of Work Organization." *Annual Review of Sociology* 23:315-39.

Stanton, Pauline, Richard Gough, Ruth Ballardie, Timothy Bartram, Greg J. Bamber and Amrik Sohal. 2014. "Implementing Lean Management/Six Sigma in Hospitals: Beyond Empowerment or Work Intensification?". *The International Journal of Human Resource Management* 25(21):2926-40. doi: 10.1080/09585192.2014.963138.

Stewart, Paul, Mike Richardson, Andy Danford, Ken Murphy, Tony Richardson and Vicki Wass. 2009. *We Sell Our Time No More: Workers' Struggles against Lean Production in the British Car Industry*. London: Pluto.

Sunder M., Vijaya and Jiju Antony. 2018. "A Conceptual Lean Six Sigma Framework for Quality Excellence in Higher Education Institutions." *International Journal of Quality & Reliability Management* 35(4):857-74.

Tezel, Algan, Lauri Koskela and Zeeshan Aziz. 2018. "Lean Thinking in the Highways Construction Sector: Motivation, Implementation and Barriers." *Production Planning & Control* 29(3):247-69. doi: 10.1080/09537287.2017.1412522.

Thirkell, Emma and Ian Ashman. 2014. "Lean Towards Learning: Connecting Lean Thinking and Human Resource Management in Uk Higher Education." *The International Journal of Human Resource Management* 25(21):2957-77. doi: 10.1080/09585192.2014.948901.

Thompson, Paul. 1983. *The Nature of Work: An Introduction to Debates on the Labour Process*. London: The Macmillan Press.

Thompson, Paul. 2003. "Disconnected Capitalism: Or Why Employers Can't Keep Their Side of the Bargain." *Work, Employment & Society* 17(2):359-78. doi: 10.1177/0950017003017002007.

Thompson, Paul and Chris Smith. 2009. "Labour Power and Labour Process: Contesting the Marginality of the Sociology of Work." *Sociology* 43(5):913-30.

Thompson, Paul and Diane van den Broek. 2010. "Managerial Control and Workplace Regimes: An Introduction." *Work, Employment & Society* 24(3):1-12. doi: 10.1177/0950017010384546.

Tolliday, Steven. 1998. "The Diffusion and Transformation of Fordism: Britain and Japan Compared." Pp. 57-95 in *Between Imitation and Innovation: The Transfer and Hybridization of Productive Models in the International Automobile Industry*, edited by R. Boyer, E. Charron, U. Jürgens and S. Tolliday. Oxford: Oxford University Press.

Tolliday, Steven, Robert Boyer, Elsie Charron and Ulrich Jürgens. 1998. "Introduction: Between Imitation and Innovation: The Transfer and Hybridization of Productive Models in the International Automobile Industry." Pp. 1-19 in *Between Imitation and Innovation: The Transfer and Hybridization of Productive Models in the International Automobile Industry*, edited by R. Boyer, E. Charron, U. Jürgens and S. Tollidary. Oxford: Oxford University Press.

Tsutsui, William. 1998. *Manufacturing Ideology: Scientific Management in Twentieth-Century Japan*. Princeton: Princeton University Press.

Turner, Lowell. 1991. *Democracy at Work: Changing World Markets and the Future of Labor Unions*. Ithaca, NY: Cornell University Press.

Udagawa, Masaru. 1995. "The Development of Production Management at the Toyota Motor Corporation." *Business History* 37(2):107-20.

Vidal, Matt. 2007a. "Manufacturing Empowerment? 'Employee Involvement' in the Labour Process after Fordism." *Socio-Economic Review* 5(2):197-232.

Vidal, Matt. 2007b. "Lean Production, Worker Empowerment, and Job Satisfaction: A Qualitative Analysis and Critique." *Critical Sociology* 33(1-2):247-78.

Vidal, Matt. 2011. "Reworking Postfordism: Labor Process Versus Employment Relations." *Sociology Compass* 5(4):273-86.

Vidal, Matt. 2013. "Postfordism as a Dysfunctional Accumulation Regime: A Comparative Analysis of the USA, the Uk and Germany." *Work, Employment & Society* 27(3):451-71. doi: 10.1177/0950017013481876.

Vidal, Matt and Marco Hauptmeier. 2014. "Comparative Political Economy and Labour Process Theory: Toward a Synthesis." Pp. 1-32 in *Comparative Political Economy of Work*, edited by M. Hauptmeier and M. Vidal. Basingstoke: Palgrave Macmillan.

Vidal, Matt. 2015. "Fordism and the Golden Age of Atlantic Capitalism " Pp. 283-305 in *Sage Handbook of the Sociology of Work and Employment*, edited by S. Edgell, H. Gottfried and E. Granter. London: Sage.

Vidal, Matt. 2017. "Lean Enough: Institutional Logics of Best Practice and Managerial Satisficing in American Manufacturing." *Socius* 3:1-17.

Vidal, Matt. 2019. "Contradictions of the Labour Process, Worker Empowerment and Capitalist Inefficiency." *Historical Materialism* forthcoming.

Waring, Justin, J. and Simon Bishop. 2010. "Lean Healthcare: Rhetoric, Ritual, Resistance." *Social Science and Medicine* 71(7):1332-40.

Willmott, Hugh. 1990. "Subjectivity and the Dialectics of Praxis: Opening up the Core of Labour Process Analysis." Pp. 336-78 in *Labour Process Theory*, edited by D. Knights and H. Willmott. Basingstoke, UK: Macmillan.

Womack, James, Daniel Jones and Daniel Roos. 1990. *The Machine That Changed the World*. New York: Rawson Associates.

Zhang, Lu. 2015. *Inside China's Automobile Factories*. Cambridge: Cambridge University Press.

1. We would like to thank the following colleagues for written comments on this chapter, all of which helped sharpen the argument: Jonas Ingvaldsen, Martin Krzywdzinski, Tom Janoski and two anonymous reviewers. [↑](#endnote-ref-1)
2. Several lean practices focus directly on reducing waste, including value stream mapping, setup reduction, quality at the source and 5S (a standardisation procedure that roughly translates as sort, set in order, shine, standardise and sustain). Value stream mapping and other practices focus on improving workflow. When not using an assembly line, workflow takes the form of product-focused layouts which contain all the operations needed to finish a product in the same location, to achieve continuous flow. These layouts are variously called cells (US and UK), U-shaped lines (Japan), flow groups (Scandinavia) or production islands (Germany). *Kanban* is a form of production control linking upstream operations to downstream ones via a card or container. Takt time is the rate at which products need to be produced to fulfil customer demand, and is defined as total demand divided by available production time. *Kaizen* means continuous incremental innovation, and often takes place in offline problem-solving groups or quality circles. [↑](#endnote-ref-2)
3. For an extended elaboration of this reading of Marx, see Vidal (2019). [↑](#endnote-ref-3)
4. On the institutionalization of a single, detailed model of lean production as widely agreed best practice in the US, see Vidal (2017). [↑](#endnote-ref-4)
5. Osono et al. (2008: xii, 20, 26) argue that the source of Toyota’s success is that it “actively embraces and cultivates contradictions instead of passively coping with them. Toyota actually thrives on paradoxes; it harnesses opposing propositions to energize itself … relentlessly [pitting] these forces against each other to realize continuous innovation and constant renewal.” For them, contradictions refer to any conflicting idea or proposal inside an organization, which can be actively cultivated so that problems can be seen from multiple perspectives in search of a “solution … that is not a compromise or an easy way out of conflicting demands but is optimal” resulting in the “transcendence” of the contradiction. By contrast, we use the term in Marx’s sense of material contradictions, that is, where two social processes are constituted as part of a mutually interdependent social relation, and these two processes are potentially in conflict. In our use, the management and workforce contradictions stem from the fundamental contradiction between the forces and relations of production; they cannot be reconciled within capitalism, only managed more or less effectively. [↑](#endnote-ref-5)
6. Following Littler (1982), labor process theory has long distinguished the labor process as such (the organization of work and relations of authority) from the wider employment relation (wage and incentive systems, length of the employment contract, grievance procedures, collective bargaining) (Thompson 2003, Vidal 2011). [↑](#endnote-ref-6)