

# The Global Social Factory & Supply Chains

Neoliberalism and the Rise of Containerization

## **MODULE TWO READER**



The Bay Area Public School  
2012

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Labor and materials stolen from bosses and capitalists as much as we could get away with

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# The Global Social Factory & Supply Chains

## READING LIST

### MODULE ONE

#### *Challenges to Capital and Changing Class Composition*

- Read chapter “California Labor: Total Engagement,” in *California: The Great Exception* (1949) by Carey McWilliams about near-general strikes on the San Francisco waterfront in 1886, 1893, 1901, and 1916 (setting the stage for the waterfront general strike in 1934), pp. 127 – 149
- Read excerpts from *Men and Machines: A Story about Longshoring on the West Coast Waterfront* (1963) jointly produced by ILWU and PMA to announce the Mechanization and Modernization Agreement of 1960.
- Read “Effects of Automation in the Lives of Longshoremen,” in *Singlejack Solidarity* (1983) by Stan Weir, pp. 91 – 106

### MODULE TWO

#### *Neoliberalism and the Rise of Cargo Containers*

- Read chapter titled "The Rise and Limits of Lean Production," in *Workers in a Lean World* (1997) by Kim Moody for background on Toyota-ism and the use of networks of subcontractors in manufacturing, pp. 85-113
- Read “Introduction” and chapter 1, titled “Freedom’s Just Another Word . . .,” from *A Brief History of Neoliberalism* (2005) by David Harvey for political, economic and ideological changes that wrought neoliberal globalization, pp. 1-38
- Read chapters 1, 4 & 14 from *The Box: How the Shipping Container Made the World Smaller and the World Economy Bigger* (2006) by Marc Levinson, pp. 1-15, 54-75, 264-278
- Watch *The Box that Changed Britain* (2010), 58-minute documentary history of intermodal cargo containers and changes in transport industry

### MODULE THREE

#### *Global Supply Chains the Logistics Revolution*

- Read “Logistics – The Factory Without Walls” (2006) in *Mute Magazine*, by Brian Ashton (<http://www.metamute.org/editorial/articles/factory-without-walls>; see also <http://www.labournet.net/docks2/0703/logistics1.htm>)

- Read excerpts from *Wal-Mart: The Face of 21st Century Capitalism* (2006) edited by Nelson Lichtenstein
- Read “Pulling the Plug: Labor and the Global Supply Chain” (2007) in *New Labor Forum* by Edna Bonacich
- Review maps and charts in “The Cargo Chain: Workers Who Make Our Economy” (2008), produced by a collaboration of The Center for Urban Pedagogy, *Labor Notes*, and The Longshore Workers’ Coalition (<http://welcometocup.org/cargochain.pdf>)
- Watch *Is Wal-Mart Good for America?* on PBS’ Frontline (can be viewed online: <http://www.pbs.org/wgbh/pages/frontline/shows/walmart/view/>)

## MODULE FOUR

### *Internationalist Class Struggle Across Borders and Oceans*

- Read “On the Front Lines of the World Class Struggle: The Cargo Chain” (March, 2010), *CounterPunch* by JoAnn Wypijewski (<http://lwcjustice.org/wp-content/uploads/counterpunch-on-cargo-chain-march-2010.pdf>)
- Read “Offshoring US Transportation Jobs to Mexico – The Looming Deadline” in *Monthly Review*, (2006) Volume 57, Issue 09 (February) by Richard Vogel ([http://combatingglobalization.com/articles/Offshoring\\_US\\_Transportation\\_Jobs\\_to\\_Mexico-The\\_Looming\\_Deadline.html](http://combatingglobalization.com/articles/Offshoring_US_Transportation_Jobs_to_Mexico-The_Looming_Deadline.html))
- Read “North American Free Trade Zones (FTZs): Undermining US and Canadian Transportation Workers” from a LaborFest presentation on July 19, 2009 at ILWU Local 6 Hall in San Francisco ([http://combatingglobalization.com/articles/north\\_american\\_free\\_trade\\_zones.html](http://combatingglobalization.com/articles/north_american_free_trade_zones.html))
- Read “Logistics and Opposition” (August 2011) in *Mute Magazine*, Vol. 3 No. 2 by Alberto Toscano (<http://www.metamute.org/editorial/articles/logistics-and-opposition>)
- Read “Supply Chains in Capitalism Today: From Foxconn to Wal-Mart – From Longview to FamilyMart” (2012: work-in-progress) by Will Barnes and Gifford Hartman
- Read “Eight Days in May” (2004) Daniel Borgström's account of the 8-day wildcat action at the Port of Oakland's APL gate in 2004 (<http://danielborgstrom.blogspot.com/2004/05/for-8-days-in-may-truckers-closed-port.html>)
- Watch *Race to the Bottom* (2008) 20-minute documentary about *troqueros* working the Port of Oakland

## MODULE FIVE

### *Web of Food Supply Chains*

Multimedia presentation:

#### **BREAD RIOTS Along Global Supply Chains: From Cairo to Longview**

The world's most bountiful wheat harvest ever was in 2008 yet bread riots broke out in 33 countries, adding in that year another 250 million to those without enough to eat everyday — pushing the world's "food insecure" to over 1 billion. Food as a percentage of total household consumption costs has reached 73% in Nigeria, 63% in Nigeria and 61% in the Ukraine. Bread riots in Egypt were preceded by the April 6, 2008 general strike of textile workers, who demanded higher wages to cope with wheat prices that had risen 130% (rice also went up 74%).

**Egypt is the world's leading wheat importer; the U.S. is the world's top wheat exporter.**

The Goldman Sachs Commodity Index of 18 foodstuffs was created in 1991 to allow speculators to invest in financialized futures on ingredients like hard red spring wheat, the world's most popular high-protein ingredient in bread. After the 2008 food bubble collapsed, 200 million bushels of wheat were sold for animal feed while hundreds of millions went hungry. As Asian countries become more affluent, they eat less rice and more meat and bread. EGT Corporation in Longview, Washington has built a rapid just-in-time grain delivery system to allow speculators to move wheat, corn and other grains for food and animal feed down global supply chains to growing markets in Asia. Japan is the world's #1 corn importer; the U.S. is the #1 exporter. EGT is doing what Wal-Mart does, but in reverse. Multinational food giants like EGT monopolize commodities from the farms of North America to food consumers across the planet. This multimedia presentation of recent struggles will be followed by an open discussion of ways we can contribute to the decommodification of not only food, but our lives and society as well.

- Read "The Food Bubble: How Wall Street starved millions and got away with it" by Frederick Kaufman (<http://frederickkaufman.typepad.com/files/the-food-bubble-pdf.pdf>)

- Read "It's the Baladi, Stupid" by Wendell Steavenson (<http://www.prospectmagazine.co.uk/magazine/wendell-steavenson-egypt-cairo/>)

- Further readings to-be-decided

- Watch *Revolution Through Arab Eyes: The Factory* (<http://www.aljazeera.com/programmes/revolutionthrougharabeyes/2012/01/201213013135991429.html>)

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*All of this is tentative. This would be done on a seminar model where participants could alter, add, delete, or modify any of the materials and topics as needed. Another proposed activity is physically following the supply chains to-and-from the ports, while ideally interviewing as many supply chain workers as possible.*

# Workers in a Lean World

## Unions in the International Economy



KIM MOODY



VERSO

London · New York

# The Rise and Limits of Lean Production

Lean production was born in Japan and developed to cope with a capital shortage caused by the devastation of World War Two. It was made possible by the repression of organized labor that occurred in the early 1950s.<sup>1</sup> Japan had been an industrial power since the turn of the (last) century. Defeated and destroyed during World War Two, however, the recovery of its industry and the welfare of its large corporations first got a boost into the world economy during the Korean War. The shortage of capital required its corporations to improve competitiveness and cut its costs through intensified work, longer hours, and a multi-tiered production chain with progressively lower wages. The defeat of the unions in the early 1950s provided the opportunity. As Taiichi Ohno, the creator of *kaizen* (constant improvement), himself put it, "Had I faced the (militant) Japan National Railways Union or an American union, I might have been murdered."<sup>2</sup>

Ohno, and others who followed his example to get competitive, modified the classic system of mass production first developed by Henry Ford. While the term "lean production" is frequently used in counterposition to mass production, as in the MIT International Motor Vehicles Program (IMVP) group's *The Machine that Changed the World*, it is in fact streamlined mass production that draws more consistently on the knowledge of the workers to do the streamlining. Practitioners of lean production tend to view it this way. Peter Enderle, Manufacturing Director of Adam Opel AG (GM) in Germany, put it like this in a company brochure about the "Opel Production System" at the new Eisenach assembly plant in eastern Germany:

Lean Production – this calls for a combination of the specific features of manual skill and the benefits of mass production. Manual skill ensures a high level of flexibility and high employee capabilities whereas mass production on the assembly line ensures benefits such as rapid throughput times and low unit costs.<sup>2</sup>

Lean production produces high-volume output through the standardization of product and process beyond Henry Ford's wildest dreams. It attempts to capitalize on economies of scale (output per unit of capital) as much as the more fashionable economies of scope (ability to produce different products with the same unit of capital) associated with flexibilization. Real flexibility in lean production lies primarily in the combination of information-age technology and worker experience with archaic forms of work organization such as contracting-out, casualization, old-fashioned speed-up, and the lengthening of working time.

Nor is there anything particularly "post-Fordist" about lean production other than the tendency to decentralize the production chain. The term itself, which refers to mass assembly-line production, was first used by the Italian Marxist Antonio Gramsci in his famous *Prison Notebooks*. One of his keener insights was that Ford's policy of paying above industry-standard wages of \$5 a day in the 1920s was primarily a way to end the high levels of labor turnover produced by the inhuman rigors of his assembly line.<sup>3</sup> In that sense, of industry paying relatively high wages for highly intense, routine work, most industries that ever qualified are still "Fordist." While wage restraint is typical these days, wages are seldom the major target of cost-cutting. In any case, lean methods are directed at producing for mass markets whether they are producing cars, refrigerators, telecommunications services, or semiconductors. In this sense, they remain "Fordist," as that term is most commonly used.

Indeed, to a much greater extent today than at the height of "fordism" in the 1950s, lean facilities are producing for world markets. It is also worth bearing in mind that most of the techniques associated with "fordism," notably the labor-intensive assembly line, along with the "scientific management" design of jobs through time-and-motion measurement, remain in practice today from Toyota City to Eisenach, Germany. Indeed, the world's only genuinely "post-Fordist," team-assembled auto-production facility, Volvo's Uddevalla, Sweden, plant, was deemed uncompetitive and closed in 1993 after only four years in operation.<sup>4</sup>

While lean production has brought some near-qualitative innovations, such as the enormous reduction in die-changing time in the auto industry, most new efficiencies involved in *kaizen* are quantitative or even marginal. Most aspects of lean production, such as extensive outsourcing and the

just-in-time parts-delivery system that lies suppliers to assemblers, are quantitative cost-cutting measures in the context of value maximization. Even with competition driving more and more firms to adopt lean methods, it is doubtful that anything they achieved in the past twenty years can match the 8 to 1 reduction in labor hours per car wrought by Henry Ford with the introduction of the moving assembly line.<sup>5</sup> Indeed, according to one study, the number of hours per car in Japan fell by less than a 2 to 1 ratio from 1970 through 1988.<sup>6</sup>

### Management-by-Stress

There is a lot of hype about lean production. Nowhere more than in the MIT IMVP group's *Machine that Changed The World*, where they claimed that Toyota's Japan plants produce "with half the amount" of labor and materials of North American or European plants.<sup>7</sup> Other researchers have criticized the MIT group's methods and figures, but the promoters of lean production everywhere continue to praise the system's efficiency.<sup>8</sup>

Few dispute that, on average, Japanese auto (and possibly other, less studied) plants were more efficient in the late 1980s than most of those in Europe or North America – though, as the methods spread, this may no longer be the case. The question is, however, what made them more efficient? Part of the answer lies in what can be seen at Toyota's Tahara, Japan, assembly plant 4 – it is more automated than most North American or European plants, although they too are moving in this direction.<sup>9</sup> More automation, fewer labor hours – it's simple arithmetic. But automation is not necessarily cost-cutting, since it is itself a substantial cost. Nor was automation a stranger to classical mass production – although some types, such as robotization, are fairly new.

What is different about lean methods is the continuous search for marginal improvements in costs by constantly stressing and readjusting the production system and, above all, the labor process. Lean production is run by a system of "management-by-stress," a term coined by Mike Parker and Jane Slaughter of *Labor Notes*. *Kaizen*, just-in-time, multiskilling, job rotation, teams, quality management, numerical and functional flexibility, extensive outsourcing, and all the well-known features of lean production are the means to reduce the resources, including labor, needed to produce a given product or service. This is done by a constant process of stretching one phase of production to the "breaking point" by reducing the number of workers and/or the mass of materials available, and then recalibrating the other phases of the production process.<sup>10</sup>

Efficiency and improvement are defined as cost reduction – as they

always have been. A training manual from the GM-Suzuki joint venture CAM1 assembly plant in Ingersoll, Ontario, Canada, put it succinctly: "Kaizen must always be tied to concrete cost reductions."<sup>12</sup> While minimizing materials through just-in-time (JIT) delivery or design-for-manufacturing is important, in practice, cost reduction most frequently applies to labor. In particular, getting lean means eliminating as much non-value-added labor time as possible. The Canadian Auto Workers (CAW) describe this as follows:

All costs associated with non value added functions are waste and are to be eliminated, whether it is buffers between operations, slack time, waiting time, walking space at work stations or more generally indirect labor such as the skilled trades.<sup>13</sup>

While most of the popular literature emphasizes the role of teams and workers' empowerment, the basic methods of reducing time are those of classical Taylorism or "scientific management," whether in Japan, North America, or Europe.<sup>14</sup> The notion that Toyota or anyone else abandoned what is essential in Taylorism is simply mistaken. In fact, jobs are timed and re-timed, designed and redesigned using the same time-and-motion tools. The reduction of labor time it takes to make a product applies not only to eliminating non-value-added jobs, but to eliminating rest times by workers performing value-added work. Breaks are reduced to the absolute minimum and the "pores" of working time are filled in. Whereas an assembly-line worker at GM's old mass-production plants worked (was in motion) 45 seconds of each minute, today's NUMMI workers in California work the standard Toyota 57-second minute.<sup>15</sup>

Nor is the fact that workers participate in this process by sharing their knowledge of the job something different than Taylorism. Taylor himself said that "scientific management" required:

the deliberate gathering in on the part of management's side of all the great mass of traditional knowledge, which in the past has been in heads of workmen, and in the physical skill and knack of the workmen, which they have acquired through the years.<sup>16</sup>

What is different is that in the early years of the Toyota system workers had been required to make this knowledge and skill known to management on a regular basis. In general, teams are one way in which this transfer of knowledge takes place, but the outcome is not worker empowerment or autonomy: it is highly standardized work timed down to the last breath. Tayloristic job-cycle times, for example, are essential to the Japanese

versions of lean production and the authority to make the changes remains in management's hands.<sup>17</sup>

The quality "movement," as some call it, has increased the emphasis on standardization of tasks in lean production and, hence, on management control of the labor process. As used by its theorists and practitioners alike, "quality" does not mean excellence or durability, or any particular characteristic of the final product – except that it conforms to the specifications laid down by management. Indeed, the concept of "conformance to requirements" is central to this version of quality and applies to the production process. Like lean production generally, it means cutting costs, in this case by eliminating mistakes in production – zero defects. While this might sound benign, it means that work must conform to requirements, standards, etc.<sup>18</sup> Conformity, not creativity, is the goal. Under these circumstances, not even theoretically autonomous work groups have anything like real autonomy.

Writers of the Human Resources Management (HRM) school tend to emphasize the "empowerment" and participatory side of lean production. This academic field, however, differs from industrial relations, sociology, or economics, in that it has no particular methodology other than the survey, while its studies "tend towards prescription rather than description."<sup>19</sup> It tends to be vague, propagandistic, and biased against independent trade unionism. As another industrial relations scholar put it:

HRM is best seen as a cultural construction facilitating the management of meaning. As a virtual reality, the projected identity of HRM has much in common with a hologram: as we move around the image different facets of its contoured and contradictory nature becomes visible. This helps to explain why, conceptually, it appears to be an evolving moving target, and why, empirically, it has no fixed (or fixable) form. As argued elsewhere, this "brilliant ambiguity" is necessary to its socio-cultural objective: to undermine, if not destroy, the institutional basis of collectivism and legitimate the transition to an individualized unitary concept of the employment relationship.<sup>20</sup>

The ideology of HRM actually runs up against the real imperatives of lean production. HRM propagandists seem to believe the hype about worker autonomy and empowerment. Their emphasis is on how teams, broad job definitions, rotation, pay for knowledge, etc., transcend Taylorism. One Canadian HRM study, for example, uses a 1991 Ernst & Young survey showing the proportion of companies using "cycle time analysis" and "process simplification" (deskilling), both "associated with traditional or 'Taylorist' approaches to work organization," as evidence that changes to new ways of working are "not widespread."<sup>21</sup> The survey shows that 74%

of firms questioned in Japan use cycle-time analysis and 82% process simplification. The comparable figures for the US are 60% and 47% respectively, while in Germany, where lean production had barely a foothold in 1991, they were 47% and 34%.<sup>27</sup> What the HRM specialists have failed to understand is that Tayloristic methods actually increase with lean production.

What is becoming clearer is that the teams are no longer regarded as necessary once the dynamics of management-by-stress are at work. Much of the cluster of programs that defines the HRM "model," in particular, is simply a means to cost reduction, discarded when the workers have disclosed what they know and a better method is found. This was made clear at Toyota's Tahara plant by the personnel director, who confirmed that management, not teams, directed job design, workflow, and everything else at Toyota. When sweeping changes were made at Tahara in 1992, the teams were not even consulted. In fact, the teams no longer functioned at all by 1994.<sup>28</sup>

Far from finding genuine participatory management, even where teams existed, a 1990 survey of manufacturing firms in the US Midwest concluded, in fact, that:

The results suggest that there are diverse ways for participative programs to relate to these new techniques. Perhaps more important, there are a significant number of cases where neither workers nor their unions were involved in the implementation of these programs. Further, when unions are involved in implementing these techniques, this involvement tends to be over traditional matters such as wages and job classifications and through the traditional process of collective bargaining. All of these results cast serious doubt on the extent to which management is in fact becoming more participative and labor relations more cooperative.<sup>29</sup>

Things are not so different in Germany, where lean methods are more recent. At the Mannheim Mercedes Bus plant there are no teams, but, as one worker put it, there is "clandestine kaizen." That is, jobs are constantly recycled, tightened up, loaded up. Between 1992 and 1996 the workforce at the Mannheim plant was reduced from 15,000 to 10,000.<sup>30</sup>

As a study of the GM-Suzuki "greenfield" joint venture, CAMI (in Ontario, Canada) points out, in an auto-assembly plant teams don't really have much impact on the way cars are produced. The writers argue:

At CAMI, vehicles are still put together in the traditional way pioneered by Henry Ford – all major assembly tasks follow the logic and pace of the drag line. Even sub-assemblies, such as those for the instrument panels, are built on moving lines. Hence, work at CAMI is not, for the most part, a team-

based production system, but a system of teams superimposed on a traditional assembly line operation in which output arises from the efforts of individual workers carrying out standardized tasks.<sup>31</sup>

David Robertson, research director of the CAW, made the point that teams no longer seem to be necessary to lean production in an address to German auto workers in 1994. He said:

Even if you resist teams, or quality circles, or other managerial initiatives or jointness in general it doesn't mean you have stopped lean production.<sup>32</sup>

Increasingly, management is using "competitive benchmarking" to change and eliminate jobs. As Robertson puts it:

Benchmarking studies try to find where it is that management does its best – the quickest, the cheapest, the fastest techniques and production practices.<sup>33</sup>

Benchmarking is an old practice and is, in fact, a basic piece of capitalist competition with a basis in political economy. As economist Howard Botwinick has argued, firms within a given industry must seek the best-practice levels of the industry's "regulating capital," the company with the lowest cost structure.<sup>34</sup> For years, Japanese producers have been the global regulating capitals in many industries and the source of emulation for other firms. But the actual conditions that make a company the regulating capital can change. Internationally, such non-production factors as exchange rates impact on costs and profit rates, placing a former regulating capital at a disadvantage in other markets, at least for a time.<sup>35</sup> This is precisely what happened to Japanese auto producers in the late 1980s into the 1990s. To rectify this, the former regulating capital must find new ways to cut costs, which was why management at the Toyota's Tahara plant 4 retooled and reconfigured the facility in 1992.<sup>36</sup>

Benchmarking is also the method by which lean "best practices" are diffused across borders within the TNCs. As with competition between firms, nationally and internationally, this internal benchmarking tends to produce a convergence of work and production practices even where the national industrial-relations systems and trade-union culture are very different. A United Nations report describes the process

The diffusion of best practice manufacturing and management methods under integrated international production ... could result in a cross-border convergence of work organization and conditions and quality of employment within integrated TNCs. If production is tightly co-ordinated across



affiliates in different countries, each one of them would be under pressure not to diverge from global (or regional) best practice.”

This effect is well documented in the automobile industry. As two British industrial-relations scholars note, however, it is common in most companies with strong central-management structures. They cite a European food multinational and ABB, a European producer of power transformers and auto parts. They give the following description:

ABB's power transformer business, for example, is introducing a "comprehensive set of benchmark metrics, measuring quality performance, on time delivery, customer satisfaction, productivity, inventory, manufacturing through-put time, as well as total through-put time."<sup>3</sup>

Whether through benchmarking, teams, or clandestine *karizen*, the outcome of management-by-stress is job reduction, on the one hand, and speed-up and job-loading, on the other. Interviews with auto workers from Renault in France (1994, 1996), Peugeot in France (1996) and the UK (1996), GM at Bochum (1994, 1996) and Eisenach (1996) in Germany and Ellesmere Port in the UK (1994), at Nissan (1994, 1996) and Volkswagen (1994, 1996) in Spain, Rover/BMW in Oxford, UK (1994); testimony at TTE auto-worker conferences in Germany and North America; as well as conversations with workers from dozens of plants in the US, Canada, and Mexico over the past several years, all reveal an identical tale of what happened when lean methods were introduced: substantial job elimination, with or without new technology; faster and harder work pace; and increased difficulty in handling grievances related to production or working conditions.<sup>4</sup>

Teams and quality circles do, of course, have a function that cannot be performed through benchmarking. They are a method of by-passing (or avoiding in the first place) the union and undoing the structures and rules created by "job-control" unionism – a misnomer that refers to the work rules, job descriptions, and other contractual limits on management's authority in workplace collective agreements. They also have an ideological function, which is to tie the workers and the union to the goals and objectives of the corporation – to inculcate the ideology of partnership in competitiveness. The widespread practice of "job-control" unionism in the US is one reason why teams are universal there. In Britain, the old traditions of workplace organization through shop stewards, coupled with extensive informal agreements and job demarcations, also encouraged management to use teamworking to undo what is left of these traditions. The series of strikes by British postal workers, one of the last groups with strong workplace organization, against the introduction of teams through

the autumn of 1996 were based on a clear understanding by the workers of the function of teams.<sup>5</sup>

Another method of dismantling workplace union rules or "restrictive" (for management) workplace practices involves the active embrace of the union and its integration into aspects of the company structure. Ironically, this sometimes begins when the union demands representation or consultation up the hierarchy of the company. In the auto industry in the US this became known as "jointness." Elly Leary and Marybeth Menaker, in *Jointness at GM: Company Unionism in the 21st Century*, show how the structure of joint company-union committees replicates the company structure and binds more and more of the union's own structure to the company. This corrodes union democracy, as more and more decisions about union policy and practice are made in high-level joint committees. More generally, it brings the union's independence from management into question.<sup>6</sup>

An almost as elaborate version of jointness exists between AT&T and the Communications Workers of America (CWA). Begun in 1993, the Workplace of the Future program featured joint boards and councils at every level of the company. The union was to be consulted about all major investment plans, cut-backs, downsizing, or other business changes. Its purpose was, as AT&T Vice President Bill Keichum said, "to secure the future – the future for the company, but also the future for the employees and the unions."<sup>7</sup> In fact, this scheme was put in place in 1993, only 5 months before AT&T announced its 4,000-person workforce reduction, a year before a proposed additional cut of 15,000 workers, and 3 years prior to the AT&T grand-slam, 40,000-job-reduction announcement. Each time, the union complained that the company had not consulted them.<sup>8</sup>

Another aspect of management-by-stress is the break up, the "vertical disintegration," of production processes previously performed within the same firm and often within a single complex. More and more of the work previously performed "in-house" is outsourced to other facilities, either belonging to the company or more commonly to allegedly independent contractors. Again, the CAW (Canadian Auto Workers) study put it well:

The differences between lean companies and other companies are not found in developments such as teams, suggestion programs, small group improvement activities, multiskilling or the like. The biggest differences are found in practices such as the massive outsourcing (contracting out) of parts and final assembly. The outsourcing is done with low wages, insecure employment and fully using production capacity.<sup>9</sup>

Extensive outsourcing was part of the original Toyota system. Production consisted of a pyramidal chain of facilities, with Toyota's "life-time"



employees composing as little as 25% of the workforce. Down the supplier chain there was no life-time job, and wages and conditions fell. At the bottom, women, almost totally absent from Toyota's "core" facilities, worked in low-tech, labor-intensive plants.<sup>40</sup> As labor costs rose across the board in the 1970s and 1980s, however, Toyota and other Japanese producers in many industries began "moving" a good deal of the work down the production chain, first to the four Asian Tigers, then to even lower-wage sites in the ASEAN countries, and now to China.<sup>41</sup> This pattern has been repeated in North America, with Mexico as a major site of outsourcing, and is now unfolding in the European Union, with North Africa and eastern Europe as outsourcing locations.<sup>42</sup> This is one of the ways in which the tendency toward international regionalization takes shape.

The measure of outsourcing is usually the amount of "content" in a product done "in-house." In the US auto industry much was made of the differences in the level of in-house content around 1990 between Chrysler (35%), Ford (45%), and GM (70%). More recent estimates, however, put GM's current in-house content closer to 49%, since its downsizing in the early 1990s. Ford had gone down to 39%, while Chrysler had slightly reversed its proportion of in-house work to 36%.<sup>43</sup> Toyota's in-house content was measured at 27% by the IMVP group.<sup>44</sup>

Outsourcing and the threat of outsourcing are the basis of introducing competition between workers in different plants both inside and outside of the company. In the US the union contracts in the auto industry allow local unions to join with local managers to "bid" on work against workers in another plant — a practice called "whipsawing." One GM worker described it like this:

Given an opportunity to "bid" against outside suppliers to keep work, many members spent countless hours analyzing the work process to develop innovative proposals to reduce cost and improve quality and service.<sup>45</sup>

In this particular case, GM outsourced the product anyway. In the process, however, the union members themselves had revealed to management how to speed up and load up their work.

The contracting out of work is not limited to manufacturing. Here's how one US truck driver and Teamster member described the process at his employer:

The trucking company where I'm employed frequently gives away my work. The freight goes to a fly-by-night local firm whose underpaid drivers are forced to lease their trucks from their boss and buy their own health insurance. And a day later, I'm laid off for lack of work.<sup>46</sup>

In manufacturing, lean outsourcing also involves a rationalization and reduction of the number of first-line suppliers. The IMVP group notes that during the 1980s US auto companies followed the Japanese example by reducing the number of direct suppliers from "a range of 2,000 to 2,500 at the beginning of the decade to between 1,000 and 1,500 at the end." They note that by that time the number of suppliers per assembly plant in the US was down to 509 in the US, and 442 in Europe, compared with 170 in Japan.<sup>47</sup> What this neat count of the supposed rationalization of the supply chain overlooks is that it is accomplished by the lead suppliers, in turn, outsourcing more production to even lower-paying suppliers, some of them in other countries.<sup>48</sup>

Flexibility is a major buzz word in lean production. While some writers emphasize the flexibility inherent in the new technology, it is the functional (deployment), numerical (staffing level), and time (scheduling) flexibility of the workforce that provides much of the cost reduction in the "core" of production.

Functional flexibility is achieved by the reduction or elimination of job descriptions or demarcations, whether inherited from Taylorism or embodied in the union agreements. This, of course, is one of the major differences between classical mass production and its lean variant — one of the few real, though only partial, departures from Taylorism. Functional flexibility also involves job rotation and the ability to work a number of different jobs. Usually labeled "multiskilling," this practice is more accurately called multitasking, since the actual jobs are simple standardized tasks that are really part of deskilling in the classical Taylorist manner.<sup>49</sup> In Britain, Canada, and the US, this has required an intense offensive by management against traditional forms of "job control", whereas in continental Europe weaker traditions of workplace organization and bargaining, along with the cooperative ethos of works councils in some countries, have made it easier.<sup>50</sup>

Time or scheduling flexibility is meant to allow round-the-clock operations in order to utilize fully the firms' capital assets with as few workers as possible. It is also a buffer for market fluctuations. Time flexibility is found in new forms of shift scheduling and rotation and in the massive use of overtime, sometimes without overtime pay.<sup>51</sup> The lengthening of the work day through overtime is another of lean production's archaic forms of increasing exploitation. But, as part of the management-by-stress set-up, it has another use as well.

As the CAW argues, "Overtime is the buffer in lean production."<sup>52</sup> It has been used this way in Japan since the early days of lean production. Rather than hiring new workers, more overtime is scheduled. In the US, overtime and downsizing have gone hand-in-hand in the 1990s. When business is

slack, overtime is reduced. In Europe, where average working hours tend to be shorter than in the U.S., the trend is toward "annualized hours" or "time corridors" that allow management to work shifts of thirty hours for part of the year and forty or more in other parts of the year. Premium pay for weekends and overtime are often eliminated under these systems.<sup>55</sup>

Overtime frequently accompanies and eases the way for downsizing through re-engineering. This is particularly the case in telecommunications. At NYNEX's Switching Control Center in New York City, for example, the workforce went from sixty-five technicians and three clerks in 1989 to twenty-seven technicians and one clerk in 1994. This occurred during the transition to digital switching, which actually created more work. While this was going on workers reported working as many as twelve to sixteen hours a day, and on weekends.<sup>56</sup>

Lean production's most recent innovation, one that did not originate in Japan, is the imposition of new shift systems designed to keep a facility in operation on a 24-hour basis. An OECD study on new scheduling patterns describes the economic motivation as follows:

In recent years, plant utilization time has been considerably extended in most industrialized countries. The reasons for this increase in operating hours are primarily increasing capital intensity and the accelerating pace of technical change. As capital intensity increases, firms can considerably reduce capital unit costs by extending operating hours. Furthermore, the capital employed is amortized more rapidly, with a consequent reduction in the risks associated with large-scale investments.<sup>57</sup>

The OECD report goes on to show that firms are solving this utilization problem by using "a range of new instruments, including working through breaks, staggered operating hours on expensive machines, a combination of full-time and part-time shifts, variations of annual shut-down times, and multiple job holder systems."<sup>58</sup> While some continuous-process production systems have had rotating shift work since their birth, the new kinds of shifts being introduced in North America and Europe find a home in any kind of manufacturing setting.

Until recently, for example, virtually all auto-assembly plants in the world worked on a straight two-shift, five-day-a-week basis. Now, new shift patterns and other scheduling changes are being introduced across the industry. In North America, they tend to be known as "alternative work schedules" and involve three rotating crews working ten- or twelve-hour days, four days a week . . . plus a great deal of overtime, which extends the week to five or six days.<sup>59</sup>

Numerical flexibility is found in both contracting out and the extensive

use of casual labor – usually part-timers and temporary workers, or "fixed-term" or "zero-hour" contract workers as they are usually called in Europe. In the US temporary workers have long been thought of as extra office help. But, by the mid-1990s, Manpower, Inc. had replaced GM as the nation's largest employer, and the total number of temporary workers employed by personnel supply services had reached over two-and-a-half million by 1996.<sup>60</sup> Similarly, part-time jobs were associated with retail work or the growing service sector. By 1993, over 30% of part-time workers labored in manufacturing, construction, transportation, or utilities. While the vast majority of part-time workers are still women, women from 22 to 64 years of age have slightly decreased the rate at which they work part-time (45.2% to 44.6%), while the proportion of men in the same age group has doubled (3.7% to 8.1%).<sup>61</sup>

The chain of numerical flexibility stretches all the way to homework. While it is probably most prevalent in clothing production, it can be found at the end of the production chain even in the automobile industry. Most of all, it has become global, existing in the North, where it was thought to have disappeared years ago, as well as in the South. Sheila Rowbotham attributes its rise in the South to two major causes. She writes:

The growth of homeworking in the Third World has been partly because of industrial restructuring in which work not only for the local market but also for international export has moved to the cheapest sources. Homework has also grown because rising prices in Latin America and Africa have made it impossible to gain a livelihood for families even where the men are in formal employment.<sup>62</sup>

In fact, the same causes have brought the return of homework to the North. Rowbotham documents homework, and organizations of homeworkers, in the US, Canada, Britain, and Italy.<sup>63</sup>

Contracting, casualization, and homework are archaic forms of labor organization common in the nineteenth century. At that time they were virtually synonymous with "sweated labor." A British Royal Commission said in 1888 that sweating existed "very largely wherever the system of subcontracting prevails." At the turn of the century the Illinois Bureau of Labor Statistics further equated the two, saying, "sweating consists of farming out by competing manufacturers to competing contractors of the material, which in turn is distributed among competing men and women to be made up."<sup>64</sup> This is a reasonably accurate description of how lean production organizes its contractors and casual workers.

Of course, there are some differences. Temporary workers today are more likely to wait at a phone or visit a temp agency than line up at the

factory gate. Part-time workers may have permanent jobs and some may even prefer part-time employment, but it has been involuntary part-time employment driving the growth of part-time work since 1979.<sup>61</sup> Contract workers brought into the "core" operations are likely to be employed regularly by a contracting firm. And the chain of contractors and suppliers is likely to be electronically linked and even coordinated in a way sweatshops a hundred years ago never could be. As the shop stewards convenor at Peugeot's Ryton, UK, plant put it, "We're all wired up these days. If someone coughs in the office here, they hear it in Paris."<sup>62</sup>

Another example is AT&T in the US which runs a nonunion subsidiary called Transtech, which in turn contracts with Accustaff, a temp agency, to bring in 3,000 workers in its telemarketing operations. AT&T also contracted with Bell Atlantic for telephone-operator services, but then switched its contracts to a nonunion holding company called CFW. Both of these set-ups allow AT&T to exploit thousands of workers who are beyond union coverage, since they are not AT&T employees, and receive none of the health-care or retirement benefits of regular employees.<sup>63</sup>

The extent of part-time and temporary employment in Europe differs from country to country because of legislation limiting these practices in some and not in others. But the trend toward the increased use of "fixed-term" or "zero-hours" contracts and other forms of temporary work, as well as of part-time workers, is unmistakable. In the UK, the proportion of workers in part-time work rose from 16.4% in 1979 to 24.1% in 1995; for men it rose from 1.9% in 1979 to 7.7% in 1995; for women, who compose the majority of part-time workers everywhere, it went from 39% to 44.3%. In France the incidence of part-time work in the same period rose from 8.1% to 15.6%, in Germany from 11.4% to 16.3%, and in Canada from 13.8% to 18.6%.<sup>64</sup>

Italy and Spain present a different pattern. Part-time and temporary work was illegal in those countries until recently. In Spain, the explosion of temporary jobs after 1986, when the law was changed, filled much of the demand for workers in "contingent" or "atypical" jobs. Such temporary workers are everywhere in Spain. For example, at the Nissan assembly plant in Barcelona's Zona Franca there are 500 temporary workers on top of the 3,600 regular employees. Similarly, Telefónica, the partly privatized national phone company, is using increased numbers of temporary contract workers in the process of "commercialization" required by a European Commission Directive.<sup>65</sup> Indeed, Telefónica workers in Barcelona told the story of the "missing floor," a floor in the old telephone central office long thought to have been sealed off, where the union (Comisiones Obreras) discovered hundreds of temporary contract telemarketing employees that management had tried to conceal.<sup>66</sup> In Italy, neither temporary nor part-

time jobs have become as common as elsewhere, though part-time work has been on the rise, particularly among large retailers, where as much as 50% of the workforce is now part-time. Italy also has a large "informal" sector, which can provide some of the same flexibility associated with "legal" casualized work.<sup>67</sup>

Part-time work remains women's work. Although the rate at which men work part-time is rising at a faster rate almost everywhere, women still compose 70–90% of the part-time workforce across the developed industrial nations.<sup>68</sup> A large part of this employment is in traditional service and retail-sector jobs long populated by women. Many of these industries have grown, increasing the number of part-time women workers. What is more, retailing has dramatically changed across the industrialized world as late and weekend opening times become normal and giant retailing operations replace local small businesses.<sup>69</sup> But contracting and casualization in traditionally full-time types of work have also increased in manufacturing down the production chain, health care, telecommunications, graphic arts, and publishing.

The gendered distribution of much of this "atypical" or casualized work has often been described as offering flexibility for women. One British study, however, puts the question of whose flexibility is at stake in context. It argues

Clearly atypical work does give some options to women with caring responsibilities unable to take typical work but that does not mean that it is meeting equally the flexibility needs of both employers and atypical workers. Indeed in some ways the flexibility which employers gain through atypical working serves to impose rigidities on workers: the homeworker constantly waiting for work and having to fit in with suppliers' delivery and collection schedules; the "On-call" part-timer not knowing when work will be available and afraid to refuse work when offered; the part-time worker required to vary hours at short or no notice, and the arrangement of hours which are less than ideal for many women trying to wrestle with paid work and domestic commitments.<sup>70</sup>

Not all contract workers are part-time or temporary. Industries as diverse as oil refining and telecommunications bring in contract workers who are regularly employed by a contract firm. Like outsourcing, this is a form of numerical flexibility. This type of contract worker is appearing in manufacturing plants, as well as service industries, around the world. For example, independent contracting firms do all the internal transport and inventory management at Rover BMW in Britain and at SEAT VW in Matorell, Spain.<sup>71</sup> At GM's Zaragoza assembly plant in Spain, an independent company makes seats inside the GM plant.<sup>72</sup>

This kind of insular subcontracting is increasingly a characteristic of "greenfield" lean plants. At GM's Opel assembly plant in Eisenach, Germany, for example, 700 workers, a third of the workforce, are employed by 28 outside contractors. Since these workers are not GM employees they are not represented on the works council or by the plant union. In-bound permanent contract workers will also be a feature of Volkswagen's new plant in Argentina where workers from twenty-four different firms will work side-by-side in the same facility, producing the same cars. This is the work of J. Ignacio López de Arriortua, the outsourcing wizard, who jumped from VW to GM and back to VW, spreading the doctrine of maximum outsourcing and contracting, but also of forcing contractors to adopt lean methods leading to "reductions in investment, direct labor, floor space and set-up time."<sup>71</sup>

Numerical or staffing flexibility and time or scheduling flexibility work together as an essential part of any genuinely lean production system. An OECD study described it well in a discussion of new trends in Germany that would apply almost anywhere:

"Flexible staffing" in the quasi-outsider segment of the company labor market, and "flexible scheduling" among the insiders seem to increasingly represent the standard method of absorbing fluctuations in the volume of work. If such fluctuations occur, first, temporary employees are usually withdrawn and fixed-term contracts allowed to run out; second, if necessary, the labor input in the firm or in certain departments is further reduced by phasing out overtime, introducing short time work or lengthening holiday periods; and third, natural attrition is no longer offset by replacements.<sup>72</sup>

The only qualification needed here is that short-timing or lengthening of holidays would be unlikely in North America.

If this flexibility is combined with functional flexibility, speed-up and job loading, which is itself constantly increased through management-by-stress, it is evident that a firm's employment will shrink not only with cyclical market declines, but more or less continuously over time even if the market holds up or expands. More precisely, the "core," once-upon-a-time beneficiaries of "life-time employment," will shrink in numbers, while insecure part-time, temporary, and contract employment will, as a result, grow throughout society.

Finally, lean-production methods, like mass production when it first spread, will be imitated and partially implemented in all kinds of employment settings. Subcontracting to lower-wage firms can even be a cheap substitute for genuine lean methods and certainly for technological innovation. The decentralization of the labor process and diffusion of casualized jobs, involuntary part-time employment, and "sweated" subcontracting,

which are the cheapest forms of "lean" cost-reducing, particularly in labor-intensive manufacturing or service industries, has clearly increased. Indeed, industries like clothing and semiconductors are based on this sort of extended chain of low-wage, mostly female, labor.<sup>73</sup> Whether it is implemented fully or partially, given different names, or modified by workers' resistance (as it frequently is), the basic features of lean production as developed in the automobile industry in Japan have become perceived as the global best practices in one industry after another and have spread across the world.

### The Spread of Lean Production

There is not much doubt that competition is the driving force behind the spread of lean production globally and some version of benchmarking a common method of emulation. Nevertheless, since lean production is not identical from company to company even in Japan, there are a number of versions to be emulated. Furthermore, different kinds of production systems (service delivery, continuous-process manufacturing, etc.) call for different mixes of lean techniques. Worker and/or union resistance is also an important factor in modifying lean systems. For example, the unions at the greenfield SEAT VW plant in Matorell, Spain, struck eighteen times to prevent teamworking, and management surrendered. Yet, in most other respects the Matorell plant is a lean facility.<sup>74</sup> Finally, as will be discussed below, lean production has its own built-in limits. Japanese firms have abandoned or modified some earlier practices. Not surprisingly, a 1993 British study found that British or North American firms in the UK tended to use more lean practices than Japanese-owned enterprises there.<sup>75</sup>

Measuring the extent of lean-production practices in any country is further complicated by the fact that much of this work is done by people working in the HRM field. HRM advocates measure the extent of change by the proportion of firms using some or all of the participation programs, broad job definitions and rotation, performance-related pay schemes, and sometimes functional flexibility that are part of most versions of the HRM "model." Merely scanning industry for these forms of work organization often overlooks the reality of lean production in the standardization of work, the force of just-in-time linking of jobs and facilities in driving work, or the undermining of conditions through extensive contracting out. With this warning in mind, however, some of the HRM studies provide an idea of the extent of lean practices.

Using extensive survey material (i.e., asking management what they

do), Paul Osterman of MIT shows that in 1994 over half of all US firms surveyed used teams, while about 40% used quality circles (QC), and a third had TQM (total quality management) programs. Asked more vaguely about employee involvement, over 80% who answered a 1991 Harris poll said they had "significant" or "some," but this would probably include those with old-fashioned suggestion programs. About one-third of firms reported having two or more new practices such as employee participation, quality (QC or TQM), or job rotation.<sup>80</sup> Larger companies are more likely to have one or another participation program than small ones: A survey of Fortune 1,000 companies showed that the proportion of them having one or more employee participation programs grew from 70% in 1987 to 85% in 1990.<sup>81</sup>

A deeper measure is found in a 1990 survey of eighty-five manufacturing firms in the US Midwest. The survey measured the use of just-in-time (JIT), statistical process control (SPC), total quality (TQ), cell manufacturing, work teams, and employee involvement – a cluster of programs much closer to full lean production. Management answers indicated that the following percentage of firms used these techniques: employee involvement 79.6%, JIT 52.1%, SPC 79.2%, TQ 56.3%, cell manufacturing 31.9%, and work teams 31.3%.<sup>82</sup> The low occurrence of work teams is probably explained by the high incidence of "employee involvement," which is the name often used to cover *kaizen* activities. This is the case, for example, in steel. On this evidence, there seems to be a significant proportion of firms in the US attempting to implement programs associated with lean production.

In Canada, HRM-style measures show much less implementation of programs associated with lean production, with only 24% of firms having some kind of participation program in 1993.<sup>83</sup> There is not much doubt that this is due to the persistence of "job-control" unionism, resulting from greater opposition and resistance on the part of unions, and to the greater union density in Canada than in the US – 35% compared with 15%. Whereas in the US most union leaders have been willing to circumvent or even give up much of this contractual language, in Canada unions have been more resistant to any sort of concessions.<sup>84</sup> Nevertheless, testimony by workers and union officials in both auto and telecommunications in Canada indicate that, with or without employee participation or union approval, lean-production methods like JIT, SPC, TQ, re-engineering, and cell manufacturing are widespread in Canada, as are workforce reductions.<sup>85</sup>

In 1995, GM CEO (Chief Executive Officer) John Smith told the *New York Times*, "There's a real focus on getting lean in Europe among all the auto makers." While GM's North American operations were regarded as less

than lean, Smith had been president of GM's Saturn operation and then led the outsourcing trend in GM's European operations until 1988. Smith was allies in company politics with outsourcing guru 'Inaki' Lopez in Europe. In 1992, GM-Europe took another big step toward leanness when the state-of-the-art Eisenach assembly plant opened. Some estimates of the cuts in GM's European component operations' workforce go as high as 70%.<sup>86</sup> By the mid-1990s, GM had moved to trim drastically the workforce at many older assembly operations.

Britain was the beachhead of lean production in Europe, with the process accelerating after Nissan opened its Sunderland assembly plant in 1986, much as Japanese transplants and the NUMM and CAMI (Canada) joint ventures had accelerated the process in North America. Even before the plant was up and running, Nissan was able to get a deal from the conservative Amalgamated Engineers' and Electricians' Union that gave management complete control.<sup>87</sup> The plant was state-of-the-art and a model of competitive lean production – a best practice to be imitated. A 1991 survey of British manufacturing firms showed that, of those who replied, 72% used continuous improvement, 68% JIT, 59% SPC, 68% quality circles and 56% total-quality controls.<sup>88</sup> This could reflect the low cost of British labor compared with Japanese or the fact that manufacturers in Japan were beginning to modify or eliminate some features of lean production, as will be discussed later.

Under fire from the Thatcher government and restricted in action by new labor laws, resistance was difficult. While it was extensive in areas of traditional strength like auto, the general practice of British unions has been to move from "opposition to grudging acceptance."<sup>89</sup> By 1994 the Trades Union Congress had adopted a position favorable to HRM. The Transport and General Workers' Union, the major union in the car industry, had embraced HRM by 1996. A notable exception to this acceptance is seen in the 1996 strike of workers at the Royal Mail against the introduction of teams and other lean practices.<sup>90</sup>

In Europe, aside from Britain, traditions of workplace bargaining are weak. It was not until the 1970s that workplace organization and bargaining became general. Much of this was a result of actions by the state in the aftermath of the increased militancy of the late 1960s and early 1970s. By the 1980s, works councils and other consultative structures had become common on the continent. These were not *kaizen* teams or quality circles, but, as consultative bodies in the context of weak shopfloor bargaining traditions, they sometimes helped open the door to lean production in the 1990s.

In Germany, for example, one study describes the process by which quality circles and teams came to German industry as follows:



Some unions and works councils at first rejected such participation initiatives, especially quality circles, but in most cases they have now accepted them, and some representatives of the unions and works councils regard them as a first step towards "codetermination in the workplace."<sup>91</sup>

Not all German union and works council representatives hold such a positive view, however. Militant stewards and works councilors at GM's Bochum plant argued that the acceptance of teams and other lean measures, particularly massive job loss, was a matter of the national union's (IG Metall) policy, not theirs. They also pointed out that the works council is forbidden to strike or negatively affect the interests of the enterprise.<sup>92</sup> Its theoretical ability to veto major changes is, as Ulrich Jurgens points out, limited to: "(a) the selection of personnel in the case of layoffs, (b) the scheduling of overtime, and (c) changes in the system and determinants of wages and salaries."<sup>93</sup> While the works councils can and do attempt to bargain informally over other issues, they have no actual authority in areas such as work organization, workforce reduction (other than who goes and who doesn't, seniority not being a factor in Germany), or technology. Nevertheless, following the policy of the IG Metall they have signed agreements clearing the way for team work.<sup>94</sup>

The rapid introduction of lean-production methods into Germany is particularly significant because Germany was thought to have the high-tech, high-skills alternative – the "virtuous circle" of high-end markets, skilled labor, and codetermination. But the crisis of accumulation that finally hit Germany, along with the entrance of the Japanese into the European market (via the UK and Spain), changed all this. The recession of the early 1990s provided the crisis needed to make drastic changes.<sup>95</sup> The opening of the "greenfield" GM Opel assembly plant in Eisenach in eastern Germany provided the new benchmark. This is a model lean facility, with all the paraphernalia and, according to one shop steward, incredible "pressure on the workers."<sup>96</sup>

Despite the rapidity with which lean methods are being introduced throughout Germany's auto industry and elsewhere, the coming of lean production follows the pattern set in existing "brownfield" plants in the US and Britain in the 1980s and into the 1990s (following the standards set at "greenfield" transplants and various joint ventures such as Mazda and NUMMI). Lean production is often introduced piecemeal, though in fairly rapid succession, in older facilities. Frequently, major changes are introduced first in one department, or even one work station, at a time to minimize resistance.<sup>97</sup> Workforce reductions don't necessarily come as giant lay-offs, but through accelerated attrition aided by buyout and early retirement packages. This piecemeal, but rapid, means of going lean – the

pattern in auto and telecommunications industries in the US – makes resistance more difficult and union control over the process all but impossible.

The same pattern and problems were experienced in the UK after Nissan set the benchmark at its Sunderland plant in 1986. Speaking of the rapidly of change, British shop stewards at Ford's Dagenham plant wrote:

Within all this the unions have to some extent been overwhelmed. For example, stewards are supposed to be present at all problem-solving groups, but we don't have enough stewards to cover them.<sup>98</sup>

In France lean practices, including downsizing and outsourcing, spread rapidly. The unions, with weak workplace organization, did not mount opposition and the works councils set up under the 1982 Auroux Laws lacked the power to regulate the process. Furthermore, the unions were divided on the new work organization. The CFDT generally supported the changes, while the CGT was more suspicious, but not absolutely opposed.<sup>99</sup> By the early 1990s, it was estimated that there were 30,000 quality circles functioning throughout French industry – the largest number in Europe.<sup>100</sup> At both Renault and Peugeot, participation programs and productivity pay have helped pave the way for massive workforce reductions in recent years. In a startling move toward leanness, Renault's blue-collar workforce fell from 110,000 in the mid-1980s to 65,000 in 1996. This involved closing the old Boulogne-Billancourt assembly complex, which had once employed 35,000 workers, and replacing it with a "greenfield" lean plant at Cléon that employs 5,567 workers, while much of the parts production was moved to its other plants in Europe.<sup>101</sup> At Peugeot, which employs lean methods similar to Renault, the giant plant at Sochaux went from 32,000 in the 1980s to 19,500 in 1996, while that at Poissy went from 20,000 to 9,000.<sup>102</sup>

In Italy, the unions, particularly the CGIL (Confederazione Generale Italiana del Lavoro), have embraced the new work methods and not resisted "downsizing." The course of introducing more lean and flexible work and production organization was, however, somewhat different because of the existence of joint labor-management works councils set up under successive legislative efforts. This included the 1984 Protocol of the IRI, Italy's industrial state-holding company, which employs about 300,000 workers and tends to set standards for all industry. Workplace-level bargaining only started in earnest in the 1980s, following the disastrous defeat of the 1980 Fiat strike, and in the context of a drastic restructuring and modernization of Italian industry. The unions cooperated in this effort, creating a "de facto cooperation" that lent itself to the introduction of

workforce (numerical, functional, and time) flexibility and reductions, total quality management, and so on.<sup>103</sup>

Wherever one looks in the developed industrial capitalist world, and in most of the more industrialized countries of the South, lean-production methods are either the norm or rapidly spreading. While their implementation may be partial, haphazard or slipshod, and is almost certain to be modified once complete, the problems and pressures of this extension of mass production are being felt by the working class across the world. From being a "new way of working" that promised a more humane workplace, it has been revealed as a system of brutal work intensification and a means of by-passing or undermining unionism.

### "Unbundling" and Vulnerability

The lean-production, management-by-stress system, taken as a whole, has a tight internal logic. Its various pieces (knitwear, flexibility, outsourcing, JIT, etc.) are held together in a constant state of tension and flux designed to reduce the workforce and the overall cost structure of production. The tightening up of a job cycle in one part of the system should lead to a recalibration of the whole system. Conversely, a breakdown at any point in the total system of production, from assembly or service delivery down the production chain, will rapidly impact the entire system.

At the same time, this system did not spring forth intact overnight. It has evolved over time, is frequently implemented piecemeal, and continues to be modified as a result of internal breakdowns, market pressures, or worker resistance. Furthermore, there are considerable differences in how companies structure and implement lean production, even between Japanese companies like Suzuki and Toyota, for example.<sup>104</sup> In addition, national differences in economy or labor-relations laws also shape the way in which lean methods come to various countries to some extent. Indeed, looked at from the idealized viewpoint presented by the MIT IMVP group, lean production is as varied as earlier versions of mass production.<sup>105</sup>

The fact that the reality of lean production is not always in accord with its internal logic and that it varies in practice from firm to firm, country to country, and industry to industry has led some analysts to speak of "unbundling" the system. Steve Babson puts it this way:

Thus "unbundled," lean production can be taken as a variable mixture of discrete elements, selectively recombined on a case-by-case basis.<sup>106</sup>

The very fact that management is continually altering and modifying the system, not to mention constantly reorganizing itself, is testimony to the reality that the combinations that produce today's "best practice" are, to some extent, failures. Worker resistance of the everyday variety as well as the occasional visible struggle or dispute are a factor in these failures – as well as in potential successes.

In a discussion of lean methods in the European airline industry, Paul Blayton and Peter Turbull make the point this way:

There can never be "one best way" to convert potential into concrete labor and thereby make a profit, only different routes to partial failure, if for no other reason than the simple fact that any management strategy which seeks to exploit labor power will be contested.<sup>107</sup>

While productivity increases in the "core" and cost-cutting down the production chain are certain to remain a central goal of capital, there is nothing in the forces of global competition that dictates the 57-second minute versus the 45- or 50-second minute, 50- and 60-hour work weeks, or any particular speed of work where the workers and/or the union have the power to resist. Although the management-by-stress logic of lean production appears essential, even such central features as teams and just-in-time delivery have been modified.

Ironically, the very internal logic of lean production also makes it highly vulnerable to disruption, as its own practitioners and theoreticians recognize. Indeed, the MIT IMVP group argues that lean production must be a humane system precisely because it is "fragile." They say, "to make a lean system with no slack – no safety net work at all, it is essential that every worker try very hard."<sup>108</sup> The cooperation/competitiveness ethos of management-by-stress is, of course, meant to motivate such effort. But when, as inevitably happens for one or another group of workers, this ethos is shattered on the reality of work intensification, long hours, and health-threatening conditions, the fragility of the system becomes a weapon of resistance.

This vulnerability of the system's own logic has been demonstrated by the strikes at GM in the US that began in 1993. Each of these strikes began to close down other facilities across GM's tightly integrated production chain. The longer the strike, the more plants went down. The longest, the seventeen-day strike at two Dayton, Ohio, brake plants, closed all but one assembly plant across the US, Canada, and Mexico, along with scores of parts plants and independent supplier firms.<sup>109</sup>

It is not only the JIT link between plants that provides workers with a weapon of resistance. Even within a given plant, at least where a fairly

tight management-by-stress set-up prevails, disruption in one sector should be felt elsewhere in short order. Of course, this vulnerability of the system is not always apparent to the workers in any one sector or plant. But practice makes perfect in resistance as in production, and the practice of "mapping the workplace" in order to locate points of vulnerability can be applied to lean production's logic with telling results.<sup>10</sup>

A brief look at the difference in the 1996 bargaining with GM in the US, on the one hand, and Canada, on the other, provides a clear insight into the difference the union's stance and actions can have on deepening or resisting aspects of lean production. In the US, the United Auto Workers' leaders not only agreed to continue its "jointness" program with GM, to renew its "living agreement" approach, whereby top management and the pinnacle of the union hierarchy can change local working conditions (flexibility) at will, and to permit unbounded overtime and outsourcing, they also agreed to introduce a new element of wage flexibility granted earlier to Ford, allowing the pay of workers in its parts plants to fall behind those in assembly over time. Indeed, the new contract language virtually takes wages in parts plants out of the collective-bargaining sphere by granting GM the right to pay at the local "prevailing wage" of the top one-fifth of UAW members in a given area or of the top one-fifth of companies in that area. This formula breaks the sixty-year-old practice of a single union standard within the Big Three auto companies.<sup>11</sup>

The Canadian Auto Workers (CAW), bargaining with GM at the same time, made no such concessions and, in fact, won some gains on reduced annual work time. Whereas the UAW granted GM (and Ford and Chrysler) the right to cut their workforce by 5%, the CAW put a stop to outsourcing or any workforce reductions during the life of the contract. The UAW, of course, settled without a strike, while the Canadians struck for three weeks during which workers at GM-Canada's Oshawa, Ontario, fabrication plant seized the facilities for a day. Naturally, the strike in Canada closed plants down the JIT chain in the US as time went on.<sup>12</sup> The lesson here is that resistance matters, particularly when the union leadership is willing to stick to its guns, and that elements of lean production or competitiveness the company sees as essential can be stopped or modified. Struggle can begin to "unbundle" lean production.

### Limits to Lean I: Space-Time Tension

The MIT IMVP group sees lean production as universal salvation, at least for the world's automobile industry. What is increasingly clear, however, is that this streamlined mass production embodies many of the same

limitations as classical mass production, or, for that matter, any form of capitalist production, as well as some of its own. Aside from the resistance it inevitably engenders, these limits are of two kinds: a time-space tension in the organization of the production chain; and the reproduction of the accumulation crisis that induced the spread of lean methods in the first place.

Some of the difficulties of lean production lie in the organization and dynamics of the system itself. As Erica Schoenberger suggests, time is closely related to flexibility in the system, in that getting new products to market first has become one of the more important tactics in competition. She argues that the most important aspect is the reduction of product-development time. But this must be coordinated with actual production if the firm is to beat the competition to market. Just-in-time production facilitates this, but also introduces new spatial constraints.

In Schoenberger's view, this "first-to-market" strategy strongly implies two spatial characteristics of lean production: that final production be near the market in question; and that both the product-development and the production systems be within a workable geographic distance. Nothing, after the works of David Harvey, that the advances in transportation and communications had been adequate to solve time space problems for simple mass production, with its just-in-case delivery system. Schoenberger argues that the new emphasis on time as a competitive factor changes things.<sup>13</sup> She writes:

a new round of "time-space compression" has had, in my view, the unusual effect of repositing the problem of space for the system. In other words, the once-solved problem of distance has become unsolved again, and this despite the fact that the techniques and costs of transportation and communication have steadily improved. The old time-space strategy has become invalid, and a new one is being worked out in its place.<sup>14</sup>

The original solution to this problem in Japan was proximity – hence the construction of Toyota City, as well as a generally concentrated industrial belt across southern Japan. But, since then, both cost and market considerations have led the Japanese, with others following suit, to expand production chains geographically, on the one hand, and to locate new assembly facilities in the major markets of North America and Europe, on the other. This has involved a significant change from Japanese industry's export orientation, but also a new risk factor, considering the cost of sunk capital investments involved.

While Schoenberger sees a general tendency for production to return to the major countries of the economic North in order to be strategically



placed in each major Triad market and to reduce spatial separation within the production chain, there actually appear to be two contradictory sides to locational questions, at least in manufacturing. Cost and spatial considerations seem to be contradictory forces of attraction on firms engaged in extended lean production. Cost has a tendency to win out in the production chain, with component production moving toward lower-wage and -cost areas or even abroad; while the need to be inside each major market has drawn more and more final assembly, and, in its trail, supplier operations, to major centers of the Triad.

What this tension produces are successive waves of investment and outsourcing accompanied by the writing off or sale of older, less efficient facilities. Both the restructuring of the 1980s and the downsizing of the 1990s included this sort of change. This kind of flux in the production system is very disorienting for workers and their unions and gives the impression of the infinite mobility of capital discussed earlier. It is also, undoubtedly, a source of the constant management shake-ups that characterize this era, as well as the parade of "new" management fads (like buying a corporate "culture") and quality schemes. As the one-time effects on profits of early market entry or newly developed products or features wear off, management looks to place blame and develop yet another round of "innovative" marketing and production strategies. Whereas simple mass production was characterized by long-range planning, lean mass production necessarily produces a tendency toward short-sightedness and "short-termism."

In fact, this space-time contradiction helps reproduce capital's classic crisis of accumulation as new, often duplicate production systems are placed in the major economic regions. Ironically, the extensive outsourcing, often at considerable geographic distances, both reintroduces transport costs into the JIT chain, even as it reduces labor costs, and transfers to the supplier company a portion of the value added from which profits are extracted, compounding the crisis of accumulation.

### Limits to Lean II: The Crisis of Accumulation Compounded

The most fundamental limitation to lean production, however, lies in its own dynamics as a system of capitalist production. Indications that lean production did not mean the transcendence of capitalist crisis began to appear in its land of birth in the 1990s. With the world-wide recession of the early 1990s, lean production in Japan entered a period of crisis similar to that experienced by simple mass production in the West in the 1970s and 1980s. In 1993-94 many Japanese TNCs announced massive workforce

reductions, while Nissan announced it would close its new high-tech Zama plant.<sup>115</sup> Life-time employment came to mean that redundant "core" workers moved down the supply chain to lower-wage jobs, while supplier employees were laid off.<sup>116</sup> To be sure, this was partly a result of the world-wide recession of the early 1990s, but it was the first time in over two decades that such a recession had had a significant impact on the Japanese economy.

Japan had, in effect, repeated the experience of the US auto industry of a decade and a half earlier. First, its legendary productivity gains hit the wall in the 1980s. Whereas the average build hours per vehicle had fallen from 254 in 1970 to 139 in 1980, they only fell to 133 in 1986 and stayed there for the rest of the decade. While these figures are still lower than those for North America or Europe, the British analysts who compiled and calculated them conclude that "there is apparently an irreducible minimum of well over 100 motor sector labor hours in any car." These figures are particularly significant because they include labor hours in the component-supplier sector of the industry.<sup>117</sup>

To deal with this limitation and to move into the North American and European markets, Toyota and Nissan had invested heavily in new technology and expanded capacity in the 1980s - reversing the original capital-scarce strategy in order to remain competitive. Industry analyst Maryann Keller described Toyota's situation by the early 1990s:

Japan's struggling economy was only part of the headache. Toyota had just completed a massive spending binge that had stretched its resources. New factories in Tahara, Kyushu, Great Britain, and Kentucky, along with heavy investments in new models had dangerously raised fixed costs.<sup>118</sup>

What this suggests is that, in line with what was said above about increased investment, not only did Japan's once "leanest" auto producers face overcapacity, they also faced a crisis in their rates of profit. That is, accumulated investment was outrunning the growth of profits. The more they invested to improve competitiveness, the more they compounded the problem. Indeed, this is what the Japan Auto Workers' Federation report argued when it said, "the companies make only little profit."<sup>119</sup> The floor on build hours suggests there is no easy way out for Japanese auto makers.

Ironically, this problem is further compounded for Japan's auto companies precisely because of all the outsourcing of production that helped make them the low-cost "regulating" capitals. Extensive outsourcing means that the ratio of value added to sales (a proxy for the company's potential profit margin - though not profit rate) is low for Japan's assembler companies. Between 1983 and 1991, Japanese auto-assembler

firms averaged from 13% to 20% value added to sales ratios, compared with 28% to 38% for US auto companies.<sup>120</sup> This means that no matter how efficient or low-cost the Japanese industry is, the major assembler firms, Toyota, Nissan, Honda, etc., have a low pool of value added from which to glean profits. As they "share" work with other companies, they naturally must "share" the profits created by the labor that performs that work. In terms of the distribution of value added, material costs, and investment in new plant and equipment, very little has changed in the structure of the auto industry in the past twenty years.<sup>121</sup> What outsourcing and contracting have changed is the "ownership" pattern of the industry's production chain and, hence, of the value added from which profits accrue.

Furthermore, the assembly end of the industry is the most capital-intensive. For example, to use US figures for 1994, the assembly sector invested \$21,726 per production worker in new plant and equipment, while the parts sector invested only \$11,535 per production worker.<sup>122</sup> While there are fewer than ten major assembler firms in the US investing just over half of the annual total, there are literally thousands of independent auto-parts producers investing just under half the total, indicating that the difference in capital intensity between the assembly and parts firms is, in fact, enormous. As North American and European auto-assembler companies increase outsourcing to lower average production costs, they actually intensify the tendency of the rate of profit to fall. In effect, lean production's propensity to outsource and contract as much labor as possible is an unintended shot in the foot for the major producers of cars and trucks.

The Japanese industry's response through the mid-1990s has been mixed. Most of the TNCs were moving more and more production out of Japan, on the one hand, and putting cost-cutting pressures on their suppliers, on the other.<sup>123</sup> Toyota continued to expand capacity, while Nissan closed its greenfield Zama plant. Toyota, however, also began modifying some features of leanness. As mentioned, the teams went dormant at Tahara. Even more significantly, however, some buffers were built back into the assembly lines.<sup>124</sup> Indeed, it was reported in 1995 that Toyota was modifying its production system in a less than lean direction, allowing larger inventories, in order to deal with growing production problems.<sup>125</sup>

As the world market has recovered, Japan's auto companies have, reportedly, decided to reduce the content (and price) of their cars by stripping luxuries and other up-market features in hopes of regaining lost market share at home and abroad.<sup>126</sup> Assuming these features are produced by contracting supplier firms, this would increase the proportion of value added produced in-house and perhaps improve profitability somewhat. The down-side is that lower selling prices will reduce the amount of value

added per car unless these companies make some more productivity breakthroughs. It seems, however, that this has become more and more difficult at given levels of technology. This would imply a continued profitability crisis for lean production in its birthplace, soon to be replicated by imitators abroad.

The bad news, of course, is that the continued crisis of accumulation and the limits to further genuine innovation almost certainly mean even greater pressure on the workforce. One indication of this has been the return to the lengthening of work time in the US and elsewhere or various ways of chiseling on shorter work time in Europe as a way of increasing the value produced by the workers. Furthermore, the recipe for decentralizing production processes through the creation of extended production chains of progressively lower-paying work sites and casualized labor is contributing to a deepening social crisis of the working class that began over two decades ago and shows no sign of relenting.

## NOTES

### 5 The Rise and Limits of Lean Production

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# A Brief History of Neoliberalism

David Harvey



## Introduction

Future historians may well look upon the years 1978–80 as a revolutionary turning-point in the world's social and economic history. In 1978, Deng Xiaoping took the first momentous steps towards the liberalization of a communist-ruled economy in a country that accounted for a fifth of the world's population. The path that Deng defined was to transform China in two decades from a closed backwater to an open centre of capitalist dynamism with sustained growth rates unparalleled in human history. On the other side of the Pacific, and in quite different circumstances, a relatively obscure (but now renowned) figure named Paul Volcker took command at the US Federal Reserve in July 1979, and within a few months dramatically changed monetary policy. The Fed thereafter took the lead in the fight against inflation no matter what its consequences (particularly as concerned unemployment). Across the Atlantic, Margaret Thatcher had already been elected Prime Minister of Britain in May 1979, with a mandate to curb trade union power and put an end to the miserable inflationary stagnation that had enveloped the country for the preceding decade. Then, in 1980, Ronald Reagan was elected President of the United States and, armed with geniality and personal charisma, set the US on course to revitalize its economy by supporting Volcker's moves at the Fed and adding his own particular blend of policies to curb the power of labour, deregulate industry, agriculture, and resource extraction, and liberate the powers of finance both internally and on the world stage. From these several epicentres, revolutionary impulses seemingly spread and reverberated to remake the world around us in a totally different image.

Transformations of this scope and depth do not occur by accident. So it is pertinent to enquire by what means and paths the

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new economic configuration—often subsumed under the term ‘globalization’—was plucked from the entrails of the old. Volcker, Reagan, Thatcher, and Deng Xiaoping all took minority arguments that had long been in circulation and made them majoritarian (though in no case without a protracted struggle). Reagan brought to life the minority tradition that stretched back within the Republican Party to Barry Goldwater in the early 1960s. Deng saw the rising tide of wealth and influence in Japan, Taiwan, Hong Kong, Singapore, and South Korea and sought to mobilize market socialism instead of central planning to protect and advance the interests of the Chinese state. Volcker and Thatcher both plucked from the shadows of relative obscurity a particular doctrine that went under the name of ‘neoliberalism’ and transformed it into the central guiding principle of economic thought and management. And it is with this doctrine—its origins, rise, and implications—that I am here primarily concerned.<sup>1</sup>

Neoliberalism is in the first instance a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets, and free trade. The role of the state is to create and preserve an institutional framework appropriate to such practices. The state has to guarantee, for example, the quality and integrity of money. It must also set up those military, defence, police, and legal structures and functions required to secure private property rights and to guarantee, by force if need be, the proper functioning of markets. Furthermore, if markets do not exist (in areas such as land, water, education, health care, social security, or environmental pollution) then they must be created, by state action if necessary. But beyond these tasks the state should not venture. State interventions in markets (once created) must be kept to a bare minimum because, according to the theory, the state cannot possibly possess enough information to second-guess market signals (prices) and because powerful interest groups will inevitably distort and bias state interventions (particularly in democracies) for their own benefit.

There has everywhere been an emphatic turn towards neoliberalism in political-economic practices and thinking since the 1970s.

Deregulation, privatization, and withdrawal of the state from many areas of social provision have been all too common. Almost all states, from those newly minted after the collapse of the Soviet Union to old-style social democracies and welfare states such as New Zealand and Sweden, have embraced, sometimes voluntarily and in other instances in response to coercive pressures, some version of neoliberal theory and adjusted at least some policies and practices accordingly. Post-apartheid South Africa quickly embraced neoliberalism, and even contemporary China, as we shall see, appears to be headed in this direction. Furthermore, the advocates of the neoliberal way now occupy positions of considerable influence in education (the universities and many ‘think tanks’), in the media, in corporate boardrooms and financial institutions, in key state institutions (treasury departments, the central banks), and also in those international institutions such as the International Monetary Fund (IMF), the World Bank, and the World Trade Organization (WTO) that regulate global finance and trade. Neoliberalism has, in short, become hegemonic as a mode of discourse. It has pervasive effects on ways of thought to the point where it has become incorporated into the common-sense way many of us interpret, live in, and understand the world.

The process of neoliberalization has, however, entailed much ‘creative destruction’, not only of prior institutional frameworks and powers (even challenging traditional forms of state sovereignty) but also of divisions of labour, social relations, welfare provisions, technological mixes, ways of life and thought, reproductive activities, attachments to the land and habits of the heart. In so far as neoliberalism values market exchange as ‘an ethic in itself, capable of acting as a guide to all human action, and substituting for all previously held ethical beliefs’, it emphasizes the significance of contractual relations in the marketplace.<sup>2</sup> It holds that the social good will be maximized by maximizing the reach and frequency of market transactions, and it seeks to bring all human action into the domain of the market. This requires technologies of information creation and capacities to accumulate, store, transfer, analyse, and use massive databases to guide decisions in the global marketplace. Hence neoliberalism’s intense interest in and pursuit of information technologies (leading some



to proclaim the emergence of a new kind of ‘information society’). These technologies have compressed the rising density of market transactions in both space and time. They have produced a particularly intensive burst of what I have elsewhere called ‘time-space compression’. The greater the geographical range (hence the emphasis on ‘globalization’) and the shorter the term of market contracts the better. This latter preference parallels Lyotard’s famous description of the postmodern condition as one where ‘the temporary contract’ supplants ‘permanent institutions in the professional, emotional, sexual, cultural, family and international domains, as well as in political affairs’. The cultural consequences of the dominance of such a market ethic are legion, as I earlier showed in *The Condition of Postmodernity*.<sup>3</sup>

While many general accounts of global transformations and their effects are now available, what is generally missing—and this is the gap this book aims to fill—is the political-economic story of where neoliberalization came from and how it proliferated so comprehensively on the world stage. Critical engagement with that story suggests, furthermore, a framework for identifying and constructing alternative political and economic arrangements.

I have benefited in recent times from conversations with Gerard Duménil, Sam Gindin, and Leo Panitch. I have more longstanding debts to Masao Miyoshi, Giovanni Arrighi, Patrick Bond, Cindi Katz, Neil Smith, Bertell Ollman, Maria Kaika, and Erik Swyngedouw. A conference on neoliberalism sponsored by the Rosa Luxemburg Foundation in Berlin in November 2001 first sparked my interest in this topic. I thank the Provost at the CUNY Graduate Center, Bill Kelly, and my colleagues and students primarily but not exclusively in the Anthropology Program for their interest and support. I absolve everyone, of course, from any responsibility for the results.

## 1

## Freedom’s Just Another Word . . .

For any way of thought to become dominant, a conceptual apparatus has to be advanced that appeals to our intuitions and instincts, to our values and our desires, as well as to the possibilities inherent in the social world we inhabit. If successful, this conceptual apparatus becomes so embedded in common sense as to be taken for granted and not open to question. The founding figures of neoliberal thought took political ideals of human dignity and individual freedom as fundamental, as ‘the central values of civilization’. In so doing they chose wisely, for these are indeed compelling and seductive ideals. These values, they held, were threatened not only by fascism, dictatorship, and communism, but by all forms of state intervention that substituted collective judgements for those of individuals free to choose.

Concepts of dignity and individual freedom are powerful and appealing in their own right. Such ideals empowered the dissident movements in eastern Europe and the Soviet Union before the end of the Cold War as well as the students in Tiananmen Square. The student movements that swept the world in 1968—from Paris and Chicago to Bangkok and Mexico City—were in part animated by the quest for greater freedoms of speech and of personal choice. More generally, these ideals appeal to anyone who values the ability to make decisions for themselves.

The idea of freedom, long embedded in the US tradition, has played a conspicuous role in the US in recent years. ‘9/11’ was immediately interpreted by many as an attack on it. ‘A peaceful world of growing freedom’, wrote President Bush on the first anniversary of that awful day, ‘serves American long-term interests, reflects enduring American ideals and unites America’s allies.’ ‘Humanity’, he concluded, ‘holds in its hands the opportunity to



offer freedom's triumph over all its age-old foes', and 'the United States welcomes its responsibilities to lead in this great mission'. This language was incorporated into the US National Defense Strategy document issued shortly thereafter. 'Freedom is the Almighty's gift to every man and woman in this world', he later said, adding that 'as the greatest power on earth we have an obligation to help the spread of freedom'.<sup>1</sup>

When all of the other reasons for engaging in a pre-emptive war against Iraq were proven wanting, the president appealed to the idea that the freedom conferred on Iraq was in and of itself an adequate justification for the war. 'The Iraqis were free, and that was all that really mattered. But what sort of 'freedom' is envisaged here, since, as the cultural critic Matthew Arnold long ago thoughtfully observed, 'freedom is a very good horse to ride, but to ride somewhere'.<sup>2</sup> To what destination, then, are the Iraqi people expected to ride the horse of freedom donated to them by force of arms?

The Bush administration's answer to this question was spelled out on 19 September 2003, when Paul Bremer, head of the Coalition Provisional Authority, promulgated four orders that included 'the full privatization of public enterprises, full ownership rights by foreign firms of Iraqi businesses, full repatriation of foreign profits . . . the opening of Iraq's banks to foreign control, national treatment for foreign companies and . . . the elimination of nearly all trade barriers'.<sup>3</sup> The orders were to apply to all areas of the economy, including public services, the media, manufacturing, services, transportation, finance, and construction. Only oil was exempt (presumably because of its special status as revenue producer to pay for the war and its geopolitical significance). The labour market, on the other hand, was to be strictly regulated. Strikes were effectively forbidden in key sectors and the right to unionize restricted. A highly regressive 'flat tax' (an ambitious tax-reform plan long advocated for implementation by conservatives in the US) was also imposed.

These orders were, some argued, in violation of the Geneva and Hague Conventions, since an occupying power is mandated to guard the assets of an occupied country and not sell them off.<sup>4</sup> Some Iraqis resisted the imposition of what the London *Economist*

called a 'capitalist dream' regime upon Iraq. A member of the US-appointed Coalition Provisional Authority forcefully criticized the imposition of 'free market fundamentalism', calling it 'a flawed logic that ignores history'.<sup>5</sup> Though Bremer's rules may have been illegal when imposed by an occupying power, they would become legal if confirmed by a 'sovereign' government. The interim government, appointed by the US, that took over at the end of June 2004 was declared 'sovereign'. But it only had the power to confirm existing laws. Before the handover, Bremer multiplied the number of laws to specify free-market and free-trade rules in minute detail (on detailed matters such as copyright laws and intellectual property rights), expressing the hope that these institutional arrangements would 'take on a life and momentum of their own' such that they would prove very difficult to reverse.<sup>6</sup>

According to neoliberal theory, the sorts of measures that Bremer outlined were both necessary and sufficient for the creation of wealth and therefore for the improved well-being of the population at large. The assumption that individual freedoms are guaranteed by freedom of the market and of trade is a cardinal feature of neoliberal thinking, and it has long dominated the US stance towards the rest of the world.<sup>7</sup> What the US evidently sought to impose by main force on Iraq was a state apparatus whose fundamental mission was to facilitate conditions for profitable capital accumulation on the part of both domestic and foreign capital. I call this kind of state apparatus a *neoliberal state*. The freedoms it embodies reflect the interests of private property owners, businesses, multinational corporations, and financial capital. Bremer invited the Iraqis, in short, to ride their horse of freedom straight into the neoliberal corral.

The first experiment with neoliberal state formation, it is worth recalling, occurred in Chile after Pinochet's coup on the 'little September 11th' of 1973 (almost thirty years to the day before Bremer's announcement of the regime to be installed in Iraq). The coup, against the democratically elected government of Salvador Allende, was promoted by domestic business elites threatened by Allende's drive towards socialism. It was backed by US corporations, the CIA, and US Secretary of State Henry Kissinger. It violently repressed all the social movements and political



organizations of the left and dismantled all forms of popular organization (such as the community health centres in poorer neighbourhoods). The labour market was 'freed' from regulatory or institutional restraints (trade union power, for example). But how was the stalled economy to be revived? The policies of import substitution (fostering national industries by subsidies or tariff protections) that had dominated Latin American attempts at economic development had fallen into disrepute, particularly in Chile, where they had never worked that well. With the whole world in economic recession, a new approach was called for.

A group of economists known as 'the Chicago boys' because of their attachment to the neoliberal theories of Milton Friedman, then teaching at the University of Chicago, was summoned to help reconstruct the Chilean economy. The story of how they were chosen is an interesting one. The US had funded training of Chilean economists at the University of Chicago since the 1950s as part of a Cold War programme to counteract left-wing tendencies in Latin America. Chicago-trained economists came to dominate at the private Catholic University in Santiago. During the early 1970s, business elites organized their opposition to Allende through a group called 'the Monday Club' and developed a working relationship with these economists, funding their work through research institutes. After General Gustavo Leigh, Pinochet's rival for power and a Keynesian, was sidelined in 1975, Pinochet brought these economists into the government, where their first job was to negotiate loans with the International Monetary Fund. Working alongside the IMF, they restructured the economy according to their theories. They reversed the nationalizations and privatized public assets, opened up natural resources (fisheries, timber, etc.) to private and unregulated exploitation (in many cases riding roughshod over the claims of indigenous inhabitants), privatized social security, and facilitated foreign direct investment and freer trade. The right of foreign companies to repatriate profits from their Chilean operations was guaranteed. Export-led growth was favoured over import substitution. The only sector reserved for the state was the key resource of copper (rather like oil in Iraq). This proved crucial to the budgetary viability of the state since copper revenues flowed exclusively into its coffers. The immediate

revival of the Chilean economy in terms of growth rates, capital accumulation, and high rates of return on foreign investments was short-lived. It all went sour in the Latin American debt crisis of 1982. The result was a much more pragmatic and less ideologically driven application of neoliberal policies in the years that followed. All of this, including the pragmatism, provided helpful evidence to support the subsequent turn to neoliberalism in both Britain (under Thatcher) and the US (under Reagan) in the 1980s. Not for the first time, a brutal experiment carried out in the periphery became a model for the formulation of policies in the centre (much as experimentation with the flat tax in Iraq has been proposed under Bremer's decrees).<sup>8</sup>

The fact that two such obviously similar restructurings of the state apparatus occurred at such different times in quite different parts of the world under the coercive influence of the United States suggests that the grim reach of US imperial power might lie behind the rapid proliferation of neoliberal state forms throughout the world from the mid-1970s onwards. While this has undoubtedly occurred over the last thirty years, it by no means constitutes the whole story, as the domestic component of the neoliberal turn in Chile shows. It was not the US, furthermore, that forced Margaret Thatcher to take the pioneering neoliberal path she took in 1979. Nor was it the US that forced China in 1978 to set out on a path of liberalization. The partial moves towards neoliberalization in India in the 1980s and Sweden in the early 1990s cannot easily be attributed to the imperial reach of US power. The uneven geographical development of neoliberalism on the world stage has evidently been a very complex process entailing multiple determinations and not a little chaos and confusion. Why, then, did the neoliberal turn occur, and what were the forces that made it so hegemonic within global capitalism?

### Why the Neoliberal Turn?

The restructuring of state forms and of international relations after the Second World War was designed to prevent a return to the catastrophic conditions that had so threatened the capitalist order in the great slump of the 1930s. It was also supposed to



prevent the re-emergence of inter-state geopolitical rivalries that had led to the war. To ensure domestic peace and tranquillity, some sort of class compromise between capital and labour had to be constructed. The thinking at the time is perhaps best represented by an influential text by two eminent social scientists, Robert Dahl and Charles Lindbloom, published in 1953. Both capitalism and communism in their raw forms had failed, they argued. The only way ahead was to construct the right blend of state, market, and democratic institutions to guarantee peace, inclusion, well-being, and stability.<sup>9</sup> Internationally, a new world order was constructed through the Bretton Woods agreements, and various institutions, such as the United Nations, the World Bank, the IMF, and the Bank of International Settlements in Basle, were set up to help stabilize international relations. Free trade in goods was encouraged under a system of fixed exchange rates anchored by the US dollar's convertibility into gold at a fixed price. Fixed exchange rates were incompatible with free flows of capital that had to be controlled, but the US had to allow the free flow of the dollar beyond its borders if the dollar was to function as the global reserve currency. This system existed under the umbrella protection of US military power. Only the Soviet Union and the Cold War placed limits on its global reach.

A variety of social democratic, Christian democratic and dirigiste states emerged in Europe after the Second World War. The US itself turned towards a liberal democratic state form, and Japan, under the close supervision of the US, built a nominally democratic but in practice highly bureaucratic state apparatus empowered to oversee the reconstruction of that country. What all of these various state forms had in common was an acceptance that the state should focus on full employment, economic growth, and the welfare of its citizens, and that state power should be freely deployed, alongside of or, if necessary, intervening in or even substituting for market processes to achieve these ends. Fiscal and monetary policies usually dubbed 'Keynesian' were widely deployed to dampen business cycles and to ensure reasonably full employment. A 'class compromise' between capital and labour was generally advocated as the key guarantor of domestic peace and tranquillity. States actively intervened in industrial policy and

moved to set standards for the social wage by constructing a variety of welfare systems (health care, education, and the like).

This form of political-economic organization is now usually referred to as 'embedded liberalism' to signal how market processes and entrepreneurial and corporate activities were surrounded by a web of social and political constraints and a regulatory environment that sometimes restrained but in other instances led the way in economic and industrial strategy.<sup>10</sup> State-led planning and in some instances state ownership of key sectors (coal, steel, automobiles) were not uncommon (for example in Britain, France, and Italy). The neoliberal project is to disembed capital from these constraints.

Embedded liberalism delivered high rates of economic growth in the advanced capitalist countries during the 1950s and 1960s.<sup>11</sup> In part this depended on the largesse of the US in being prepared to run deficits with the rest of the world and to absorb any excess product within its borders. This system conferred benefits such as expanding export markets (most obviously for Japan but also unevenly across South America and to some other countries of South-East Asia), but attempts to export 'development' to much of the rest of the world largely stalled. For much of the Third World, particularly Africa, embedded liberalism remained a pipe dream. The subsequent drive towards neoliberalization after 1980 entailed little material change in their impoverished condition. In the advanced capitalist countries, redistributive politics (including some degree of political integration of working-class trade union power and support for collective bargaining), controls over the free mobility of capital (some degree of financial repression through capital controls in particular), expanded public expenditures and welfare state-building, active state interventions in the economy, and some degree of planning of development went hand in hand with relatively high rates of growth. The business cycle was successfully controlled through the application of Keynesian fiscal and monetary policies. A social and moral economy (sometimes supported by a strong sense of national identity) was fostered through the activities of an interventionist state. The state in effect became a force field that internalized class relations. Working-class institutions such as labour unions and political



parties of the left had a very real influence within the state apparatus.

By the end of the 1960s embedded liberalism began to break down, both internationally and within domestic economies. Signs of a serious crisis of capital accumulation were everywhere apparent. Unemployment and inflation were both surging everywhere, ushering in a global phase of 'stagflation' that lasted throughout much of the 1970s. Fiscal crises of various states (Britain, for example, had to be bailed out by the IMF in 1975–6) resulted as tax revenues plunged and social expenditures soared. Keynesian policies were no longer working. Even before the Arab-Israeli War and the OPEC oil embargo of 1973, the Bretton Woods system of fixed exchange rates backed by gold reserves had fallen into disarray. The porosity of state boundaries with respect to capital flows put stress on the system of fixed exchange rates. US dollars had flooded the world and escaped US controls by being deposited in European banks. Fixed exchange rates were therefore abandoned in 1971. Gold could no longer function as the metallic base of international money; exchange rates were allowed to float, and attempts to control the float were soon abandoned. The embedded liberalism that had delivered high rates of growth to at least the advanced capitalist countries after 1945 was clearly exhausted and was no longer working. Some alternative was called for if the crisis was to be overcome.

One answer was to deepen state control and regulation of the economy through corporatist strategies (including, if necessary, curbing the aspirations of labour and popular movements through austerity measures, incomes policies, and even wage and price controls). This answer was advanced by socialist and communist parties in Europe, with hopes pinned on innovative experiments in governance in places such as communist-controlled 'Red Bologna' in Italy, on the revolutionary transformation of Portugal in the wake of the collapse of fascism, on the turn towards a more open market socialism and ideas of 'Eurocommunism', particularly in Italy (under the leadership of Berlinguer) and in Spain (under the influence of Carrillo), or on the expansion of the strong social democratic welfare state tradition in Scandinavia. The left assembled considerable popular power behind such programmes, coming close to power in

Italy and actually acquiring state power in Portugal, France, Spain, and Britain, while retaining power in Scandinavia. Even in the United States, a Congress controlled by the Democratic Party legislated a huge wave of regulatory reform in the early 1970s (signed into law by Richard Nixon, a Republican president, who in the process even went so far as to remark that 'we are all Keynesians now'), governing everything from environmental protection to occupational safety and health, civil rights, and consumer protection.<sup>12</sup> But the left failed to go much beyond traditional social democratic and corporatist solutions and these had by the mid-1970s proven inconsistent with the requirements of capital accumulation. The effect was to polarize debate between those ranged behind social democracy and central planning on the one hand (who, when in power, as in the case of the British Labour Party, often ended up trying to curb, usually for pragmatic reasons, the aspirations of their own constituencies), and the interests of all those concerned with liberating corporate and business power and re-establishing market freedoms on the other. By the mid-1970s, the interests of the latter group came to the fore. But how were the conditions for the resumption of active capital accumulation to be restored?

How and why neoliberalism emerged victorious as the single answer to this question is the crux of the problem we have to solve. In retrospect it may seem as if the answer was both inevitable and obvious, but at the time, I think it is fair to say, no one really knew or understood with any certainty what kind of answer would work and how. The capitalist world stumbled towards neoliberalization as the answer through a series of gyrations and chaotic experiments that really only converged as a new orthodoxy with the articulation of what became known as the 'Washington Consensus' in the 1990s. By then, both Clinton and Blair could easily have reversed Nixon's earlier statement and simply said 'We are all neoliberals now.' The uneven geographical development of neoliberalism, its frequently partial and lop-sided application from one state and social formation to another, testifies to the tentativeness of neoliberal solutions and the complex ways in which political forces, historical traditions, and existing institutional arrangements all shaped why and how the process of neoliberalization actually occurred.

There is, however, one element within this transition that deserves specific attention. The crisis of capital accumulation in the 1970s affected everyone through the combination of rising unemployment and accelerating inflation (Figure 1.1). Discontent

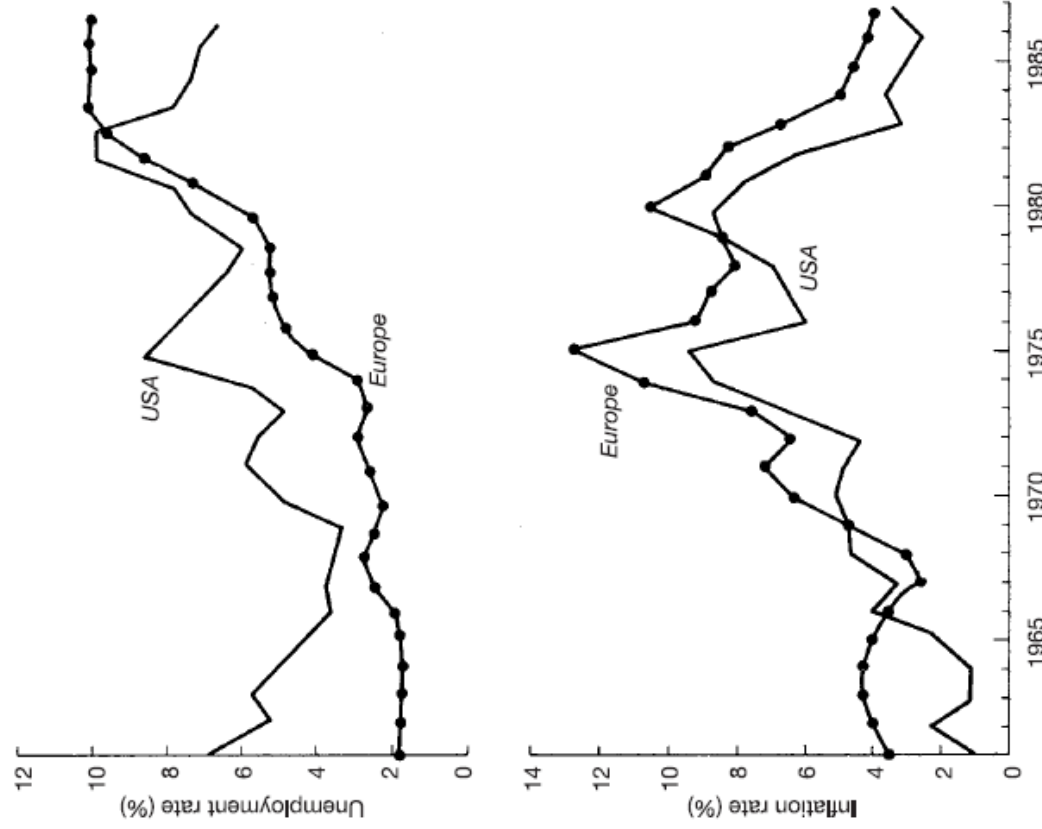


Figure 1.1 The economic crisis of the 1970s: inflation and unemployment in the US and Europe, 1960–1987

Source: Harvey, *The Condition of Postmodernity*.

was widespread and the conjoining of labour and urban social movements throughout much of the advanced capitalist world appeared to point towards the emergence of a socialist alternative to the social compromise between capital and labour that had grounded capital accumulation so successfully in the post-war period. Communist and socialist parties were gaining ground, if not taking power, across much of Europe and even in the United States popular forces were agitating for widespread reforms and state interventions. There was, in this, a clear *political* threat to economic elites and ruling classes everywhere, both in the advanced capitalist countries (such as Italy, France, Spain, and Portugal) and in many developing countries (such as Chile, Mexico, and Argentina). In Sweden, for example, what was known as the Rehn-Meidner plan literally offered to gradually buy out the owners' share in their own businesses and turn the country into a worker/share-owner democracy. But, beyond this, the *economic* threat to the position of ruling elites and classes was now becoming palpable. One condition of the post-war settlement in almost all countries was that the economic power of the upper classes be restrained and that labour be accorded a much larger share of the economic pie. In the US, for example, the share of the national income taken by the top 1 per cent of income earners fell from a pre-war high of 16 per cent to less than 8 per cent by the end of the Second World War, and stayed close to that level for nearly three decades. While growth was strong this restraint seemed not to matter. To have a stable share of an increasing pie is one thing. But when growth collapsed in the 1970s, when real interest rates went negative and paltry dividends and profits were the norm, then upper classes everywhere felt threatened. In the US the control of wealth (as opposed to income) by the top 1 per cent of the population had remained fairly stable throughout the twentieth century. But in the 1970s it plunged precipitously (Figure 1.2) as asset values (stocks, property, savings) collapsed. The upper classes had to move decisively if they were to protect themselves from political and economic annihilation.

The coup in Chile and the military takeover in Argentina, promoted internally by the upper classes with US support, provided one kind of solution. The subsequent Chilean experiment with



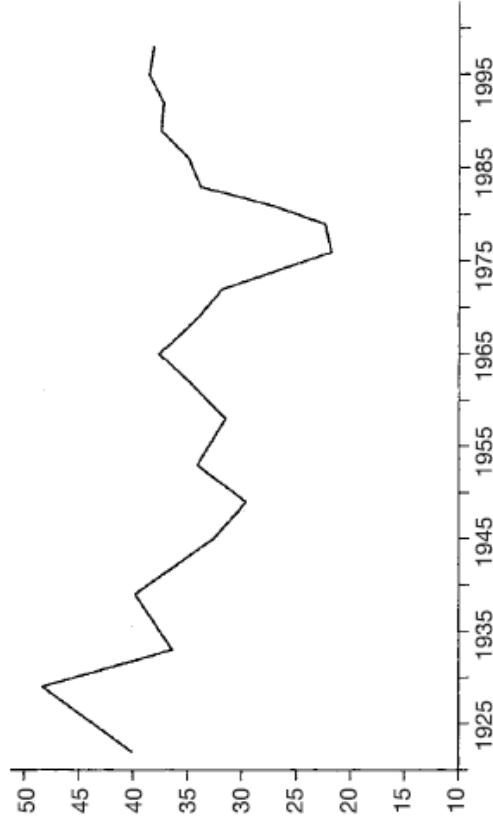


Figure 1.2 The wealth crash of the 1970s: share of assets held by the top 1% of the US population, 1922–1998

Source: Duménil and Lévy, *Capital Resurgent*.

neoliberalism demonstrated that the benefits of revived capital accumulation were highly skewed under forced privatization. The country and its ruling elites, along with foreign investors, did extremely well in the early stages. Redistributive effects and increasing social inequality have in fact been such a persistent feature of neoliberalization as to be regarded as structural to the whole project. Gérard Duménil and Dominique Lévy, after careful reconstruction of the data, have concluded that neoliberalization was from the very beginning a project to achieve the restoration of class power. After the implementation of neoliberal policies in the late 1970s, the share of national income of the top 1 per cent of income earners in the US soared, to reach 15 per cent (very close to its pre-Second World War share) by the end of the century. The top 0.1 per cent of income earners in the US increased their share of the national income from 2 per cent in 1978 to over 6 per cent by 1999, while the ratio of the median compensation of workers to the salaries of CEOs increased from just over 30 to 1 in 1970 to nearly 500 to 1 by 2000 (Figures 1.3 and 1.4). Almost certainly, with the Bush administration's tax reforms now taking effect, the concentration of income and wealth in the upper echelons of society is

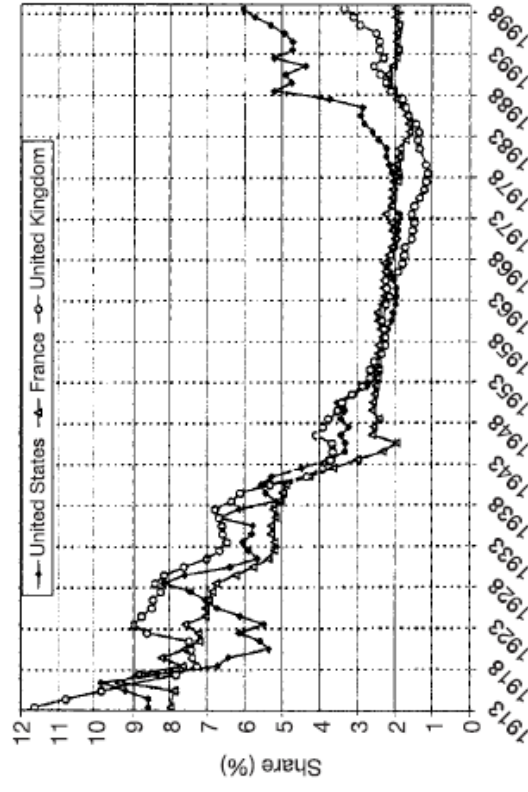
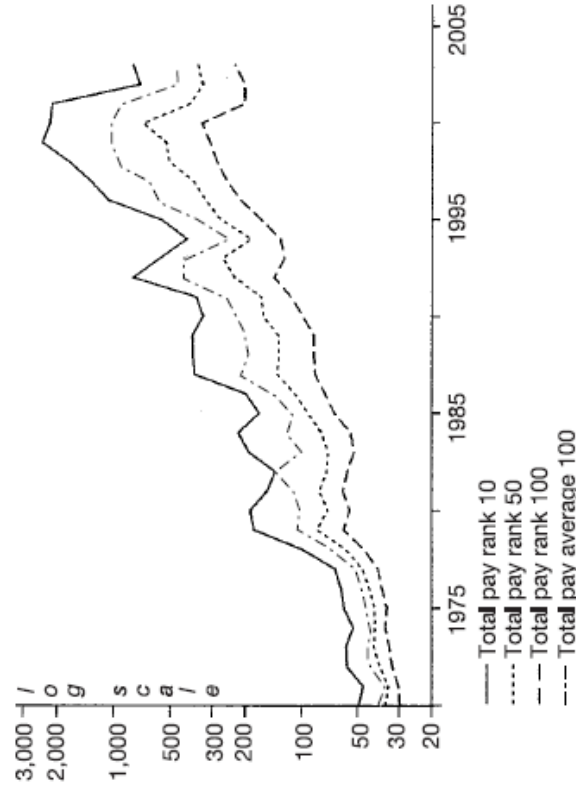


Figure 1.3 The restoration of class power: share in national income of the top 0.1% of the population, US, Britain, and France, 1913–1998

Source: Task Force on Inequality and American Democracy, *American Democracy in an Age of Rising Inequality*.

continuing apace because the estate tax (a tax on wealth) is being phased out and taxation on income from investments and capital gains is being diminished, while taxation on wages and salaries is maintained.<sup>13</sup>

The US is not alone in this: the top 1 per cent of income earners in Britain have doubled their share of the national income from 6.5 per cent to 13 per cent since 1982. And when we look further afield we see extraordinary concentrations of wealth and power emerging all over the place. A small and powerful oligarchy arose in Russia after neoliberal 'shock therapy' had been administered there in the 1990s. Extraordinary surges in income inequalities and wealth have occurred in China as it has adopted free-market-oriented practices. The wave of privatization in Mexico after 1992 catapulted a few individuals (such as Carlos Slim) almost overnight into Fortune's list of the world's wealthiest people. Globally, 'the countries of Eastern Europe and the CIS have registered some of the largest increases ever ... in social inequality. OECD countries also



The first three curves show the rise of the pay of CEOs according to their rank in the hierarchy of remunerations: 10th, 50th, and 100th. The other curve (---) corresponds to the average pay of the 100 CEOs with higher remunerations. Note that 1,000 means 1,000 times the average salary.

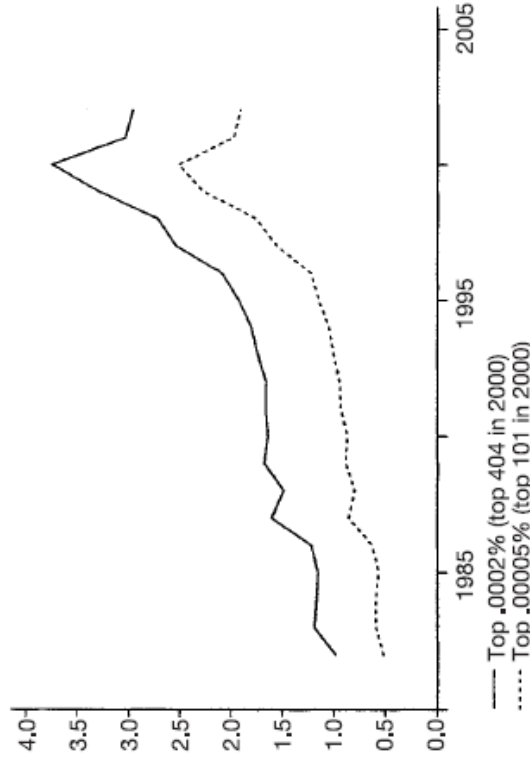


Figure 1.4 The concentration of wealth and earning power in the US: CEO remuneration in relation to average US salaries, 1970–2003, and wealth shares of the richest families, 1982–2002  
Source: Duménil and Lévy, 'Neoliberal Income Trends'.

registered big increases in inequality after the 1980s', while 'the income gap between the fifth of the world's people living in the richest countries and the fifth in the poorest was 74 to 1 in 1997, up from 60 to 1 in 1990 and 30 to 1 in 1960'.<sup>14</sup> While there are exceptions to this trend (several East and South-East Asian countries have so far contained income inequalities within reasonable bounds, as has France—see Figure 1.3), the evidence strongly suggests that the neoliberal turn is in some way and to some degree associated with the restoration or reconstruction of the power of economic elites.

We can, therefore, interpret neoliberalization either as a *utopian* project to realize a theoretical design for the reorganization of international capitalism or as a *political* project to re-establish the conditions for capital accumulation and to restore the power of economic elites. In what follows I shall argue that the second of these objectives has in practice dominated. Neoliberalization has not been very effective in revitalizing global capital accumulation, but it has succeeded remarkably well in restoring, or in some instances (as in Russia and China) creating, the power of an economic elite. The theoretical utopianism of neoliberal argument has, I conclude, primarily worked as a system of justification and legitimization for whatever needed to be done to achieve this goal. The evidence suggests, moreover, that when neoliberal principles clash with the need to restore or sustain elite power, then the principles are either abandoned or become so twisted as to be unrecognizable. This in no way denies the power of ideas to act as a force for historical-geographical change. But it does point to a creative tension between the power of neoliberal ideas and the actual practices of neoliberalization that have transformed how global capitalism has been working over the last three decades.

## The Rise of Neoliberal Theory

Neoliberalism as a potential antidote to threats to the capitalist social order and as a solution to capitalism's ills had long been lurking in the wings of public policy. A small and exclusive group of passionate advocates—mainly academic economists, historians, and philosophers—had gathered together around the renowned



Austrian political philosopher Friedrich von Hayek to create the Mont Pelerin Society (named after the Swiss spa where they first met) in 1947 (the notables included Ludvig von Mises, the economist Milton Friedman, and even, for a time, the noted philosopher Karl Popper). The founding statement of the society read as follows:

The central values of civilization are in danger. Over large stretches of the earth's surface the essential conditions of human dignity and freedom have already disappeared. In others they are under constant menace from the development of current tendencies of policy. The position of the individual and the voluntary group are progressively undermined by extensions of arbitrary power. Even that most precious possession of Western Man, freedom of thought and expression, is threatened by the spread of creeds which, claiming the privilege of tolerance when in the position of a minority, seek only to establish a position of power in which they can suppress and obliterate all views but their own.

The group holds that these developments have been fostered by the growth of a view of history which denies all absolute moral standards and by the growth of theories which question the desirability of the rule of law. It holds further that they have been fostered by a decline of belief in private property and the competitive market; for without the diffused power and initiative associated with these institutions it is difficult to imagine a society in which freedom may be effectively preserved.<sup>15</sup>

The group's members depicted themselves as 'liberals' (in the traditional European sense) because of their fundamental commitment to ideals of personal freedom. The neoliberal label signalled their adherence to those free market principles of neo-classical economics that had emerged in the second half of the nineteenth century (thanks to the work of Alfred Marshall, William Stanley Jevons, and Leon Walras) to displace the classical theories of Adam Smith, David Ricardo, and, of course, Karl Marx. Yet they also held to Adam Smith's view that the hidden hand of the market was the best device for mobilizing even the basest of human instincts such as gluttony, greed, and the desire for wealth and power for the benefit of all. Neoliberal doctrine was therefore deeply opposed to state interventionist theories, such as those of John Maynard Keynes, which rose to prominence in the 1930s in

response to the Great Depression. Many policy-makers after the Second World War looked to Keynesian theory to guide them as they sought to keep the business cycle and recessions under control. The neoliberals were even more fiercely opposed to theories of centralized state planning, such as those advanced by Oscar Lange working close to the Marxist tradition. State decisions, they argued, were bound to be politically biased depending upon the strength of the interest groups involved (such as unions, environmentalists, or trade lobbies). State decisions on matters of investment and capital accumulation were bound to be wrong because the information available to the state could not rival that contained in market signals.

This theoretical framework is not, as several commentators have pointed out, entirely coherent.<sup>16</sup> The scientific rigour of its neoclassical economics does not sit easily with its political commitment to ideals of individual freedom, nor does its supposed distrust of all state power fit with the need for a strong and if necessary coercive state that will defend the rights of private property, individual liberties, and entrepreneurial freedoms. The juridical trick of defining corporations as individuals before the law introduces its own biases, rendering ironic John D. Rockefeller's personal credo etched in stone in the Rockefeller Center in New York City, where he places 'the supreme worth of the individual' above all else. And there are, as we shall see, enough contradictions in the neoliberal position to render evolving neoliberal practices (*vis-à-vis* issues such as monopoly power and market failures) unrecognizable in relation to the seeming purity of neoliberal doctrine. We have to pay careful attention, therefore, to the tension between the theory of neoliberalism and the actual pragmatics of neoliberalization.

Hayek, author of key texts such as *The Constitution of Liberty*, presciently argued that the battle for ideas was key, and that it would probably take at least a generation for that battle to be won, not only against Marxism but against socialism, state planning, and Keynesian interventionism. The Mont Pelerin group garnered financial and political support. In the US in particular, a powerful group of wealthy individuals and corporate leaders who were viscerally opposed to all forms of state intervention and



regulation, and even to internationalism sought to organize opposition to what they saw as an emerging consensus for pursuing a mixed economy. Fearful of how the alliance with the Soviet Union and the command economy constructed within the US during the Second World War might play out politically in a post-war setting, they were ready to embrace anything from McCarthyism to neoliberal think-tanks to protect and enhance their power. Yet this movement remained on the margins of both policy and academic influence until the troubled years of the 1970s. At that point it began to move centre-stage, particularly in the US and Britain, nurtured in various well-financed think-tanks (offshoots of the Mont Pelerin Society, such as the Institute of Economic Affairs in London and the Heritage Foundation in Washington), as well as through its growing influence within the academy, particularly at the University of Chicago, where Milton Friedman dominated. Neoliberal theory gained in academic respectability by the award of the Nobel Prize in economics to Hayek in 1974 and Friedman in 1976. This particular prize, though it assumed the aura of Nobel, had nothing to do with the other prizes and was under the tight control of Sweden's banking elite. Neoliberal theory, particularly in its monetarist guise, began to exert practical influence in a variety of policy fields. During the Carter presidency, for example, deregulation of the economy emerged as one of the answers to the chronic state of stagflation that had prevailed in the US throughout the 1970s. But the dramatic consolidation of neoliberalism as a new economic orthodoxy regulating public policy at the state level in the advanced capitalist world occurred in the United States and Britain in 1979.

In May of that year Margaret Thatcher was elected in Britain with a strong mandate to reform the economy. Under the influence of Keith Joseph, a very active and committed publicist and polemicist with strong connections to the neoliberal Institute of Economic Affairs, she accepted that Keynesianism had to be abandoned and that monetarist 'supply-side' solutions were essential to cure the stagflation that had characterized the British economy during the 1970s. She recognized that this meant nothing short of a revolution in fiscal and social policies, and immediately signalled a fierce determination to have done with the institutions and

political ways of the social democratic state that had been consolidated in Britain after 1945. This entailed confronting trade union power, attacking all forms of social solidarity that hindered competitive flexibility (such as those expressed through municipal government, and including the power of many professionals and their associations), dismantling or rolling back the commitments of the welfare state, the privatization of public enterprises (including social housing), reducing taxes, encouraging entrepreneurial initiative, and creating a favourable business climate to induce a strong inflow of foreign investment (particularly from Japan). There was, she famously declared, 'no such thing as society, only individual men and women'—and, she subsequently added, their families. All forms of social solidarity were to be dissolved in favour of individualism, private property, personal responsibility, and family values. The ideological assault along these lines that flowed from Thatcher's rhetoric was relentless.<sup>17</sup> 'Economics are the method', she said, 'but the object is to change the soul.' And change it she did, though in ways that were by no means comprehensive and complete, let alone free of political costs.

In October 1979 Paul Volcker, chairman of the US Federal Reserve Bank under President Carter, engineered a draconian shift in US monetary policy.<sup>18</sup> The long-standing commitment in the US liberal democratic state to the principles of the New Deal, which meant broadly Keynesian fiscal and monetary policies with full employment as the key objective, was abandoned in favour of a policy designed to quell inflation no matter what the consequences might be for employment. The real rate of interest, which had often been negative during the double-digit inflationary surge of the 1970s, was rendered positive by fiat of the Federal Reserve (Figure 1.5). The nominal rate of interest was raised overnight and, after a few ups and downs, by July 1981 stood close to 20 per cent. Thus began 'a long deep recession that would empty factories and break unions in the US and drive debtor countries to the brink of insolvency, beginning the long era of structural adjustment'.<sup>19</sup> This, Volcker argued, was the only way out of the grumbling crisis of stagflation that had characterized the US and much of the global economy throughout the 1970s.

The Volcker shock, as it has since come to be known, has to be

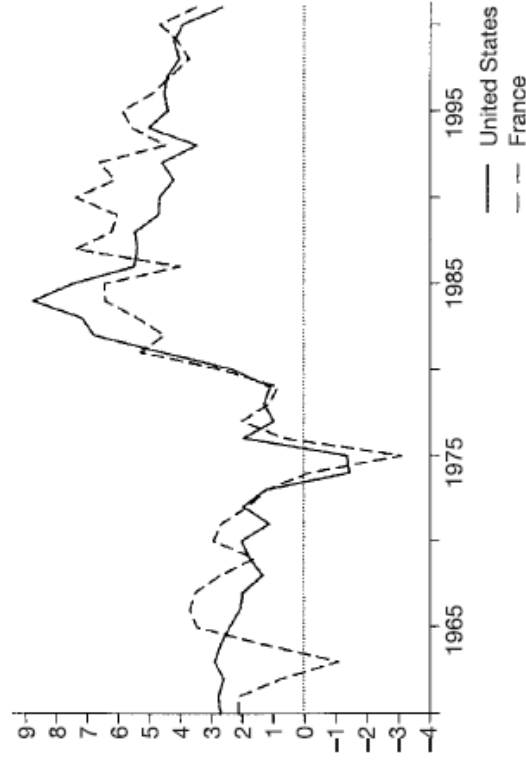


Figure 1.5 The 'Volcker shock': movements in the real rate of interest, US and France, 1960–2001

Source: Duménil and Lévy, *Capital Resurgent*.

interpreted as a necessary but not sufficient condition for neoliberalization. Some central banks had long emphasized anti-inflationary fiscal responsibility and adopted policies that were closer to monetarism than to Keynesian orthodoxy. In the West German case this derived from historical memories of the runaway inflation that had destroyed the Weimar Republic in the 1920s (setting the stage for the rise of fascism) and the equally dangerous inflation that occurred at the end of the Second World War. The IMF had long set itself against excessive debt creation and urged, if not mandated, fiscal restraints and budgetary austerity on client states. But in all these cases this monetarism was paralleled by acceptance of strong union power and a political commitment to build a strong welfare state. The turn to neoliberalism thus depended not only on adopting monetarism but on the unfolding of government policies in many other arenas.

Ronald Reagan's victory over Carter in 1980 proved crucial, even though Carter had shifted uneasily towards deregulation (of airlines and trucking) as a partial solution to the crisis of stagflation. Reagan's advisers were convinced that Volcker's monetarist

'medicine' for a sick and stagnant economy was right on target. Volcker was supported in and reappointed to his position as chair of the Federal Reserve. The Reagan administration then provided the requisite political backing through further deregulation, tax cuts, budget cuts, and attacks on trade union and professional power. Reagan faced down PATCO, the air traffic controllers' union, in a lengthy and bitter strike in 1981. This signalled an all-out assault on the powers of organized labour at the very moment when the Volcker-inspired recession was generating high levels of unemployment (10 per cent or more). But PATCO was more than an ordinary union: it was a white-collar union which had the character of a skilled professional association. It was, therefore, an icon of middle-class rather than working-class unionism. The effect on the condition of labour across the board was dramatic—perhaps best captured by the fact that the Federal minimum wage, which stood on a par with the poverty level in 1980, had fallen to 30 per cent below that level by 1990. The long decline in real wage levels then began in earnest.

Reagan's appointments to positions of power on issues such as environmental regulation, occupational safety, and health, took the

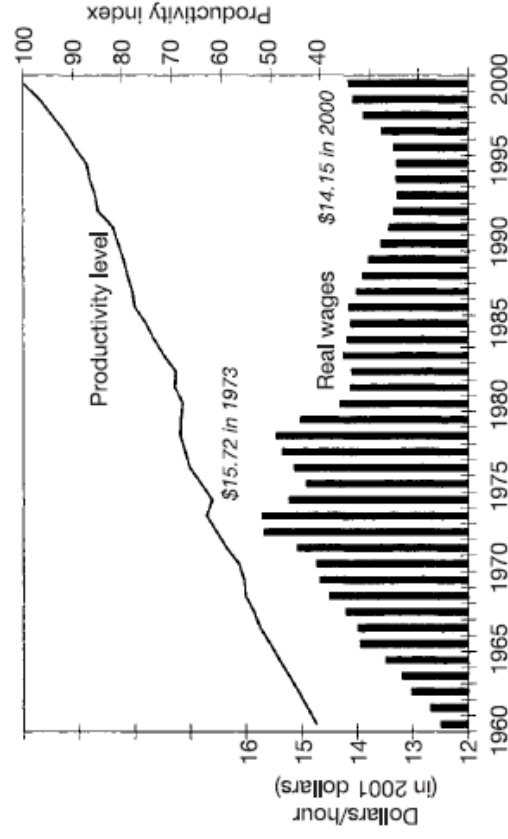


Figure 1.6 The attack on labour: real wages and productivity in the US, 1960–2000

Source: Pollin, *Contours of Descent*.



campaign against big government to ever higher levels. The deregulation of everything from airlines and telecommunications to finance opened up new zones of untrammelled market freedoms for powerful corporate interests. Tax breaks on investment effectively subsidized the movement of capital away from the unionized north-east and midwest and into the non-union and weakly regulated south and west. Finance capital increasingly looked abroad for higher rates of return. Deindustrialization at home and moves to take production abroad became much more common. The market, depicted ideologically as the way to foster competition and innovation, became a vehicle for the consolidation of monopoly power. Corporate taxes were reduced dramatically, and the top personal tax rate was reduced from 70 to 28 per cent in what was billed as 'the largest tax cut in history' (Figure 1.7).

And so began the momentous shift towards greater social inequality and the restoration of economic power to the upper class.

There was, however, one other concomitant shift that also impelled the movement towards neoliberalization during the

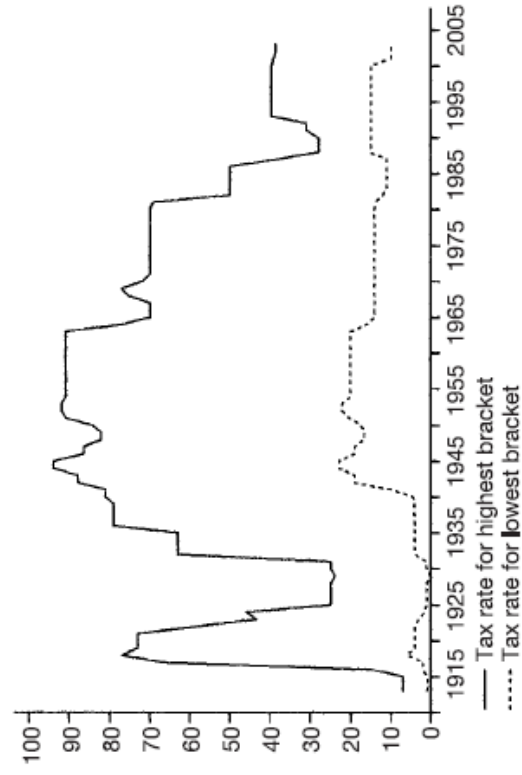


Figure 1.7 The tax revolt of the upper class: US tax rates for higher and lower brackets, 1913–2003

Source: Duménil and Lévy, 'Neoliberal Income Trends'.

1970s. The OPEC oil price hike that came with the oil embargo of 1973 placed vast amounts of financial power at the disposal of the oil-producing states such as Saudi Arabia, Kuwait, and Abu Dhabi. We now know from British intelligence reports that the US was actively preparing to invade these countries in 1973 in order to restore the flow of oil and bring down oil prices. We also know that the Saudis agreed at that time, presumably under military pressure if not open threat from the US, to recycle all of their petrodollars through the New York investment banks.<sup>20</sup> The latter suddenly found themselves in command of massive funds for which they needed to find profitable outlets. The options within the US, given the depressed economic conditions and low rates of return in the mid-1970s, were not good. More profitable opportunities had to be sought out abroad. Governments seemed the safest bet because, as Walter Wriston, head of Citibank, famously put it, governments can't move or disappear. And many governments in the developing world, hitherto starved of funds, were anxious enough to borrow. For this to occur required, however, open entry and reasonably secure conditions for lending. The New York investment banks looked to the US imperial tradition both to prise open new investment opportunities and to protect their foreign operations.

The US imperial tradition had been long in the making, and to great degree defined itself against the imperial traditions of Britain, France, Holland, and other European powers.<sup>21</sup> While the US had toyed with colonial conquest at the end of the nineteenth century, it evolved a more open system of imperialism without colonies during the twentieth century. The paradigm case was worked out in Nicaragua in the 1920s and 1930s, when US marines were deployed to protect US interests but found themselves embroiled in a lengthy and difficult guerrilla insurgency led by Sandino. The answer was to find a local strongman—in this case Somoza—and to provide economic and military assistance to him and his family and immediate allies so that they could repress or buy off opposition and accumulate considerable wealth and power for themselves. In return they would always keep their country open to the operations of US capital and support, and if necessary promote US interests, both in the country and in the region (in the Nicaraguan case, Central America) as a whole. This was the model

that was deployed after the Second World War during the phase of global decolonization imposed upon the European powers at US insistence. For example, the CIA engineered the coup that overthrew the democratically elected Mosaddeq government in Iran in 1953 and installed the Shah of Iran, who gave the oil contracts to US companies (and did not return the assets to the British companies that Mossadeq had nationalized). The shah also became one of the key guardians of US interests in the Middle Eastern oil region.

In the post-war period, much of the non-communist world was opened up to US domination by tactics of this sort. This became the method of choice to fight off the threat of communist insurgencies and revolution, entailing an anti-democratic (and even more emphatically anti-populist and anti-socialist/communist) strategy on the part of the US that put the US more and more in alliance with repressive military dictatorships and authoritarian regimes (most spectacularly, of course, throughout Latin America). The stories told in John Perkins's *Confessions of an Economic Hit Man* are full of the ugly and unsavoury details of how this was all too often done. US interests consequently became more rather than less vulnerable in the struggle against international communism. While the consent of local ruling elites could be purchased easily enough, the need to coerce oppositional or social democratic movements (such as Allende's in Chile) associated the US with a long history of largely covert violence against popular movements throughout much of the developing world.

It was in this context that the surplus funds being recycled through the New York investment banks were dispersed throughout the world. Before 1973, most US foreign investment was of the direct sort, mainly concerned with the exploitation of raw material resources (oil, minerals, raw materials, agricultural products) or the cultivation of specific markets (telecommunications, automobiles, etc.) in Europe and Latin America. The New York investment banks had always been active internationally, but after 1973 they became even more so, though now far more focused on lending capital to foreign governments.<sup>22</sup> This required the liberalization of international credit and financial markets, and the US government began actively to promote and support this strategy

globally during the 1970s. Hungry for credit, developing countries were encouraged to borrow heavily, though at rates that were advantageous to the New York bankers.<sup>23</sup> Since the loans were designated in US dollars, however, any modest, let alone precipitous, rise in US interest rates could easily push vulnerable countries into default. The New York investment banks would then be exposed to serious losses.

The first major test case of this came in the wake of the Volcker shock that drove Mexico into default in 1982–4. The Reagan administration, which had seriously thought of withdrawing support for the IMF in its first year in office, found a way to put together the powers of the US Treasury and the IMF to resolve the difficulty by rolling over the debt, but did so in return for neoliberal reforms. This treatment became standard after what Stiglitz refers to as a 'purge' of all Keynesian influences from the IMF in 1982. The IMF and the World Bank thereafter became centres for the propagation and enforcement of 'free market fundamentalism' and neoliberal orthodoxy. In return for debt rescheduling, indebted countries were required to implement institutional reforms, such as cuts in welfare expenditures, more flexible labour market laws, and privatization. Thus was 'structural adjustment' invented. Mexico was one of the first states drawn into what was going to become a growing column of neoliberal state apparatuses worldwide.<sup>24</sup>

What the Mexico case demonstrated, however, was a key difference between liberal and neoliberal practice: under the former, lenders take the losses that arise from bad investment decisions, while under the latter the borrowers are forced by state and international powers to take on board the cost of debt repayment no matter what the consequences for the livelihood and well-being of the local population. If this required the surrender of assets to foreign companies at fire-sale prices, then so be it. This, it turns out, is not consistent with neoliberal theory. One effect, as Duménil and Lévy show, was to permit US owners of capital to extract high rates of return from the rest of the world during the 1980s and 1990s (Figures 1.8 and 1.9).<sup>25</sup> The restoration of power to an economic elite or upper class in the US and elsewhere in the advanced capitalist countries drew heavily on surpluses extracted



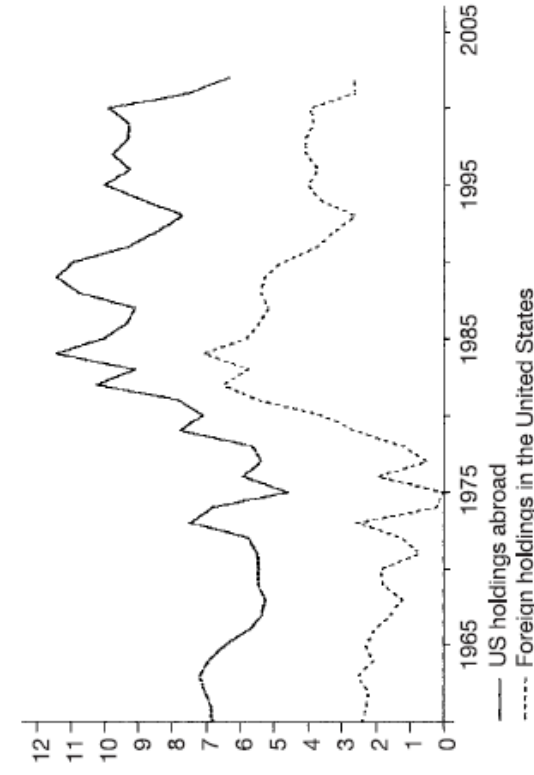


Figure 1.8 Extracting surpluses from abroad: rates of return on foreign and domestic investments in the US, 1960–2002  
Source: Duménil and Lévy, 'The Economics of US Imperialism'.

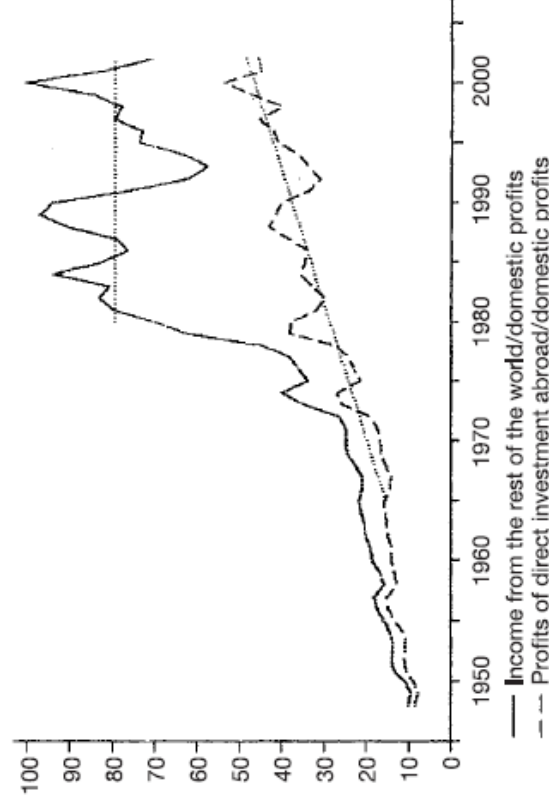


Figure 1.9 The flow of tribute into the US: profits and capital income from the rest of the world in relation to domestic profits  
Source: Duménil and Lévy, 'Neoliberal Dynamics: Towards A New Phase?'.

from the rest of the world through international flows and structural adjustment practices.

### The Meaning of Class Power

But what exactly is meant here by 'class'? This is always a somewhat shadowy (some would even say dubious) concept. Neoliberalization has, in any case, entailed its redefinition. This poses a problem. If neoliberalization has been a vehicle for the restoration of class power, then we should be able to identify the class forces behind it and those that have benefited from it. But this is difficult to do when 'class' is not a stable social configuration. In some cases 'traditional' strata have managed to hang on to a consistent power base (often organized through family and kinship). But in other instances neoliberalization has been accompanied by a reconfiguration of what constitutes an upper class. Margaret Thatcher, for example, attacked some of the entrenched forms of class power in Britain. She went against the aristocratic tradition that dominated in the military, the judiciary, and the financial elite in the City of London and many segments of industry, and sided with the brash entrepreneurs and the nouveaux riches. She supported, and was usually supported by, this new class of entrepreneurs (such as Richard Branson, Lord Hanson, and George Soros). The traditional wing of her own Conservative Party was appalled. In the US, the rising power and significance of the financiers and the CEOs of large corporations, as well as the immense burst of activity in wholly new sectors (such as computing and the internet, media, and retailing) changed the locus of upper-class economic power significantly. While neoliberalization may have been about the restoration of class power, it has not necessarily meant the restoration of economic power to the same people.

But, as the contrasting cases of the US and Britain illustrate, 'class' means different things in different places, and in some instances (for example in the US) it is often held to have no meaning at all. In addition there have been strong currents of differentiation in terms of class identity formation and re-formation in different parts of the world. In Indonesia, Malaysia, and the Philippines, for example, economic power became strongly



concentrated among a few ethnic-minority Chinese, and the mode of acquisition of that economic power was quite different from that in Australia or the US (it was heavily concentrated in trading activities and entailed the cornering of markets<sup>26</sup>). And the rise of the seven oligarchs in Russia derived from the quite unique configuration of circumstances that held in the wake of the collapse of the Soviet Union.

Nevertheless, there are some general trends that can be identified. The first is for the privileges of ownership and management of capitalist enterprises—traditionally separated—to fuse by paying CEOs (managers) in stock options (ownership titles). Stock values rather than production then become the guiding light of economic activity and, as later became apparent with the collapse of companies such as Enron, the speculative temptations that resulted from this could become overwhelming. The second trend has been to dramatically reduce the historical gap between money capital earning dividends and interest, on the one hand, and production, manufacturing, or merchant capital looking to gain profits on the other. This separation had at various times in the past produced conflicts between financiers, producers, and merchants. In Britain, for example, government policy in the 1960s catered primarily to the requirements of the financiers in the City of London, often to the detriment of domestic manufacturing, and in the 1960s conflicts in the US between financiers and manufacturing corporations had often surfaced. During the 1970s much of this conflict either disappeared or took new forms. The large corporations became more and more financial in their orientation, even when, as in the automobile sector, they were engaging in production. Since 1980 or so it has not been uncommon for corporations to report losses in production offset by gains from financial operations (everything from credit and insurance operations to speculating in volatile currency and futures markets). Mergers across sectors conjoined production, merchanting, real estate, and financial interests in new ways to produce diversified conglomerates. When US Steel changed its name to USX (purchasing strong stakes in insurance) the chairman of the board, James Roderick, replied to the question ‘What is X?’ with the simple answer ‘X stands for money.’<sup>27</sup>

All of this connected to the strong burst in activity and power within the world of finance. Increasingly freed from the regulatory constraints and barriers that had hitherto confined its field of action, financial activity could flourish as never before, eventually everywhere. A wave of innovations occurred in financial services to produce not only far more sophisticated global interconnections but also new kinds of financial markets based on securitization, derivatives, and all manner of futures trading. Neoliberalization has meant, in short, the financialization of everything. This deepened the hold of finance over all other areas of the economy, as well as over the state apparatus and, as Randy Martin points out, daily life.<sup>28</sup> It also introduced an accelerating volatility into global exchange relations. There was unquestionably a power shift away from production to the world of finance. Gains in manufacturing capacity no longer necessarily meant rising per capita incomes, but concentration on financial services certainly did. For this reason, the support of financial institutions and the integrity of the financial system became the central concern of the collectivity of neoliberal states (such as the group comprising the world's richest countries known as the G7). In the event of a conflict between Main Street and Wall Street, the latter was to be favoured. The real possibility then arises that while Wall Street does well the rest of the US (as well as the rest of the world) does badly. And for several years, particularly during the 1990s, this is exactly what happened. While the slogan was often advanced in the 1960s that what was good for General Motors was good for the US, this had changed by the 1990s into the slogan that what is good for Wall Street is all that matters.

One substantial core of rising class power under neoliberalism lies, therefore, with the CEOs, the key operators on corporate boards, and the leaders in the financial, legal, and technical apparatuses that surround this inner sanctum of capitalist activity.<sup>29</sup> The power of the actual owners of capital, the stockholders, has, however, been somewhat diminished unless they can gain a sufficiently large voting interest to affect corporate policy. Shareholders have on occasion been bilked of millions by the operations of the CEOs and their financial advisers. Speculative gains have also made it possible to amass enormous fortunes within a



very short period of time (examples are Warren Buffett and George Soros).

But it would be wrong to confine the notion of the upper class to this group alone. The opening up of entrepreneurial opportunities, as well as new structures in trading relations, have allowed substantially new processes of class formation to emerge. Fast fortunes were made in new sectors of the economy such as biotechnology and information technologies (for example by Bill Gates and Paul Allen). New market relations opened up all manner of possibilities to buy cheap and sell dear, if not to actually corner markets in such a way as to build fortunes that can either extend horizontally (as in the case of Rupert Murdoch's sprawling global media empire) or be diversified into all manner of businesses, extending backwards into resource extraction and production and forwards from a trading base into financial services, real-estate development, and retailing. In this it frequently happened that a privileged relationship to state power also played a key role. The two businessmen who were closest to Suharto in Indonesia, for example, both fed the Suharto family financial interests but also fed off their connections to that state apparatus to become immensely rich. By 1997 one of them, the Salim Group, was 'reportedly the world's largest Chinese-owned conglomerate, with \$20 billion in assets and some five hundred companies'. Starting with a relatively small investment company, Carlos Slim gained control over the newly privatized telecommunications system in Mexico and quickly parlayed that into a huge conglomerate empire that controls not only a huge slice of the Mexican economy but has sprawling interests in US retailing (Circuit City and Barnes and Noble) as well as throughout Latin America.<sup>30</sup> In the US, the Walton family has become immensely rich as Wal-Mart has surged into a dominant position in US retailing but with integration into Chinese production lines as well as retail stores worldwide. While there are obvious links between these sorts of activities and the world of finance, the incredible ability not only to amass large personal fortunes but to exercise a controlling power over large segments of the economy confers on these few individuals immense economic power to influence political processes. Small wonder that the net worth of the 358 richest people in 1996 was 'equal to the combined income

of the poorest 45 per cent of the world's population—2.3 billion people'. Worse still, 'the world's 200 richest people more than doubled their net worth in the four years to 1998, to more than \$1 trillion. The assets of the top three billionaires [were by then] more than the combined GNP of all least developed countries and their 600 million people'.<sup>31</sup>

There is, however, one further conundrum to be considered in this process of radical reconfiguration of class relations. The question arises, and has been much debated, as to whether this new class configuration should be considered as transnational or whether it can be still understood as something based exclusively within the parameters of the nation-state.<sup>32</sup> My own position is this. The case that the ruling class anywhere has ever confined its operations and defined its loyalties to any one nation-state has historically been much overstated. It never did make much sense to speak of a distinctively US versus British or French or German or Korean capitalist class. The international links were always important, particularly through colonial and neocolonial activities, but also through transnational connections that go back to the nineteenth century if not before. But there has undoubtedly been a deepening as well as a widening of these transnational connections during the phase of neoliberal globalization, and it is vital that these connectivities be acknowledged. This does not mean, however, that the leading individuals within this class do not attach themselves to specific state apparatuses for both the advantages and the protections that this affords them. *Where* they specifically attach themselves is important, but is no more stable than the capitalist activity they pursue. Rupert Murdoch may begin in Australia then concentrate on Britain before finally taking up citizenship (doubtless on an accelerated schedule) in the US. He is not above or outside particular state powers, but by the same token he wields considerable influence via his media interests in politics in Britain, the US, and Australia. All 247 of the supposedly independent editors of his newspapers worldwide supported the US invasion of Iraq. As a form of shorthand, however, it still makes sense to speak about US or British or Korean capitalist class interests because corporate interests like Murdoch's or those of Carlos Slim or the Salim group both feed



off and nurture specific state apparatuses. Each can and typically does, however, exert class power in more than one state simultaneously.

While this disparate group of individuals embedded in the corporate, financial, trading, and developer worlds do not necessarily conspire as a class, and while there may be frequent tensions between them, they nevertheless possess a certain accordance of interests that generally recognizes the advantages (and now some of the dangers) to be derived from neoliberalization. They also possess, through organizations like the World Economic Forum at Davos, means of exchanging ideas and of consorting and consulting with political leaders. They exercise immense influence over global affairs and possess a freedom of action that no ordinary citizen possesses.

### Freedom's Prospect

This history of neoliberalization and class formation, and the proliferating acceptance of the ideas of the Mont Pelerin Society as the ruling ideas of the time, makes for interesting reading when placed against the background of counter-arguments laid out by Karl Polanyi in 1944 (shortly before the Mont Pelerin Society was established). In a complex society, he pointed out, the meaning of freedom becomes as contradictory and as fraught as its incitements to action are compelling. There are, he noted, two kinds of freedom, one good and the other bad. Among the latter he listed 'the freedom to exploit one's fellows, or the freedom to make inordinate gains without commensurable service to the community, the freedom to keep technological inventions from being used for public benefit, or the freedom to profit from public calamities secretly engineered for private advantage'. But, Polanyi continued, 'the market economy under which these freedoms thrived also produced freedoms we prize highly. Freedom of conscience, freedom of speech, freedom of meeting, freedom of association, freedom to choose one's own job'. While we may 'cherish these freedoms for their own sake',—and, surely, many of us still do—they were to a large extent 'by-products of the same economy that was also responsible for the evil freedoms'.<sup>33</sup> Polanyi's answer to this duality makes strange reading given the current hegemony of neoliberal thinking:

The passing of [the] market economy can become the beginning of an era of unprecedented freedom. Juridical and actual freedom can be made wider and more general than ever before; regulation and control can achieve freedom not only for the few, but for all. Freedom not as an appurtenance of privilege, tainted at the source, but as a prescriptive right extending far beyond the narrow confines of the political sphere into the intimate organization of society itself. Thus will old freedoms and civic rights be added to the fund of new freedoms generated by the leisure and security that industrial society offers to all. Such a society can afford to be both just and free.<sup>34</sup>

Unfortunately, Polanyi noted, the passage to such a future is blocked by the 'moral obstacle' of liberal utopianism (and more than once he cites Hayek as an exemplar of that tradition):

Planning and control are being attacked as a denial of freedom. Free enterprise and private ownership are declared to be essentials of freedom. No society built on other foundations is said to deserve to be called free. The freedom that regulation creates is denounced as unfreedom; the justice, liberty and welfare it offers are decried as a camouflage of slavery.<sup>35</sup>

The idea of freedom 'thus degenerates into a mere advocacy of free enterprise', which means 'the fullness of freedom for those whose income, leisure and security need no enhancing, and a mere pit-tance of liberty for the people, who may in vain attempt to make use of their democratic rights to gain shelter from the power of the owners of property'. But if, as is always the case, 'no society is possible in which power and compulsion are absent, nor a world in which force has no function', then the only way this liberal utopian vision could be sustained is by force, violence, and authoritarianism. Liberal or neoliberal utopianism is doomed, in Polanyi's view, to be frustrated by authoritarianism, or even outright fascism.<sup>36</sup> The good freedoms are lost, the bad ones take over.

Polanyi's diagnosis appears peculiarly appropriate to our contemporary condition. It provides a powerful vantage point from which to understand what President Bush intends when he asserts that 'as the greatest power on earth we [the US] have an obligation to help the spread of freedom'. It helps explain why neoliberalism

has turned so authoritarian, forceful, and anti-democratic at the very moment when 'humanity holds in its hands the opportunity to offer freedom's triumph over all its age-old foes'.<sup>37</sup> It makes us focus on how so many corporations have profited from withholding the benefits of their technologies (such as AIDS drugs) from the public sphere, as well as from the calamities of war (as in the case of Halliburton), famine, and environmental disaster. It raises the worry as to whether or not many of these calamities or near calamities (arms races and the need to confront both real and imagined enemies) have been secretly engineered for corporate advantage. And it makes it all too clear why those of wealth and power so avidly support certain conceptions of rights and freedoms while seeking to persuade us of their universality and goodness. Thirty years of neoliberal freedoms have, after all, not only restored power to a narrowly defined capitalist class. They have also produced immense concentrations of corporate power in energy, the media, pharmaceuticals, transportation, and even retailing (for example Wal-Mart). The freedom of the market that Bush proclaims as the high point of human aspiration turns out to be nothing more than the convenient means to spread corporate monopoly power and Coca Cola everywhere without constraint. With disproportionate influence over the media and the political process this class (with Rupert Murdoch and Fox News in the lead) has both the incentive and the power to persuade us that we are all better off under a neoliberal regime of freedoms. For the elite, living comfortably in their gilded ghettos, the world must indeed seem a better place. As Polanyi might have put it, neoliberalism confers rights and freedoms on those 'whose income, leisure and security need no enhancing', leaving a pittance for the rest of us. How is it, then, that 'the rest of us' have so easily acquiesced in this state of affairs?

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## 2. The Construction of Consent

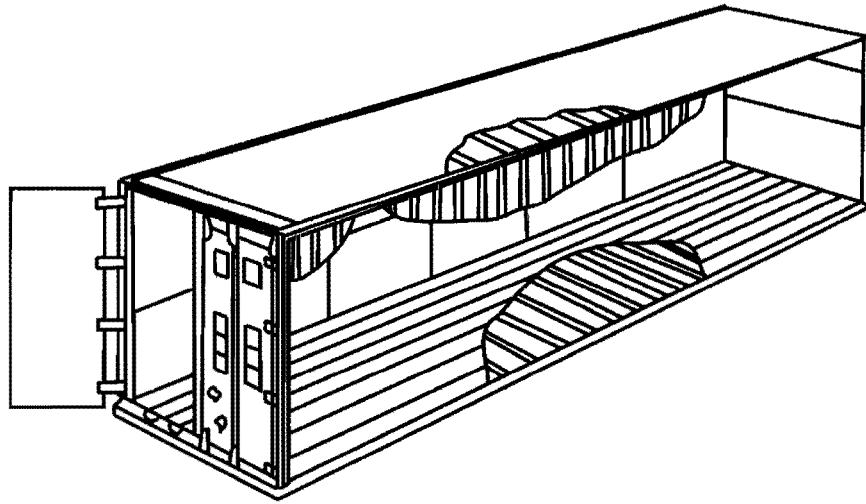
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# The Box

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How the Shipping Container  
Made the World Smaller and the  
World Economy Bigger



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# The World the Box Made

**O**n April 26, 1956, a crane lifted fifty-eight aluminum truck bodies aboard an aging tanker ship moored in Newark, New Jersey. Five days later, the *Ideal-X* sailed into Houston, where fifty-eight trucks waited to take on the metal boxes and haul them to their destinations. Such was the beginning of a revolution.

Decades later, when enormous trailer trucks rule the highways and trains hauling nothing but stacks of boxes rumble through the night, it is hard to fathom just how much the container has changed the world. In 1956, China was not the world's workshop. It was not routine for shoppers to find Brazilian shoes and Mexican vacuum cleaners in stores in the middle of Kansas. Japanese families did not eat beef from cattle raised in Wyoming, and French clothing designers did not have their exclusive apparel cut and sewn in Turkey or Vietnam. Before the container, transporting goods was expensive—so expensive that it did not pay to ship many things halfway across the country, much less halfway around the world.

What is it about the container that is so important? Surely not the thing itself. A soulless aluminum or steel box held together with welds and rivets, with a wooden floor and two enormous doors at one end: the standard container has all the romance of a tin can. The value of this utilitarian object lies not in what it is, but in how

it is used. The container is at the core of a highly automated system for moving goods from anywhere, to anywhere, with a minimum of cost and complication on the way.

The container made shipping cheap, and by doing so changed the shape of the world economy. The armies of ill-paid, ill-treated workers who once made their livings loading and unloading ships in every port are no more, their tight-knit waterfront communities now just memories. Cities that had been centers of maritime commerce for centuries, such as New York and Liverpool, saw their waterfronts decline with startling speed, unsuited to the container trade or simply unneeded, and the manufacturers that endured high costs and antiquated urban plants in order to be near their suppliers and their customers have long since moved away. Venerable ship lines with century-old pedigrees were crushed by the enormous cost of adapting to container shipping. Merchant mariners, who had shipped out to see the world, had their traditional days-long shore leave in exotic harbors replaced by a few hours ashore at a remote parking lot for containers, their vessel ready to weigh anchor the instant the high-speed cranes finished putting huge metal boxes off and on the ship.

Even as it helped destroy the old economy, the container helped build a new one. Sleepy harbors such as Busan and Seattle moved into the front ranks of the world's ports, and massive new ports were built in places like Felixstowe, in England, and Tanjung Pelepas, in Malaysia, where none had been before. Small towns, distant from the great population centers, could take advantage of their cheap land and low wages to entice factories freed from the need to be near a port to enjoy cheap transportation. Sprawling industrial complexes where armies of thousands manufactured products from start to finish gave way to smaller, more specialized plants that shipped components and half-finished goods to one another in ever lengthening supply chains. Poor countries, desperate to climb the rungs of the ladder of economic development, could realistically dream of becoming suppliers to wealthy countries far away. Huge industrial complexes mushroomed in places like Los Angeles and Hong Kong, only because the cost of bringing raw materials in and sending finished goods out had dropped like a stone.<sup>1</sup>

This new economic geography allowed firms whose ambitions had been purely domestic to become international companies, exporting their products almost as effortlessly as selling them nearby. If they did, though, they soon discovered that cheaper shipping benefited manufacturers in Thailand or Italy just as much. Those who had no wish to go international, who sought only to serve their local clientele, learned that they had no choice: like it or not, they were competing globally because the global market was coming to them. Shipping costs no longer offered shelter to high-cost producers whose great advantage was physical proximity to their customers; even with customs duties and time delays, factories in Malaysia could deliver blouses to Macy's in Herald Square more cheaply than could blouse manufacturers in the nearby lofts of New York's garment district. Multinational manufacturers—companies with plants in different countries—transformed themselves into international manufacturers, integrating once isolated factories into networks so that they could choose the cheapest location in which to make a particular item, yet still shift production from one place to another as costs or exchange rates might dictate. In 1956, the world was full of small manufacturers selling locally; by the end of the twentieth century, purely local markets for goods of any sort were few and far between.

For workers, of course, this has all been a mixed blessing. As consumers, they enjoy infinitely more choices thanks to the global trade the container has stimulated. By one careful study, the United States imported four times as many varieties of goods in 2002 as in 1972, generating a consumer benefit—not counted in official statistics—equal to nearly 3 percent of the entire economy. The competition that came with increased trade has diffused new products with remarkable speed and has held down prices so that average households can partake. The ready availability of inexpensive imported consumer goods has boosted living standards around the world.<sup>2</sup>

As wage earners, on the other hand, workers have every reason to be ambivalent. In the decades after World War II, wartime devastation created vast demand while low levels of international trade kept competitive forces under control. In this exceptional environment,

workers and trade unions in North America, Western Europe, and Japan were able to negotiate nearly continuous improvements in wages and benefits, while government programs provided ever stronger safety nets. The workweek grew shorter, disability pay was made more generous, and retirement at sixty or sixty-two became the norm. The container helped bring an end to that unprecedented advance. Low shipping costs helped make capital even more mobile, increasing the bargaining power of employers against their far less mobile workers. In this highly integrated world economy, the pay of workers in Shenzhen sets limits on wages in South Carolina, and when the French government ordered a shorter workweek with no cut in pay, it discovered that nearly frictionless, nearly costless shipping made it easy for manufacturers to avoid the higher cost by moving abroad.<sup>3</sup>

A modern containerport is a factory whose scale strains the limits of imagination. At each berth—the world's biggest ports have dozens—rides a mammoth oceangoing vessel, up to 1,100 feet long and 140 feet across, carrying nothing but metal containers. The deck is crowded with row after row of them, red and blue and green and silver, stacked 15 or 20 abreast and 6 or 7 high. Beneath the deck are yet more containers, stacked 6 or 8 deep in the holds. The structure that houses the crew quarters, topped by the navigation bridge, is toward the stern, barely visible above the stacks of boxes. The crew accommodations are small, but so is the crew. A ship carrying 3,000 40-foot containers, filled with 100,000 tons of shoes and clothes and electronics, may make the three-week transit from Hong Kong around the Cape of Good Hope to Germany with only twenty people on board.<sup>4</sup>

On the wharf, a row of enormous cranes goes into action almost as soon as the ship ties up. The cranes are huge steel structures, rising 200 feet into the air and weighing more than two million pounds. Their legs stretch 50 feet apart, easily wide enough for several truck lanes or even train tracks to pass beneath. The cranes rest on rails running parallel to the ship's side, so that they can move forward or aft as required. Each crane extends a boom 115 feet above



the dock and long enough to span the width of a ship broader than the Panama Canal.

High up in each crane, an operator controls a trolley able to travel the length of the boom, and from each trolley hangs a spreader, a steel frame designed to lock onto all four top corners of a 40-ton box. As unloading begins, each operator moves his trolley out the boom to a precise location above the ship, lowers the spreader to engage a container, raises the container up toward the trolley, and pulls trolley and container quickly toward the wharf. The trolley stops above a rubber-tired transporter waiting between the crane's legs, the container is lowered onto the transporter, and the spreader releases its grip. The transporter then moves the container to the adjacent storage yard, while the trolley moves back out over the ship to pick up another box. The process is repeated every two minutes, or even every ninety seconds, each crane moving 30 or 40 boxes an hour from ship to dock. As parts of the ship are cleared of incoming containers, reloading begins, and dockside activity becomes even more frenzied. Each time the crane places an incoming container on one vehicle, it picks up an outbound container from another, simultaneously emptying and filling the ship.

In the yard, a mile-long strip paved with asphalt, the incoming container is driven beneath a stacking crane. The stacker has rubber-tired wheels 50 feet apart, wide enough to span a truck lane and four adjacent stacks of containers. The wheels are linked by a metal structure 70 feet in the air, so that the entire machine can move back and forth above the rows of containers stacked six high. The crane engages the container, lifts it from the transporter, and moves it across the stacks of other containers to its storage location. A few hours later, the process will be reversed, as the stacking crane lifts the container onto a steel chassis pulled by an over-the-road truck. The truck may take the cargo hundreds of miles to its destination or may haul it to a nearby rail yard, where low-slung cars specially designed for containers await loading.

The colorful chaos of the old-time pier is nowhere in evidence at a major container terminal, the brawny longshoremen carrying bags of coffee on their shoulders nowhere to be seen. Terry Malloy, the

muscular hero played by Marlon Brando in *On the Waterfront*, would not be at home. Almost every one of the intricate movements required to service a vessel is choreographed by a computer long before the ship arrives. Computers, and the vessel planners who use them, determine the order in which the containers are to be discharged, to speed the process without destabilizing the ship. The actions of the container cranes and the equipment in the yard all are programmed in advance. The longshoreman who drives each machine faces a screen telling him which container is to be handled next and where it is to be moved—unless the terminal dispenses with longshoremen by using driverless transporters to pick up the containers at shipside and centrally controlled stacker cranes to handle container storage. The computers have determined that the truck picking up incoming container ABLQ 998435 should be summoned to the terminal at 10:45 a.m., and that outgoing container JKFC 119395, a 40-foot box bound for Newark, carrying 76,800 pounds of machinery and currently stacked at yard location A-52-G-6, will be loaded third from the bottom in the fourth slot in the second row of the forward hold. They have ensured that the refrigerated containers are placed in bays with electrical hookups, and that containers with hazardous contents are apart from containers that could increase the risk of explosion. The entire operation runs like clockwork, with no tolerance for error or human foibles. Within twenty-four hours, the ship discharges its thousands of containers, takes on thousands more, and steams on its way.

Every day at every major port, thousands of containers arrive and depart by truck and train. Loaded trucks stream through the gates, where scanners read the unique number on each container and computers compare it against ships' manifests before the trucker is told where to drop his load. Tractor units arrive to hook up chassis and haul away containers that have just come off the ship. Trains carrying nothing but double-stacked containers roll into an intermodal terminal close to the dock, where giant cranes straddle the entire train, working their way along as they remove one container after another. Outbound container trains, destined for a rail yard two thousand miles away with only the briefest of

stops en route, are assembled on the same tracks and loaded by the same cranes.

The result of all this hectic activity is a nearly seamless system for shipping freight around the world. A 35-ton container of coffeemakers can leave a factory in Malaysia, be loaded aboard a ship, and cover the 9,000 miles to Los Angeles in 16 days. A day later, the container is on a unit train to Chicago, where it is transferred immediately to a truck headed for Cincinnati. The 11,000-mile trip from the factory gate to the Ohio warehouse can take as little as 22 days, a rate of 500 miles per day, at a cost lower than that of a single first-class air ticket. More than likely, no one has touched the contents, or even opened the container, along the way.

This high-efficiency transportation machine is a blessing for exporters and importers, but it has become a curse for customs inspectors and security officials. Each container is accompanied by a manifest listing its contents, but neither ship lines nor ports can vouch that what is on the manifest corresponds to what is inside. Nor is there any easy way to check: opening the doors at the end of the box normally reveals only a wall of paperboard cartons. With a single ship able to disgorge 3,000 40-foot-long containers in a matter of hours, and with a port such as Long Beach or Tokyo handling perhaps 10,000 loaded containers on the average workday, and with each container itself holding row after row of boxes stacked floor to ceiling, not even the most careful examiners have a remote prospect of inspecting it all. Containers can be just as efficient for smuggling undeclared merchandise, illegal drugs, undocumented immigrants, and terrorist bombs as for moving legitimate cargo.<sup>5</sup>

Getting from the *Ideal-X* to a system that moves tens of millions of boxes each year was not an easy voyage. Both the container's promoters and its opponents sensed from the very beginning that this was an invention that could change the way the world works. That first container voyage of 1956, an idea turned into reality by the ceaseless drive of an entrepreneur who knew nothing about ships, unleashed more than a decade of battle around the world. Many titans of the transportation industry sought to stifle the container.

Powerful labor leaders pulled out all the stops to block its ascent, triggering strikes in dozens of harbors. Some ports spent heavily to promote it, while others spent huge sums for traditional piers and warehouses in the vain hope that the container would prove a passing fad. Governments reacted with confusion, trying to figure out how to capture its benefits without disturbing the profits, jobs, and social arrangements that were tied to the status quo. Even seemingly simple matters, such as the design of the steel fitting that allows almost any crane in any port to lift almost any container, were settled only after years of contention. In the end, it took a major war, the United States' painful campaign in Vietnam, to prove the merit of this revolutionary approach to moving freight.

How much the container matters to the world economy is impossible to quantify. In the ideal world, we would like to know how much it cost to send one thousand men's shirts from Bangkok to Geneva in 1955, and to track how that cost changed as containerization came into use. Such data do not exist, but it seems clear that the container brought sweeping reductions in the cost of moving freight. From a tiny tanker laden with a few dozen containers that would not fit on any other vessel, container shipping matured into a highly automated, highly standardized industry on a global scale. An enormous containership can be loaded with a minute fraction of the labor and time required to handle a small conventional ship half a century ago. A few crew members can manage an oceangoing vessel longer than three football fields. A trucker can deposit a trailer at a customer's loading dock, hook up another trailer, and drive on immediately, rather than watching his expensive rig stand idle while the contents are removed. All of those changes are consequences of the container revolution. Transportation has become so efficient that for many purposes, freight costs do not much effect economic decisions. As economists Edward L. Glaeser and Janet E. Kohlhase suggest, "It is better to assume that moving goods is essentially costless than to assume that moving goods is an important component of the production process." Before the container, such a statement was unimaginable.<sup>6</sup>

In 1961, before the container was in international use, ocean freight costs alone accounted for 12 percent of the value of U.S.



TABLE 1  
 Cost of Shipping One Truckload of Medicine from  
 Chicago to Nancy, France (estimate ca. 1960)

	<i>Cash Outlay</i>	<i>Percent of Cost</i>
Freight to U.S. port city	\$341	14.3%
Local freight in port vicinity	\$95	4.0%
Total port cost	\$1,163	48.7%
Ocean shipping	\$581	24.4%
European inland freight	\$206	8.6%
Total	\$2,386	

*Source:* American Association of Port Authority data reported by John L. Eyre. See n.7.

exports and 10 percent of the value of U.S. imports. "These costs are more significant in many cases than governmental trade barriers," the staff of the Joint Economic Committee of Congress advised, noting that the average U.S. import tariff was 7 percent. And ocean freight, dear as it was, represented only a fraction of the total cost of moving goods from one country to another. A pharmaceutical company would have paid approximately \$2,400 to ship a truckload of medicines from the U.S. Midwest to an interior city in Europe in 1960. This might have included payments to a dozen different vendors: a local trucker in Chicago, the railroad that carried the truck trailer on a flatcar to New York or Baltimore, a local trucker in the port city, a port warehouse, a steamship company, a warehouse and a trucking company in Europe, an insurer, a European customs service, and the freight forwarder who put all the pieces of this complicated journey together. Half the total outlay went for port costs.<sup>7</sup>

This process was so expensive that in many cases selling internationally was not worthwhile. "For some commodities, the freight may be as much as 25 per cent of the cost of the product," two engineers concluded after a careful study of data from 1959. Shipping steel pipe from New York to Brazil cost an average of \$57 per

ton in 1962, or 13 percent of the average cost of the pipe being exported—a figure that did not include the cost of getting the pipe from the steel mill to the dock. Shipping refrigerators from London to Capetown cost the equivalent of 68 U.S. cents per cubic foot, adding \$20 to the wholesale price of a midsize unit. No wonder that, relative to the size of the economy, U.S. international trade was smaller in 1960 than it had been in 1950, or even in the Depression year of 1930. The cost of conducting trade had gotten so high that in many cases trading made no sense.<sup>8</sup>

By far the biggest expense in this process was shifting the cargo from land transport to ship at the port of departure and moving it back to truck or train at the other end of the ocean voyage. As one expert explained, “a four thousand mile voyage for a shipment might consume 50 percent of its costs in covering just the two ten-mile movements through two ports.” These were the costs that the container affected first, as the elimination of piece-by-piece freight handling brought lower expenses for longshore labor, insurance, pier rental, and the like. Containers were quickly adopted for land transportation, and the reduction in loading time and transshipment cost lowered rates for goods that moved entirely by land. As ship lines built huge vessels specially designed to handle containers, ocean freight rates plummeted. And as container shipping became intermodal, with a seamless shifting of containers among ships and trucks and trains, goods could move in a never-ending stream from Asian factories directly to the stockrooms of retail stores in North America or Europe, making the overall cost of transporting goods little more than a footnote in a company’s cost analysis.<sup>9</sup>

Transport efficiencies, though, hardly begin to capture the economic impact of containerization. The container not only lowered freight bills, it saved time. Quicker handling and less time in storage translated to faster transit from manufacturer to customer, reducing the cost of financing inventories sitting unproductively on railway sidings or in pierside warehouses awaiting a ship. The container, combined with the computer, made it practical for companies like Toyota and Honda to develop just-in-time manufacturing, in which a supplier makes the goods its customer wants only as the customer

needs them and then ships them, in containers, to arrive at a specified time. Such precision, unimaginable before the container, has led to massive reductions in manufacturers' inventories and correspondingly huge cost savings. Retailers have applied those same lessons, using careful logistics management to squeeze out billions of dollars of costs.

These savings in freight costs, in inventory costs, and in time to market have encouraged ever longer supply chains, allowing buyers in one country to purchase from sellers halfway around the globe with little fear that the gaskets will not arrive when needed or that the dolls will not be on the toy store shelf before Christmas. The more reliable these supply chains become, the further retailers, wholesalers, and manufacturers are willing to reach in search of lower production costs—and the more likely it becomes that workers will feel the sting of dislocation as their employers find distant sources of supply.

Some scholars have argued that reductions in transport costs are at best marginal improvements that have had negligible effects on trade flows. This book disputes that view. In the decade after the container first came into international use, in 1966, the volume of international trade in manufactured goods grew more than twice as fast as the volume of global manufacturing production, and two and a half times as fast as global economic output. Something was accelerating the growth of trade even though the economic expansion that normally stimulates trade was weak. Something was driving a vast increase in international commerce in manufactured goods even though oil shocks were making the world economy sluggish. While attributing the vast changes in the world economy to a single cause would be foolhardy, we should not dismiss out of hand the possibility that the extremely sharp drop in freight costs played a major role in increasing the integration of the global economy.<sup>10</sup>

The subject of this book lies at the confluence of several major streams of research. One delves into the impact of changes in transportation technology, a venerable subject for both historians and economists. The steamship, invented in the 1780s and put to regular

use by 1807, strengthened New York's prominence as a port, and the Erie Canal, an undertaking of unprecedented size, had an even greater impact. The radical decline in ocean freight rates during the nineteenth century, the result of technological change and improved navigation techniques, encouraged a huge increase in world trade and added to Europe's eagerness to found colonies. The connection between railroad development and U.S. economic growth has been debated strenuously, but there is little dispute that lower rail freight rates increased agricultural productivity, knitted the North together before the Civil War, and eventually made Chicago the hub of a region stretching a thousand miles to the west. A transport innovation of the 1880s, the refrigerated railcar, made meat affordable for average households by allowing meat companies to ship carcasses rather than live animals across the country. The truck and the passenger car reshaped urban development starting in the 1920s, and more recently commercial aviation redrew the economic map by bringing formerly isolated communities within a few hours of major cities. This book will argue that container shipping has had a similarly large effect in stimulating trade and economic development—and that, as with steamships, railroads, and airplanes, government intervention both encouraged and deterred its growth.<sup>11</sup>

The importance of innovation is at the center of a second, and rapidly growing, body of research. Capital, labor, and land, the basic factors of production, have lost much of their fascination for those looking to understand why economies grow and prosper. The key question asked today is no longer how much capital and labor an economy can amass, but how innovation helps employ those resources more effectively to produce more goods and services. This line of research makes clear that new technology, by itself, has little economic benefit. As economist Nathan Rosenberg observed, “innovations in their early stages are usually exceedingly ill-adapted to the wide range of more specialised uses to which they are eventually put.” Resistance to new methods can impede their adoption. Potential users may avoid commitments until the future is more certain; as early buyers of Betamax video players can attest, it is risky to bet on a technology that turns out to be a dead end. Even after a new



technology is proven, its spread must often wait until prior investments have been recouped; although Thomas Edison invented the incandescent lightbulb by 1879, only 3 percent of U.S. homes had electric lighting twenty years later. The economic benefits arise not from innovation itself, but from the entrepreneurs who eventually discover ways to put innovations to practical use—and most critically, as economists Erik Brynjolfsson and Lorin M. Hitt have pointed out, from the organizational changes through which businesses reshape themselves to take advantage of the new technology.<sup>12</sup>

This book contends that, just as decades elapsed between the taming of electricity in the 1870s and the widespread use of electrical power, so too did the embrace of containerization take time. Big savings in the cost of handling cargo on the docks did not translate immediately into big savings in the total cost of transportation. Transportation companies were generally ill-equipped to exploit the container's advantages, and their customers had designed their operations around different assumptions about costs. Only with time, as container shipping developed into an entirely new system of moving goods by land and sea, did it begin to affect trade patterns and industrial location. Not until firms learned to take advantage of the opportunities the container created did it change the world. Once the world began to change, it changed very rapidly: the more organizations that adopted the container, the more costs fell, and the cheaper and more ubiquitous container transportation became.<sup>13</sup>

The third intellectual stream feeding into this book is the connection between transportation costs and economic geography, the question of who makes what where. This connection might seem self-evident, but it is not. When David Ricardo showed in 1817 that both Portugal and England could gain by specializing in making products in which they had a comparative advantage, he assumed that only production costs mattered; the costs of shipping Portuguese wine to England and English cloth to Portugal did not enter his analysis. Ricardo's assumption that transportation costs were zero has been incorporated into economists' models ever since, despite ample real-world evidence that transportation costs matter a great deal.<sup>14</sup>

Economists have devoted serious effort to studying the geographic implications of transport costs only since the early 1990s. This new stream of work shows formally what common sense suggests. When transport costs are high, manufacturers' main concern is to locate near their customers, even if this requires undesirably small plants or high operating costs. As transportation costs decline relative to other costs, manufacturers can relocate first domestically, and then internationally, to reduce other costs, which come to loom larger. Globalization, the diffusion of economic activity without regard for national boundaries, is the logical end point of this process. As transport costs fall to extremely low levels, producers move from high-wage to low-wage countries, eventually causing wage levels in all countries to converge. These geographic shifts can occur quickly and suddenly, leaving long-standing industrial infrastructure underutilized or abandoned as economic activity moves on.<sup>15</sup>

Have declines in the cost of shipping really caused such significant economic shifts? Some scholars doubt that ocean freight costs have fallen very much since the middle of the twentieth century. Others, pointing to the undeniable fact that countries trade much more with neighbors than with distant lands, argue that transportation costs still matter a great deal. The present work intentionally takes a non-quantitative approach in addressing these questions. The data on freight costs from the mid-1950s through the 1970s are so severely deficient that they will never provide conclusive proof, but the undisputed fact that the transportation world raced to embrace containerization is very strong evidence that this new shipping technology significantly reduced costs. Nor does this book employ economic models to prove the container's impact. Given the vast changes in the world economy over a span that saw the breakdown of the exchange-rate system, repeated oil crises, the end of colonialism, the invention of jet travel, the spread of computers, the construction of hundreds of thousands of miles of expressways, and many other developments, no model is likely to be conclusive in distinguishing the impact of containerization from that of the many other forces. Nonetheless, dramatic shifts in trade patterns and in the location of economic activity over the past half century suggest

that the connection between containerization and changes in economic geography is extremely strong.<sup>16</sup>

Mysteriously, the container has escaped all three of these very lively fields of research. It has no engine, no wheels, no sails: it does not fascinate those captivated by ships and trains and planes, or by sailors and pilots. It lacks the flash to draw attention from those who study technological innovation. And so many forces have combined to alter economic geography since the middle of the twentieth century that the container is easily overlooked. There is, half a century after its arrival, no general history of the container.<sup>17</sup>

In telling the remarkable story of containerization, this book represents an attempt to fill that historical void. It treats containerization not as shipping news, but as a development that has sweeping consequences for workers and consumers all around the globe. Without it, the world would be a very different place.

### Chapter 1

#### The World the Box Made

1. Steven P. Erie, *Globalizing L.A.: Trade, Infrastructure, and Regional Development* (Stanford, 2004).

2. Christian Broda and David E. Weinstein, “Globalization and the Gains from Variety,” Working Paper 10314, NBER, February 2004.

3. As Jefferson Cowie shows in a definitive case study, the relocation of capital in search of lower production costs is not a new phenomenon; see *Capital Moves: RCA’s Seventy-Year Quest for Cheap Labor* (New York, 1999). The argument of this book is not that containerization initiated the geographic shift of industrial production, but rather that it greatly increased the range of goods that can be manufactured economically at a distance from where they are consumed, the distances across which those products can feasibly be shipped, the punctuality with which that movement occurs, and the ability of manufacturers to combine inputs from widely dispersed sources to make finished products.

4. For a description of life aboard a modern containership, see Richard Pollak, *The Colombo Bay* (New York, 2004).

5. Former U.S. Coast Guard commander Stephen E. Flynn estimated in 2004 that it takes 5 agents 3 hours to completely inspect a loaded 40-foot container, so physically inspecting every box imported through Los Angeles and Long Beach on the average day would require 270,000 man-hours. This equates to approximately 35,000 customs inspectors for those two ports alone. See the thorough discussion of ways to improve the security of container shipping in his *America the Vulnerable: How the U.S. Has Failed to Secure the Homeland and Protect Its People from Terror* (New York, 2004), chap. 5.

6. Several factors make freight-cost data particularly treacherous. Average costs are greatly affected by the mix of cargo; the now defunct ICC



used to report the average cost per ton-mile of rail freight, but year-to-year changes in the average depended mainly upon demand for coal, which traveled at much lower rates per ton than manufactured goods. Second, most historical cost information concerns a single aspect of the process—the ocean voyage between two ports—rather than the total door-to-door cost of a shipment. Third, a proper measure of freight costs over time would have to account for changes in service quality, such as faster ocean transit and reduced cargo theft, and no freight cost index does this. Fourth, a large number of freight shipments occur either within a large company or at prices privately negotiated between the shipper and transportation carriers, so the information required to measure costs economywide often is not publicly available. Edward L. Glaeser and Janet E. Kohlhase, “Cities, Regions, and the Decline of Transport Costs,” Working Paper 9886, NBER, July 2003, p. 4.

7. U.S. Congress, Joint Economic Committee, *Discriminatory Ocean Freight Rates and the Balance of Payments*, November 19, 1963 (Washington, DC, 1964), p. 333; John L. Eyre, “Shipping Containers in the Americas,” in Pan American Union, “Recent Developments in the Use and Handling of Unitized Cargoes” (Washington, DC, 1964), pp. 38–42. Eyre’s data were developed by the American Association of Port Authorities.

8. Estimate of freight rates reaching 25 percent of value is in Douglas C. MacMillan and T. B. Westfall, “Competitive General Cargo Ships,” *Transactions of the Society of Naval Architects and Marine Engineers* 68 (1970): 843. Ocean freight rates for pipe and refrigerators are in Joint Economic Committee, *Discriminatory Ocean Freight Rates*, p. 342. Trade shares are taken from U.S. Bureau of the Census, *Historical Statistics of the United States* (Washington, DC, 1975), p. 887.

9. Eyre, “Shipping Containers in the Americas,” p. 40.

10. Paul Krugman, “Growing World Trade: Causes and Consequences,” *Brookings Papers in Economic Activity* 1995, no. 1 (1995): 341; World Trade Organization, *World Trade Report 2004* (Geneva, 2005), pp. 114–129.

11. Robert Greenhalgh Albion, *The Rise of New York Port* (New York, 1939; reprint, 1971), pp. 145–146; Peter L. Bernstein, *Wedding of the Waters: The Erie Canal and the Making of a Great Nation* (New York, 2005); Douglass North, “Ocean Freight Rates and Economic Development 1750–1913,” *Journal of Economic History* 18 (1958): 537–555. W. W. Rostow, among many others, argues that railroads were essential to the “take off” of U.S. growth in the 1840s and 1850s; see his *Stages of Economic Growth* (Cambridge, UK, 1960), pp. 38–55. Alfred D. Chandler, Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, MA, 1977), also assigns a critical role to railroads, although for very different

reasons. Robert William Fogel, *Railroads and American Economic Growth* (Baltimore, 1964), rejects the Rostow view, asserting that “the railroad did not make an overwhelming contribution to the productive potential of the economy,” p. 235. Albert Fishlow also rejects Rostow’s claim that railroad construction was essential in stimulating American manufacturing, but contends that cheaper freight transportation had important effects on agriculture and led to a reorientation of regional economic relationships; see *American Railroads and the Transformation of the Ante-Bellum Economy* (Cambridge, MA, 1965) as well as “Antebellum Regional Trade Reconsidered,” *American Economic Review* (1965 supplement): 352–364. On the role of railroads in Chicago’s rise, see William Cronon, *Nature’s Metropolis: Chicago and the Great West* (New York, 1991), and Mary Yeager Kujovich, “The Refrigerator Car and the Growth of the American Dressed Beef Industry,” *Business History Review* 44 (1970): 460–482. For an example from Britain, see Wray Vamplew, “Railways and the Transformation of the Scottish Economy,” *Economic History Review* 24 (1971): 54. On transportation and urban development, see James Heilbrun, *Urban Economics and Public Policy* (New York, 1974), p. 32, and Edwin S. Mills and Luan Sendé, “Inner Cities,” *Journal of Economic Literature* 35 (1997): 731. On aviation, see Caroline Isard and Walter Isard, “Economic Implications of Aircraft,” *Quarterly Journal of Economics* 59 (1945): 145–169.

12. The seminal article along this line was Robert Solow, “Technical Change and the Aggregate Production Function,” *Review of Economics and Statistics* 39, no. 2 (1957): 65–94. On the problems of innovation, see Joel Mokyr, “Technological Inertia in Economic History,” *Journal of Economic History* 52 (1992): 325–338; Nathan Rosenberg, “On Technological Expectations,” *Economic Journal* 86, no. 343 (1976): 528; and Erik Brynjolfsson and Lorin M. Hitt, “Beyond Computation: Information Technology, Organizational Transformation, and Business Performance,” *Journal of Economic Perspectives* 14, no. 4 (2000): 24. Electricity was first used in manufacturing in 1883; for discussion of its relatively slow acceptance in manufacturing, see Warren D. Devine, Jr., “From Shafts to Wires: Historical Perspective on Electrification,” *Journal of Economic History* 43 (1983): 347–372. Examples of the debate over computers include Paul A. David, “The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox,” *American Economic Review* 80 (1990): 355–361; Stephen D. Oliner and Daniel E. Sichel, “The Resurgence of Growth in the Late 1990s: Is Information Technology the Story?” *Journal of Economic Perspectives* 14, no. 4 (2000): 3–22; and Dale W. Jorgenson and Kevin J. Stiroh, “Information Technology and Growth,” *American Economic Review* 89, no. 2 (1999): 109–115.

13. Paul M. Romer, “Why, Indeed, in America? Theory, History, and the Origins of Modern Economic Growth,” Working Paper 5443, NBER, January 1996.

14. David Ricardo, *The Principles of Political Economy and Taxation* (London, 1821; reprint, New York, 1965), pp. 77–97. Richard E. Caves and Ronald W. Jones point out that the widely taught Heckscher-Ohlin model, which shows that a country has a comparative advantage in producing goods that make more intensive uses of its more abundant factor of production, assumes that transport costs will not affect trade; see their *World Trade and Payments: An Introduction*, 2nd ed. (New York, 1977). More typically, Miltiades Chacholiades, *Principles of International Economics* (New York, 1981), p. 333, describes international market equilibrium under the unstated assumption that trade is costless.

15. The seminal article in this field was Paul Krugman, “Increasing Returns and Economic Geography,” *Journal of Political Economy* 99, no. 3 (1991): 483–499. The impact of changing transportation costs is further developed in Krugman and Anthony J. Venables, “Globalization and the Inequality of Nations,” *Quarterly Journal of Economics* 110, no. 4 (1995): 857–880, and in Masahisa Fujita, Paul Krugman, and Anthony J. Venables, *The Spatial Economy: Cities, Regions, and International Trade* (Cambridge, MA, 1999).

16. David Hummels, “Have International Transportation Costs Declined?” Working Paper, University of Chicago Graduate School of Business, 1999, and the International Monetary Fund, *World Economic Outlook*, September 2002, p. 116, contend that the cost of sea freight has not fallen significantly in recent decades. James E. Anderson and Eric van Wincoop, “Trade Costs,” *Journal of Economic Literature* 42 (September 2004): 691–751, and Céline Carrere and Maurice Schiff, “On the Geography of Trade: Distance Is Alive and Well,” World Bank Policy Research Working Paper 3206, February 2004, are among those arguing the continued significance of transport costs in determining trade flows. David Coe and three coauthors offer a technical critique of those arguments and conclude that long-distance international trade has in fact increased, implying that lower transport costs may have encouraged globalization; see “The Missing Globalization Puzzle,” International Monetary Fund Working Paper WP/02/171, October 2002.

17. The closest approximation to a general history of the container is Theodore O. Wallin, “The Development, Economics, and Impact of Technological Change in Transportation: The Case of Containerization” (Ph.D. diss., Cornell University, 1974).

# The System

**A** **dock strike loomed** over East Coast ports in the autumn of 1956. Facing the prospect that the Pan-Atlantic and Waterman fleets would sit idle, Malcolm McLean decided to use the time to advantage. Six of Waterman's C-2 freighters were transferred to Pan-Atlantic's control. They were sent to Waterman's shipyard in Mobile, which had been closed after World War II but was reopened to convert them into pure containerships. The idea was to build a honeycomb of metal cells in the holds so that 35-foot containers, two feet longer than those carried on the *Ideal-X*, could be lowered in and stacked five or six high. The ships were to be rebuilt and back at sea by 1957. Of course, there was no model of a pure containership, the metal cells did not exist, and no one had ever stacked containers five or six high. How tightly should the containers fit into the cells? How would a stack of six containers behave when a ship rolled in heavy seas? And how could the vessels be unloaded at ports where there were no land-based cranes? As was his way, McLean did not preoccupy himself with such details. He simply told his staff to get the job done.<sup>1</sup>

The C-2s, unlike Pan-Atlantic's T-2 tankers, had been designed to carry large amounts of mixed cargo in their five holds, and altering them posed no great problem. The decks were widened from 63



feet to 72 feet, and the hatches were expanded so that the entire container storage area would be accessible from above. The cells to hold the containers inside the ship were a tougher challenge. At the Alabama State Docks in Mobile, Keith Tantlinger built a mock-up 20 feet high. The cell guides, vertical strips of steel with a 90-degree angle to hold the corners of a container, were mounted on hydraulic jacks, which could be raised and lowered to simulate a heeling ship. A crane tried to deposit and remove a container from the cell while it was at various angles, and instruments measured the stresses and strains on the container and the cell as it tilted this way and that. After hundreds of tests, Tantlinger concluded that each cell should be  $1\frac{1}{4}$  inches longer than the container it was meant to hold and  $\frac{3}{4}$  of an inch wider; smaller dimensions made it too hard for the crane operator to ease the box into the cell guides, but larger ones allowed the container to shift too much. The cells were built and installed in the holds, giving the C-2s the ability to carry 226 containers, almost four times the load of the *Ideal-X*.<sup>2</sup>

Bigger ships with bigger loads would make loading and unloading vastly more complicated. The methods used for the smaller T-2s were no longer good enough: with 226 containers, a loading rate of one container every seven minutes would require a vessel to spend more than twenty-four hours in port to take on a full load. Every aspect of the operation needed to be redesigned for faster handling. Tantlinger invented a new trailer chassis, with edges sloped so that a container being lowered by a crane would be guided into place automatically. A new locking system allowed a longshoreman to secure or release the container by raising or lowering a handle at each corner of the chassis, doing away with the labor-intensive routine of using iron chains to prevent the box from slipping off the truck. These changes meant that a truck could deliver or take on a container and quickly drive away without occupying precious space at dockside. The containers themselves were redesigned with heavy steel corner posts to support the weight of more containers above them, and a new refrigerated version had the cooling unit set within the profile of the container, so that it could be stacked along with nonrefrigerated boxes. New doors were de-

signed with the hinges recessed within the rear corner posts rather than protruding from the sides.

All of these new containers had a special steel casting built into each of their eight corners. The casting contained an oblong hole designed to accommodate the most critical invention of all, the twist lock. This device, with one conical section pointing down and another up, could be inserted into the corner castings of containers as they were stacked. When one was lowered upon the other, a longshoreman could quickly turn the handle and lock the two boxes tightly together. By pulling the handle the other way, a worker could release the two boxes in seconds when it was time to discharge the ship.<sup>3</sup>

Not until the cells and containers had been designed could Pan-Atlantic focus on the other critical component of its new operation, the cranes. The big dockside cranes in New York and Houston were inadequate to meet the new demands, and the other ports McLean wanted to serve lacked large cranes altogether. Shipboard cranes were the obvious answer, but existing shipboard cranes were not big enough to lift a 35-foot container weighing 40,000 pounds. No established maritime crane manufacturer could design and deliver a test model within the 90 days left in McLean's ambitious schedule. In desperation, Tantlinger, who knew of the logging industry from his years in Washington State, proposed calling companies that manufactured diesel-powered logging cranes. Robert "Booze" Campbell, whose engineering firm helped redesign the ships and terminals, came upon the Skagit Steel & Iron Works in Sedro-Woolley, Washington.

Skagit Steel's owner, Sidney McIntyre, had never worked on ships and was unfamiliar with electric cranes, but he agreed to build one. He was, in Campbell's description, "a mechanical genius." Within ninety days, Skagit Steel produced an enormous crane, which rode on a huge gantry that bridged an entire ship. The C-2s had their wheelhouses amidships, so each vessel required two cranes, one fore and one aft. The cranes moved backward and forward on rails placed along the ship's sides and could travel across the width of the vessel, stopping immediately above any container and hoisting it vertically.

Long, folding arms allowed the cranes to travel out over the dock to pick up and lower containers.<sup>4</sup>

The combination of cells and gantry cranes allowed the containers to be handled with unprecedented speed. Once the first column of cells had been unloaded, the ship could be loaded and unloaded simultaneously, in assembly-line fashion: each time the crane traveled to the dock to deposit an incoming trailer on an empty chassis, it would pick up an outgoing trailer and place it into an empty cell. With two cranes, each loading and unloading fifteen boxes an hour, the *Gateway City*, the first of the converted C-2s, could be emptied and reloaded in just eight hours. The new ships were “[t]he greatest advance made by the United States merchant marine in our time,” said Congressman Herbert Bonner, chairman of the Merchant Marine Committee. Tantlinger was not so certain. Before the *Gateway City*’s first voyage, on October 4, 1957, he dropped by the F. W. Woolworth store in Newark and purchased all of the store’s modeling clay. He cut the clay into small pieces with his pocket knife and wedged several pieces in the narrow spaces between the corners of the top containers and the metal frames of the cells. When the *Gateway City* docked in Miami three days later, he retrieved the clay to see how much the containers had shifted. The indentations on the clay revealed that they had moved by only  $\frac{5}{16}$  of one inch—proof, at last, that a stack of containers in the hold would not sway dangerously as a containership rolled at sea.<sup>5</sup>

Pan-Atlantic had four of its six pure containerships in service by the end of 1957, with a ship sailing south from New York or east from Houston every four and a half days. The last two converted C-2s joined the fleet early in 1958. The *Ideal-X* and its sister tankers were sold off, along with 490 of the original 33-foot containers and 300 matching chassis. Pan-Atlantic’s Sea-Land Service, its capacity five times larger than it had been a year earlier, seemed poised for explosive growth.<sup>6</sup>

Instead, it sailed into trouble. McLean planned to use two of the all-container ships to open service to Puerto Rico in March 1958. Puerto Rico was a potentially lucrative market. As an island, it relied on ships to provide almost all of its consumer goods. As a U.S. com-

monwealth, it was subject to the Jones Act, a law requiring that cargo moving between U.S. ports use American-built ships with American crews. Limited competition allowed the few carriers serving Puerto Rico to charge very high rates, and McLean figured that Pan-Atlantic's containers could easily grab market share. He figured without the longshoremen. When the first containership arrived from Newark, longshoremen in San Juan refused to unload the containers. Four costly months of negotiation ensued, with two ships sitting idle. Pan-Atlantic finally bent to union demands to use large, twenty-four-man gangs to handle containerships, and regular service opened in August. The delay, plus the cost of getting rid of the now obsolete tankers, drove McLean Industries dangerously into the red. A net loss of \$4.2 million for 1958 nearly wiped out the earnings retained during the company's first three years.<sup>7</sup>

McLean was not deterred. Pan-Atlantic's problems, he determined, were rooted in the maritime industry's passive, slow-moving culture. Domestic ship lines, such as Pan-Atlantic, operated in a highly regulated environment that left little room for entrepreneurial spirit. American-owned lines operating internationally, such as Waterman, were allowed to join international rate-making cartels. U.S.-flag ships, using American crews, had the exclusive right to carry the huge flow of U.S. government shipments, including military cargo, and many lines received government operating subsidies as well. This sheltered culture led to excesses like Waterman's headquarters building in Mobile, with its revolving globe in the lobby and the lavish executive suite on the sixteenth floor. It did not breed the sorts of creative, aggressive, hungry employees that suited Malcom McLean. McLean decided it was time for a culture change. In June 1958, Pan-Atlantic, which now ran only containerships, moved to a new headquarters in a converted pineapple warehouse near the Newark docks, while Waterman, the traditional breakbulk ship line, was deliberately left behind in Mobile.

The new Pan-Atlantic office had a very different atmosphere. Malcom McLean had a simply furnished glass-fronted office facing a large, open floor on which desks were lined up side by side. Every morning, McLean wandered the floor to check on the latest cash



flow statement or the status of shipbuilding plans, disregarding hierarchy to get the information he wanted. The company's tone, though, was set by his sister Clara. Her desk was in the middle of the floor, where she could keep an eye on everything and everyone. She knew who had come in late. She decorated the office; managers who were promoted into glass-fronted offices of their own found that she had selected their furnishings for them, right down to the art. "If you put a picture or a calendar on the wall, you got a note from Clara the next morning," one recalled. She set the rules: coffee nowhere but the coffee room, no personal phone calls, desks cleared every night. She personally reviewed every single time card and approved every hire.<sup>8</sup>

Malcom McLean was not the only shipping magnate with an interest in containerization. In 1954, as McLean was leasing terminals for his proposed roll on-roll off service on the East Coast, the Matson Navigation Company began to sponsor academic research on cargo handling. Matson, based in San Francisco, was thinking about containers as well, but its approach was the polar opposite of McLean's.

Matson, established in 1882, had been a loosely managed, family-dominated company that grew from a single ship in Hawaii into a transportation conglomerate. It owned California oil wells, oil tankers, and tanks in the Hawaiian Islands to store the oil. It owned passenger ships and built hotels on Waikiki Beach to attract passengers. It owned Hawaiian sugar plantations and the ships to carry sugar to the mainland. For a few years after World War II, it even owned an airline. None of this made much money, and the company's underlying problem was that many of its big shareholders didn't want it to make much money. The board of directors included representatives of major Hawaiian sugar and pineapple growers whose main interest was a cheap way to get their products to market. Whether the shipping service made a profit was almost incidental.<sup>9</sup>

Things began to change in 1947, when the Matson family convinced veteran steamship executive John E. Cushing to postpone his planned retirement and serve for three years as president. Cushing put the company on a budget for the first time and took a serious

interest in addressing dismally low productivity. In 1948, Matson installed a revolutionary mechanized system to ship sugar to the mainland in bulk rather than in hundred-pound bags. Bulk sugar had required large investments—huge bins at the Hawaii end to hold the raw sugar, a special fleet of trucks to carry the sugar from mills to the pier, conveyors to move the sugar from the trucks to the top of the bin, and more conveyors to recirculate it within the bins, so the sticky substance would not solidify in place. These outlays had brought vastly lower costs. Sugar had given Matson a feel for what automation could achieve. Shortly after Cushing's departure, the company decided to look into mechanizing the handling of the general cargo it carried between the West Coast and Hawaii.<sup>10</sup>

Matson moved deliberately. Pan-Atlantic, under McLean's control, was a scrappy upstart building a brand-new business, and it risked little by acting quickly. Matson had no such haste; it had a large existing business to protect, and its directors were tight with the purse strings. After commissioning outside studies for two years—the same two years it took Malcom McLean to move from a concept to a functioning business—Matson created an in-house research department in 1956. The man recruited to run it was Foster Weldon, a geophysicist most recently involved in developing the Polaris nuclear submarine.

The contrast with Pan-Atlantic could not have been more stark. McLean's engineers, people like Keith Tantlinger and Robert Campbell, were no intellectual slouches, but they had worked in industry, not academia, and they were well advised not to flaunt their pedigrees in public. Weldon was a professor at the prestigious Johns Hopkins University in Baltimore and a well-known figure in the new science of operations research, the study of efficient ways to manage complex systems. Pan-Atlantic's initial technology had been designed on the fly, using obsolete tanker ships, shipbuilding cranes, and containers whose length was determined by the size of the tankers, on the assumption that it could all be improved once the business was up and running. Weldon found this catch-as-catch-can strategy bewildering. "All transportation companies have their own pet theories on the detailed equipment requirements comprising a

'best' container system, but there are no quantitative data relating even such gross characteristics as container size to the economics of a total transportation operation," he wrote pointedly. His goal, as he defined it, was to develop good data and use them to find the *optimal* way for Matson to embark upon container shipping.<sup>11</sup>

Weldon quickly came upon the issues that would shape Matson's approach. About half of the company's general cargo was suitable for shipment in containers, but the flow was out of balance: for every ton the company shipped from Hawaii to the mainland, it shipped three tons from the mainland to Hawaii. Revenues from the west-bound run would need to cover the cost of returning large numbers of empty containers west to east. Even worse, much of Matson's business came from food processors in California sending small loads to mom-and-pop grocery stores in the islands. Matson would need to consolidate these small shipments to fill whole containers in California, and would then have to open the containers in Honolulu and parcel out the loads for various destinations. This would make container shipping expensive. On the other side of the equation, though, Weldon found that by eliminating the need to transfer individual pieces of cargo from trucks to ships and back again, containers would eliminate almost half the cost of Matson's existing business. "[T]his cost has increased steadily in the past and will continue to do so indefinitely as long as the operation remains a manual one," he concluded. "There is certainly no indication of a change in the current trend of spiraling longshore wages with no corresponding increase in labor productivity." Given the urgent need to automate, Weldon conceived of a way to make the container work: if Matson could load those small shipments into containers in route-sequence order, delivery trucks could collect the containers in Honolulu and proceed immediately on their routes. The goods for each store would be handled only when the truck arrived there, making containerization on the Hawaii run economically viable.<sup>12</sup>

Given that containers made sense, how big should they be? Weldon's analysis pointed out that the smaller the size, the greater the number of loads that would fill entire containers going directly from shipper to recipient, with no reloading. On the other hand, two 10-

foot containers would take twice as long to load on a ship as one 20-foot box, making poor use of the company's investment in cranes and ships. After analyzing thousands of Matson shipments by computer—a task that in 1956 required feeding in thousands of punch cards—Weldon's researchers concluded that vans of 20 to 25 feet would be most efficient in the Hawaii trade: larger containers would travel with too much empty space, while containers shorter than 20 feet would require too much loading time. They recommended that Matson start out by carrying containers on deck, as Pan-Atlantic had, with conventional breakbulk cargo in the holds. By converting six of its fifteen C-3 cargo ships to carry containers on deck, Matson would be able to offer weekly container service between Honolulu and both Los Angeles and San Francisco. Weldon found that this arrangement would be profitable even if the container business stayed small. If the business grew, the company could convert additional ships to carry only containers. Containerization, he concluded, "would appear to present the fortunate circumstance of a promising initial course of action offering the option of going as far as desired and stopping at any point that prudent planning dictates."<sup>13</sup>

Matson management accepted Weldon's recommendations in early 1957. Leslie Harlander, a newly minted naval architect, was put in charge of the engineering. Harlander was told to hire a staff and begin detailed planning for every aspect of a container operation. He was given clear guidance to be careful about money. Every choice had to be justified based on whether it offered a higher return on investment than the alternatives.<sup>14</sup>

Harlander and his brother Don, an engineer who specialized in cranes, began to lay out their requirements for cranes in July 1957. In October, they went to Houston to observe the first arrival of Pan-Atlantic's newly rebuilt *Gateway City*. The *Gateway City* was a C-2 ship, slightly smaller and slower than the World War II-vintage C-3s in Matson's fleet, and it was equipped with Sea-Land's two novel shipboard cranes. With both cranes working, the *Gateway City*'s turnaround time was no longer than that of the much smaller *Ideal-X*. As the Harlanders saw firsthand, though, the shipboard cranes had shortcomings. Pan-Atlantic's two crane drivers each sat



high above the deck facing two colored lights. A green light told one driver that he could move the crane trolley over the side of the ship to deposit a container on the dock, while a red light told the other driver to wait. If both cranes accidentally dangled forty-thousand-pound containers over the side at the same time, the unbalanced weight could capsize the vessel. Matson, with plans to serve only a small number of large ports rather than many small ones, had no need to put up with this risk. The first big decision was an easy one: land-based cranes were the way to go.<sup>15</sup>

These would not be leftover cranes adapted from some other use like the cut-down shipyard cranes Pan-Atlantic had pressed into service in 1956. The original Pan-Atlantic cranes were revolvers, known in a shipping trade as “whirleys.” They did well enough at picking up a container from the deck of a ship and swinging it in an arc toward the dock, but their design made it difficult to lower the container precisely atop a trailer chassis, which slowed down the entire operation. Matson’s cranes were designed from scratch, with a requirement that they be able to unload an incoming container and load an outgoing box within five minutes—a cycle two minutes shorter than that of Pan-Atlantic’s first cranes. The Matson cranes were to have booms that stretched ninety-five feet from the dock, more than enough to span the entire width of the ships in Matson’s fleet. The operator would control a trolley to move the lifting beam out over the ship, lower the lifting beam to pick up a container, hoist the container, and then travel toward the dock at speeds up to 410 feet per minute. At high speed, these movements would have left each container swinging from the long hoist cables, far above the deck. Les Harlander designed a special lifting spreader to solve the swing problem, testing its feasibility by building a model with his son’s Erector Set over Christmas of 1957.<sup>16</sup>

Weldon’s work had concluded by recommending a container 20 to 25 feet long. Harlander had the job of getting a design developed. In late 1957, Matson engaged Trailmobile, a manufacturer of truck trailers, to build two prototype containers and two chassis. Another contractor constructed two lifting spreaders and a steel frame that would simulate a container cell within a ship. Months of testing

followed. Gauges to measure strain were attached to the equipment, and the stresses were established as containers of various weights and densities were lowered into the cell, lifted out again, and placed on the chassis. The test cell was set at various angles to determine just how much clearance was needed between the containers and the vertical angle bars that formed the corners of the cell. Loaded boxes were stacked to measure the pressures on the bottom container, and lift trucks were run inside the containers to measure the strain on the floors.

When the results were in, Harlander's team decided that the most economical size for Matson was 8½ feet high and 24 feet long, 11 feet shorter than Pan-Atlantic's containers. The specifications took into account Weldon's finding that each pound of weight saved was worth 20 cents, each additional cubic foot inside the container worth \$20. To improve structural integrity, the roof would be a single sheet riveted in place rather than several panels attached with sheet metal screws, the design Trailmobile used for highway trailers. Steel corner posts would have to be able to support 120,000 pounds—the weight of several stacked containers, and much more than the posts in Pan-Atlantic's first containers could support. The doors, two layers of aluminum with stiffeners between, were designed to dovetail rather than to meet in a straight line, to withstand twisting pressure due to a ship's rolling in a heavy sea. The floor would be Douglas fir with tongue-and-groove joints. Special attachments to make the containers compatible with specific cranes and forklifts were ruled out on grounds of cost. "It takes very little in the way of extra features to add, say, \$200 to the cost of a container," Harlander commented. "There would be a marked change in the total profit picture if the equipment costs were, say, 10 percent higher than they need to be to do the job satisfactorily."<sup>17</sup>

Early in 1958, as McLean was preparing to open Pan-Atlantic's new route to Puerto Rico, the Pacific Coast Engineering Company (PACECO), the lowest of eleven bidders, won the contract to build Matson's first crane. PACECO was not comfortable with the unusual design, and it declared that it would not be responsible for swinging containers, problems with the trolley, or difficulties work-

ing as fast as Matson specified. Harlander agreed that Matson would take responsibility for the design, and PACECO began work on an A-shaped monstrosity rising 113 feet from the dock, with legs 34 feet apart so that two trucks or two railcars could pass beneath the crane. Trailmobile built 600 containers and 400 chassis to Matson's specifications. Matson developed a lashing system so that containers could be stacked up to five-high on deck, depending on their weight, without risk of damage at sea.<sup>18</sup>

Meanwhile, Weldon's research department pursued its quest for optimality by investigating the most efficient way to use Matson's fleet. Renting time on an IBM 704 computer at several hundred dollars a minute, the researchers built a fully fledged simulation model of the business, incorporating data on volume and costs for more than three hundred commodities at every port the company served at every time of year. Then they added in data on port labor costs, the current utilization of docks and cranes, and the load aboard each ship, to provide real-time answers to practical questions: Should a big Hawaii-bound ship call at Hilo and Lanai, or should it transfer its cargo to a feeder ship at Honolulu? What time of day should a vessel depart Honolulu so as to minimize total costs of delivering a load of pineapple to Oakland? Such simulations were new in the 1950s and had never been used in the shipping industry.<sup>19</sup>

Matson entered the container era on August 31, 1958, when the *Hawaiian Merchant* sailed from San Francisco with 20 containers on its deck and general cargo in its hold. The *Hawaiian Merchant* and five other C-3s were soon carrying 75 containers at a time, painstakingly loaded by old revolving cranes while the first of Matson's new cranes was being erected in Alameda, on the east side of San Francisco Bay. On January 9, 1959, the world's first purpose-built container crane went into operation, loading one 40,000-pound box every three minutes. At that rate, the Alameda terminal could handle 400 tons per hour, more than 40 times the average productivity of a longshore gang using shipboard winches. Similar cranes were installed in Los Angeles and Honolulu in 1960.<sup>20</sup>

By then, Matson had moved to phase two of the plan that Weldon had laid out at the start of 1957. The *Hawaiian Citizen*, another

C-3 freighter, was modified to carry containers stacked six high and six abreast in its holds as well as on its deck. Four vertical steel angle bars, attached to the ship's structure, were installed to constrain each stack of containers within the holds. At the top of each angle bar, a large steel angle helped guide the containers as the crane lowered them into place. The hatches were expanded so that every stack of containers was accessible to the crane, making the hatch covers so large, 52 feet by 54 feet, that the crane would have to lift them out of the way before starting work on the containers beneath. One of the five holds was outfitted with a cooling system and electrical hookups for refrigerated containers, and lights in the engine room gave warning if the temperature within any of the 72 refrigerated containers was too high or too low. After the hold was loaded and the hatch covers put into place, additional containers could be stacked two-high atop the covers, giving the ship a capacity of 408 25-ton containers. Maintaining stability was a constant problem, especially on heavily loaded runs to Hawaii; when necessary, Matson solved this by organizing the containers before loading so that the heaviest would go at the bottom of each stack, lowering the vessel's center of gravity.

The \$3.8 million conversion was completed in six months, and in May 1960 the *Hawaiian Citizen* began sailing a triangular route between Los Angeles, Oakland, and Honolulu. When the vessel arrived in port, the longshoremen first removed the lashings from the deck containers. The crane lifted the deck containers onto chassis pulled by transporters, which took them to the marshaling yard for onward shipment. Once the deck was clear, the crane lifted the hatch covers over one row and unloaded the first cell, occupied by a stack of six containers. The crane then switched to two-way operation. A transporter pulling an outbound container would pull beneath the crane, alongside one with an empty chassis. Every three minutes, the hoist would dive into the ship, lift an arriving container, move it to the waiting chassis, then pick up the outbound container from the other chassis and return to the ship. As it finished each row, the crane would move along the dock to position the boom directly over the next row. Instead of spending half its time in port, like other



ships, the *Hawaiian Citizen* was able to spend twelve and a half days of each fifteen-day voyage at sea, making money. Matson's cautious directors were so pleased that they agreed to spend \$30 million for containerships by 1964.<sup>21</sup>

By now, everyone in the close-knit maritime industry was talking containers. The talk, however, far outstripped the action. Aside from Matson in the Pacific and Pan-Atlantic, now renamed Sea-Land Service, on the Atlantic coast, very few ship lines were putting containers to routine use. Carriers needed to replace their war-era fleets, but they were afraid to do so at a moment when the shipping industry seemed to be on the cusp of technological change.

It was easy enough to conclude that containers would change the business, but it was not obvious that they would revolutionize it. Containers, said Jerome L. Goldman, a leading naval architect, were "an expedient" that would do little to reduce costs. Many experts considered the container a niche technology, useful along the coast and on routes to U.S. island possessions, but impractical for international trade. The risk of placing multimillion-dollar bets on what might prove to be the wrong technology was high. Sea-Land's ship-board cranes were indeed radically new, but they soon developed a reputation for maintenance problems that caused ships to be delayed. American President Lines, which sailed across the Pacific, created a container that attached to a single pair of wheels so that a truck could pull it without a chassis, but had to abandon the idea once the company added up the cost of giving every container extra structural elements to replace the chassis. The experience of Grace Line offered a graphic warning. Grace had won a \$7 million government subsidy to convert two vessels into containerships and spent another \$3 million on chassis, forklifts, and 1,500 aluminum containers, only to have longshoremen in Venezuela refuse to handle its highly publicized ships. Having badly misjudged the politics and the economics of container shipping, it would eventually sell the ships to Sea-Land at a loss. As a Grace executive noted ruefully, "The concept was valid, but the timing was wrong."<sup>22</sup>

Sea-Land itself was finding the container business difficult. Its Puerto Rico service was struggling against Bull Line, which controlled half the southbound trade and 90 percent of shipments from Puerto Rico to New York. Bull opened a trailership service in April 1960 and added containerships in May 1961, skimming some of the shippers McLean had hoped to convert to containers. Business on the mainland was not much better. A few food and drug companies, such as Nabisco and Bristol Myers, signed up right away to ship from New York-area factories to Houston, and Houston's chemical plants used containers to send fertilizers and insecticides to the Northeast. Most big industrial companies, though, were not desperate for container shipping. Ideas such as a combined sea-air service, with Sea-Land carrying cargo from New York to New Orleans and an airline taking it onward to Central America, found few takers. The cargo flow through Pan-Atlantic's home terminal at Newark jumped from 228,000 tons in 1957 to 1.1 million tons in 1959, as the Puerto Rico service began—and then abruptly stopped growing. Another longshore strike in 1959 did serious damage. Revenues fell. From 1957 through 1960, Sea-Land's container shipping business lost a total of \$8 million. McLean Industries was forced to suspend its dividend.<sup>23</sup>

In desperation, McLean tried in 1959 to buy Seatrail Lines, the only other coastal ship line in the East and an opponent of Waterman's efforts to secure operating subsidies on international routes. Seatrail's management turned him down. Competitors traded rumors that McLean Industries was near bankruptcy. Waterman, unprofitable without subsidies, was put up for sale, minus the cash and many of the ships that had made it so attractive to McLean in 1955.<sup>24</sup>

The problem, McLean decided, was the maritime mind-set: Pan-Atlantic's staff, experienced in the slow-moving ways of the maritime industry, did not know how to sell to an industrial traffic manager who cared not about ships, but about getting freight to the customer on schedule at low cost. McLean brought in a team of aggressive young trucking executives to turn the business around. He had agreed not to poach McLean Trucking employees when he gave up the trucking company in 1955. Now, former McLean

Trucking employees, many of them still in their twenties or early thirties, began moving into key positions at Pan-Atlantic, alongside young talent head-hunted from other big truck lines.

“They were just recruiting,” one of those hires remembered. “It was like a football draft. You recruit the best quarterback.” Many were invited to Newark without being told what job McLean had in mind for them. When they arrived, they were given intelligence and personality tests—a rare practice in the 1950s. McLean wanted people who were smart, aggressive, and entrepreneurial; the wrong test scores meant no job offer. Education did not matter; although Malcom McLean had a box at the Metropolitan Opera, intellectual airs were frowned upon, and new hires were advised to fracture their grammar to fit in with a crowd of truckers. “When we had nothing else to do, we would stand and pitch pennies,” remembered naval architect Charles Cushing, an MIT graduate who joined the company in 1960. “They don’t teach you to pitch pennies at the Wharton School.”<sup>25</sup>

Those who made the grade were given large responsibilities. Bernard Czachowski was hired from McLean Trucking to oversee Pan-Atlantic’s vital relations with the independent truck lines that picked up and delivered its freight. Kenneth Younger, from Roadway Freight, came to manage the Puerto Rican business. Paul Richardson, who had entered McLean Trucking’s management training program out of college in 1952 and had stayed with the truck line when McLean spun it off, signed on as New England sales manager in 1960 and within eight months was in charge of sales nationwide. Richardson’s secret weapon was a simple form with the pompous title “Total Transportation Cost Analysis.” The form provided a side-by-side comparison of the costs of shipping a product by truck, rail, and containership, including not just transportation rates, but also local pickup and delivery, warehousing, and insurance costs. Salesman were instructed to add up each column to show the saving containers would bring, and then multiply by the number of loads the company shipped over the course of a year. The bottom line was the total annual saving, a number much more likely to be large, and memorable, than the traditional measure of a few dollars per ton.<sup>26</sup>

The Pan-Atlantic name was dropped in early 1960, and the ship line was rechristened Sea-Land Service to emphasize that it was a new venture on the leading edge of the freight industry. The work was seven days a week, an exciting, demanding environment. Memos were not wanted. Conflict among executives was a given; managers were expected to meet, thrash out their differences, and act. Performance was measured constantly, and rewarded not with cash but with stock in the fast-growing company. Decades later, those early Sea-Land employees remembered the years when they were creating the container shipping industry as the best time of their lives. “It was a hard-charging, fast-charging company. Malcom would give us assignments and we didn’t ask questions, we just went out and did ’em,” one said. Malcom McLean—universally called Malcom behind his back, but addressed by every single employee as Mr. McLean—presided over it all, constantly checking the numbers, making sure that the cash flowed.<sup>27</sup>

After a stinging \$1.5 million loss in 1960, McLean sought to cope with adversity in his usual way: by plunging deeper into debt. In 1961 Sea-Land bought four World War II tankers and lengthened them by inserting large sections, known as midbodies, built in a German shipyard. These “jumboized” vessels could carry 476 containers—twice as many as Sea-Land’s existing containerships, eight times as many as the *Ideal-X*. Competitors complained that the German reconstruction made Sea-Land’s vessels ineligible to sail domestic routes as “American” ships, but to no avail. The government approved McLean’s application to put the ships into service between Newark and California in 1962, making Sea-Land the only intracoastal ship line. The unbalanced trade made the economics of the intracoastal route treacherous: the eastbound service, heavy with canned fruits and vegetables from California’s Central Valley, handled ten thousand tons a month, but California-bound ships carried only seven thousand tons and lots of empty containers. Those same economics, though, assured that there would be no serious competition on the intracoastal route. There simply was not enough freight.<sup>28</sup>



Even as Sea-Land expanded to the West Coast, McLean kept a close eye on Puerto Rico. Puerto Rico was an attractive market for U.S. ship lines. The economy was growing by leaps and bounds under the commonwealth government's economic development program, Operation Bootstrap. The program, featuring generous tax incentives, lured hundreds of U.S.-based manufacturers to what in the 1950s had been an impoverished and heavily agricultural island. They would import their raw materials from the U.S. mainland, use cheap Puerto Rican labor for assembly, and ship their products back to the United States. Private fixed investment in Puerto Rico had more than doubled between 1953 and 1958, and the island's economic output was growing 8 to 10 percent per year. This boom meant rapidly rising demand for shipping—and, thanks to complex U.S. laws governing the maritime sector, only U.S. domestic ship lines could handle the trade. Foreign-owned companies and the U.S. companies subsidized to sail international routes were ineligible.<sup>29</sup>

Sea-Land had been sailing to San Juan since 1958, but its service was less than exemplary. It owned no terminal. Incoming containers with freight for multiple customers were unstuffed in old aluminum warehouses near the dock, where the contents often sat for months because there was no system for notifying customers that their freight had arrived. Containers trucked elsewhere on the island tended to disappear, to be converted into shops, storage sheds, or homes. "It was chaotic," recalled an executive in the Puerto Rico operation. Sea-Land's efforts to gain market share in Puerto Rico had made little headway. Bull Insular Line, the dominant carrier, controlled more than half the shipments from the mainland to Puerto Rico and 90 percent of the freight headed north.<sup>30</sup>

In March 1961, McLean Industries made a surprise offer to buy Bull Line. The \$10 million bid was an enormous stretch for a company that was at the limit of its resources. McLean Industries' huge loss in 1960 had wiped out all of its retained earnings. Sea-Land had negative net worth of \$1.1 million, although McLean's accounting made the company's situation look worse than it really was. Bull Line was heavily indebted as well, having lost money in the two

prior years trying to compete with Sea-Land. Its owners were eager to sell out. The attraction for McLean was that the deal would give Sea-Land a near-monopoly in the Puerto Rico trade—which is exactly why federal antitrust authorities opposed it. Bull's directors received government telegrams advising them not to proceed with the sale to McLean, and they quickly found another buyer. McLean was left to seek revenge by trying to block Bull's efforts to acquire two used ships from the navy.<sup>31</sup>

Then came a remarkable stroke of good fortune: the company that purchased Bull Line, a privately owned maritime conglomerate, had expanded its way into financial trouble. It first stopped reconstruction on the two ships it had acquired for Bull Line, and then, in June 1962, stopped sailing altogether. As Bull Line collapsed into bankruptcy, McLean was able to grab the two ships. Overnight, Sea-Land became the dominant carrier to an island that was almost totally dependent upon U.S. shipping. Before new competitors could move in, it quickly consolidated its position, scheduling containerships from Newark to San Juan every two days and adding sailings from the West Coast and Baltimore. Sea-Land spent more than \$2 million on two new terminals in San Juan in 1962 and 1963. In a politically deft move, it also opened routes to the Puerto Rican ports of Ponce and Mayaguez. Neither city had much besides canned tuna to ship out in containers, but providing container service earned McLean the goodwill of Teodoro Moscoso, the creator of Operation Bootstrap and a powerful figure in Puerto Rico's economic development.<sup>32</sup>

The expansion of Sea-Land's Puerto Rico service coincided with a remarkable flourishing of the island's economy. In the 1950s, Operation Bootstrap had attracted mainly small, labor-intensive factories to Puerto Rico. Many workers gained regular wage employment for the first time, and the resulting rise in personal income drove a surge in consumer spending. Retail sales rose 91 percent between 1954 and 1963 after adjustment for inflation. A large share of that merchandise came from the mainland, filling the southbound ships in the Puerto Rico trade. As the island's rising wages began to make it less attractive for labor-intensive factories, Operation Bootstrap

undertook a concerted drive to bring in large, capital-intensive manufacturers. Manufacturing, only 18 percent of Puerto Rico's economic output in 1955, reached 21 percent in 1960 and 25 percent by 1970, with most of the growth coming in nontraditional sectors such as pharmaceuticals and metal products. Total trade between Puerto Rico and the mainland nearly trebled during the 1960s, and almost all of it went by ship.<sup>33</sup>

Sea-Land benefited from this boom—but it also helped cause it. Puerto Rico's shipping-dependent economy had been a prisoner of high transport costs. Between 1947 and 1957, as U.S. prices overall were rising 31 percent, rates per ton for shipping between the mainland and Puerto Rico increased about 50 percent. Federal regulators approved five general rate increases over that decade, effectively taxing Puerto Rican consumers to cover the inefficiencies of U.S.-flag ship lines. McLean's push into the Puerto Rico trade in 1958 began to shake up this rate structure, which benefited mainly Bull Line. Over the ensuing decade, by Sea-Land's estimates, the cost of shipping consumer goods from New York to San Juan fell 19 percent, and the average rate per ton for freight shipped in full truckloads fell by a third. Lower southbound rates for industrial components and northbound rates for finished products magnified the advantages of opening factories in Puerto Rico, and McLean Industries established a new subsidiary to help manufacturers locate there. By 1967, Sea-Land was carrying 1,800 containers each week between the island and the U.S. mainland, half of them to or from Puerto Rican factories.<sup>34</sup>

Its unassailable position in Puerto Rico provided a firm base for Sea-Land's growth. Sea-Land owned 7,848 containers, 4,876 chassis, and 386 tractors at the end of 1962. By the end of 1965, it had expanded to 13,535 containers and controlled 15 containerships calling at 15 ports, using Puerto Rico as a hub to serve the Virgin Islands. At the center of this expanding empire was a new office building at Port Elizabeth, New Jersey, where the berths at the new Sea-Land terminal, the first purpose-built container terminal anywhere, were visible out the window. The building, like the rest of the Port Elizabeth complex, was built by the Port of New York Au-

thority, without a nickel of Sea-Land's money. "A lot of people thought Malcom was building a big pagoda," recalled Gerald Toomey, who was recruited to Sea-Land in 1962. "He knew what he was doing. You put a pencil to what that building cost and what it's saved the company, it turned out to be a very good deal."<sup>35</sup>

Sea-Land was a large company by 1963, with nearly three thousand employees, and an increasingly difficult one to manage. Computers had arrived in 1962, but only for administrative purposes such as payroll; at Port Elizabeth, Sea-Land kept track of its incoming and outgoing boxes on magnetic boards high on the walls of its octagonal control room, with an employee reaching a long pole to move the corresponding metal piece on the board each time a container was moved in the yard. At the end of each day, photos were taken of the board to provide a permanent record. Containers had a way of vanishing, especially in Puerto Rico, where a lack of warehouse space led many recipients to store goods in the containers they arrived in; headquarters produced an "aging report" listing containers that had not been seen for a week, and local supervisors frantically worked the phones to try to locate missing boxes before a manager called. Loading required teams of vessel planners to pore over sheets listing the weight and destination of each container as they figured out the best way to load each ship. Computers would not begin to take on that job until 1965.<sup>36</sup>

Malcom McLean could no longer be involved in every decision. Yet his basic approach to management remained unchanged. McLean was still a daily presence at headquarters. "It wasn't unusual that when you came to work, he'd say, 'Good morning, how are you doing this morning?'" recalled a long-time Sea-Land accountant. "Malcom was a good salesman. He'd give the impression that he knew you." When a building for consolidating container loads was needed in Baltimore or Jacksonville, McLean would go and choose the site. When refrigerated containers were needed, managers would spend two days debating how many to buy, only to hear McLean say, "I appreciate the exercise, but I've already signed a contract for five hundred." When the chance came to buy Alaska Freight Lines in 1963, McLean hardly bothered to investi-

gate the company's finances, much less such operational issues as access to Anchorage harbor in the winter; McLean was in a hurry, and the chance to break into the Alaska trade quickly was too good to pass up.<sup>37</sup>

Above all, he kept his eye on the money. Teletypes clattered constantly as outlying terminals sent booking information to headquarters. Clerks updated records showing how many days each container had carried revenue traffic, how many tons it had hauled, how many dollars it had grossed. Geographic analysis documented the land transportation patterns of Sea-Land cargo. Monthly financial reports revealed how much revenue Sea-Land received from each commodity shipped from Newark to Texas, reminding all that an eighteen-ton container of liquor was twice as profitable as a four-ton container of toys. Weekly reports documented cash flow. And there was an endless stream of demands for better cost control. Shaving 1.6 cents off the cost of handling 100 pounds in Ponce could save \$14,300 a year. One more container lift per gang hour would save \$180,000. Limiting long-distance telephone calls to three minutes would save \$65,000. "Probably more attention was paid to financial results there than you find in any company around today," remembered Earl Hall, later Sea-Land's chief financial officer. In 1961, its sixth year, Sea-Land's container business had finally moved into the black. So long as McLean was involved in running it, Sea-Land never lost money again.<sup>38</sup>



27. The spreader bar is covered by U.S. Patent 2,946,617, issued July 26, 1960.

28. Information about delays taken from Tantlinger interview, and the announcement of the start date is in “Tank Vessels Begin Trailer Runs in April,” *JOC*, February 19, 1956. Houston comment is cited in Marc Felice, “The Pioneer,” article appearing in program for the AOTOS Award 1984. For cost figures, see Pierre Bonnot, “Prospective Study of Unit Loads,” *Containers*, no. 36 (December 1956): 25–29.

29. Pan-Atlantic Steamship Corporation, “Summary of Operations.”

30. “ICC Aide Urges Waterman Sale,” *NYT*, November 28, 1956, p. 70; ICC, *McLean Trucking Company and Pan-Atlantic Steamship Corporation—Investigation of Control*.

31. Borruet, *Le port de Marseille*, p. 296. Fitzgerald, “A History of Containerization,” p. 2. For photos of Seatrain’s vessels on trial in 1928, see *Fairplay*, June 17, 1976, p. 15.

32. Cangardel, “The Present Development of the Maritime Container.”

## Chapter 4 The System

1. Author’s telephone interview with Robert N. Campbell, June 25, 1993.

2. Tantlinger, “U.S. Containerization”; Cushing, “The Development of Cargo Ships.”

3. The containers, chassis, refrigerated units, and twist locks all are covered by patent 3,085,707, issued after much delay on April 16, 1963.

4. Campbell interview; Tantlinger, “U.S. Containerization.” Skagit Steel and Iron was closed in the early 1990s, and most of the company’s records were destroyed.

5. *Marine Engineering/Log* (November 1955), p. 104; Tantlinger, “U.S. Containerization”; PNYA, Minutes of Committee on Operations, February 2, 1956, Meyner Papers, Box 44; Paul F. Van Wicklen, “New York—The Port That Gave Containerization Its Oomph” in Containerization and Intermodal Institute, “Containerization: The First 25 Years” (New York, 1981); “Tanker to Carry 2-Way Loads,” *NYT*, April 27, 1956. The conversion of the C-2s is discussed in “Full-Scale Container Ship Proves Itself,” *Marine Engineering/Log* (December 1957), p. 67, and in author’s telephone interview with Robert N. Campbell, June 25, 1993. Bonner quotation appears in McLean Industries, *Annual Report*, 1957, p. 8.

6. McLean Industries, *Annual Report*, 1957 and 1958.

7. McLean Industries, *Annual Report*, 1958; Campbell interview.

8. Author's telephone interview with Earl Hall, October 2, 1992; author's telephone interview with William Hubbard, July 1, 1993; author's interview with Charles Cushing, New York, April 7, 1993.

9. William L. Worden, *Cargoes: Matson's First Century in the Pacific* (Honolulu, 1955), p. 120.

10. Ibid., pp. 114–120; Fitzgerald, "A History of Containerization," pp. 39–41.

11. Matson's caution was described in author's telephone interview with Leslie A. Harlander, November 2, 2004. Observation about hiding pedigrees is from Cushing interview. On Weldon's background, see statement of Matson president Stanley Powell, Jr., U.S. House of Representatives, Committee on Merchant Marine and Fisheries, *Cargo Container Dimensions*, November 1, 1967, pp. 48–49. Weldon comment appears in his "Cargo Containerization in the West Coast–Hawaiian Trade," *Operations Research* 6 (September–October 1958): 650.

12. Weldon, "Cargo Containerization," p. 652–655.

13. Ibid., p. 661–663.

14. Les Harlander, interview by Arthur Donovan and Andrew Gibson, June 19, 1997, COHP.

15. Harlander interview, COHP; letter, Keith Tantlinger to George D. Saunders, December 3, 1992 (copy in possession of author). In the letter, Tantlinger states, "I caught Les Harlander prowling the vessel to apparently see what he could learn, and I asked him to leave the ship." In a telephone interview with the author, November 2, 2004, Harlander recalled that he had visited the ship as a guest of Pan-Atlantic.

16. Harlander interview, COHP; American Society of Mechanical Engineers, *The PACECO Container Crane*, brochure prepared for dedication of national historic mechanical engineering landmark, Alameda, California, May 5, 1983. Details of the swinging device are in L. A. Harlander, "Engineering Development of a Container System for the West Coast–Hawaiian Trade," *Transactions of the Society of Naval Architects and Marine Engineers* 68 (1960): 1079.

17. Harlander interview, COHP; Harlander, "Engineering Development," p. 1053. The containers apparently were well made; in 1981, 23 years after they were built, 85 percent of the original production run of 600 containers were still in service. Harlander interview, COHP.

18. Negotiations with PACECO are recounted in Harlander interview, COHP; the lashing system is described in Harlander, "Engineering Development," p. 1084.

19. Foster Weldon, "Operational Simulation of a Freighter Fleet," in National Research Council, *Research Techniques in Marine Transportation*, Publication 720 (Washington, DC, 1959), pp. 21–27.

20. Fitzgerald, “A History of Containerization,” p. 47; American Society of Mechanical Engineers, *The PACECO Container Crane*.

21. Leslie A. Harlander, “Further Developments of a Container System for the West Coast–Hawaiian Trade,” *Transactions of the Society of Naval Architects and Marine Engineers* 69 (1961): 7–14; Fitzgerald, “A History of Containerization,” pp. 57–59; Worden, *Cargoes*, pp. 143–144.

22. Benjamin Chinitz, for example, devoted only a couple of mentions to containerization, predicting in 1960 that “in the next few decades” few places would have piggyback (container on railcar) service and even fewer would have maritime service with containers; see *Freight and the Metropolis: The Impact of America’s Transport Revolution on the New York Region* (Cambridge, MA, 1960), pp. 83, 86, and 161. Jerome L. Goldman, “Designed to Cut Cargo-Handling Costs,” *Marine Engineering/Log* (1958), p. 43. McLean Industries, *Annual Reports*, 1957–60; Campbell interview; John Niven, *American President Lines and Its Forebears, 1848–1984* (Newark, DE, 1987), p. 211; Grace’s plans were described in U.S. Department of Commerce, *Annual Report of the Federal Maritime Board and Maritime Administration*, 1958, p. 4; Edward A. Morrow, “All-Container Ship Welcomed by Port on Her Debut,” *NYT*, January 13, 1960; John P. Callahan, “Container Vessel on First Run,” *NYT*, January 30, 1960; “Grace Initiates Seatainer Service,” *Marine Engineering/Log* (1960), p. 55; Harold B. Meyers, “The Maritime Industry’s Expensive New Box,” *Fortune*, November 1967. The ILA may have been behind Venezuelan dockers’ refusal to handle Grace’s containers; see George Panitz, “NY Dockers Map Annual Wage Drive,” *JOC*, December 20, 1961.

23. PNYA, *Annual Report*, various years; “Puerto Rico Trailer Service,” *NYT*, April 22, 1960; “Bull Line Gets Container Ships,” *NYT*, May 5, 1961; “Transport News: Sea-Land Service,” *NYT*, December 17, 1959. Financial information for Pan-Atlantic and Sea-Land Service is from ICC, *Transport Statistics*, Part 5, Table 4, various years. For the parent company’s losses, see McLean Industries, *Annual Report*, 1960. Gerald Toomey, then with Consolidated Freightways, a large truck line, recalled that Consolidated’s chairman predicted in 1962 that Sea-Land would not last two years; author’s interview, New York, May 5, 1993.

24. Edward A. Morrow, “Seatrains Spurns Shipping Merger,” *NYT*, August 12, 1959. Campbell interview; McLean Industries, *Annual Report*, 1958.

25. “Just recruiting” comment from author’s interview with Gerald P. Toomey, May 5, 1993. On use of intelligence and personality tests, see Arthur Donovan and Andrew Gibson interview with Scott Morrison, July 8, 1998, COHP. Comment on pitching pennies from Cushing interview, April 7, 1993.

26. Author's interview with Paul Richardson, Holmdel, NJ, January 14, 1992; author's telephone interview with Kenneth Younger, December 16, 1991; author's telephone interview with William Hubbard, July 1, 1993.

27. Container tonnage from PNYA *Annual Reports*. Quotation is from author's interview with naval architect Charles Cushing, who joined Sea-Land in 1960.

28. Sea-Land Service, presentation to Sea-Land management meeting, Hotel Astor, New York, December 12–14, 1963, mimeo.

29. Werner Baer, "Puerto Rico: An Evaluation of a Successful Development Program," *Quarterly Journal of Economics* 73, no. 4 (1959): 645–671; A. W. Maldonado, *Teodoro Moscoso and Puerto Rico's Operation Bootstrap* (Gainesville, 1997).

30. Author's interview with Gerald Toomey, May 5, 1993; author's interview with William B. Hubbard, July 1, 1993; Edward A. Morrow, "U.S. Antitrust Inquiry Begun into Proposed Sale of Bull Lines," *NYT*, March 29, 1961.

31. Sea-Land's practice was to write off its ships over six years, an unusually short period for long-lived assets. Very high write-offs made the short-term profit picture look bleak, but it meant that Sea-Land could report very high profits a few years later, once the ships had been fully depreciated. This accounting, deliberately designed to depress short-term profitability, was not widely appreciated by analysts who examined the company's financial reports. In the mid-1960s, the Internal Revenue Service forced Sea-Land to depreciate its ships over fifteen years instead of six, and its financial reporting became less obscure. Author's telephone interview with Earl Hall, May 21, 1993, and McLean Industries *Annual Report*, 1965. Concerning the bid for Bull Line, see George Horne, "Bull Steamship Company Sold to Manuel Kulukundis Interests," *NYT*, April 22, 1961; Edward A. Morrow, "Decision Put Off in Bull Line Case," *NYT*, August 4, 1961. The attempt to block the sale of the ships to Bull was one of the more embarrassing episodes of McLean's career. He told a hastily called congressional hearing on the issue that the government program to sell old vessels to nonsubsidized ship lines was a "give-away program," and was then forced to admit that Waterman had applied for ships under the same program; the Waterman application, he said, was "a mistake," although one that he had not tried to correct. "McLean Attacks Ship Exchanges," *NYT*, August 17, 1961.

32. "Bull Line Stops Puerto Rico Runs," *NYT*, June 25, 1962; "Sea-Land to Add to Trailer Runs," *NYT*, June 26, 1962; author's interview with Gerald Toomey, May 5, 1993; author's interview with William B. Hubbard, July 1, 1993; author's telephone interview with Amadeo Francis, April 28, 2005.

33. Toomey interview; U.S. Census Bureau, *Statistical Abstract*, various issues.

34. Sea-Land Service, "The Importance of Containerized Ocean Transportation Service to Puerto Rico," mimeo, n.d. (1969).

35. McLean Industries, *Annual Reports*, 1962 and 1965; Cushing interview; McLean Industries, *Annual Report*, 1962; Toomey interview.

36. Employment figures from ICC, *Transport Statistics*, 1963, Part 5, Table 4. Author's interview with Richard Healey, January 19, 1994; Toomey interview, Richardson interview, July 12, 1992; Hubbard interview.

37. "It wasn't unusual" from Healey interview; Campbell interview; Hubbard interview; Richardson interview, January 14, 1992; George Parnitz, "Sea-Land Plans Alaska Service," *JOC*, April 1, 1964.

38. Hall interview; presentations to Sea-Land management meeting, Hotel Astor, New York, December 12–14, 1963; ICC, *Transport Statistics*, various issues.

## Chapter 5

### The Battle for New York's Port

1. Chinitz, *Freight and the Metropolis*, pp. 21, 50. The number of piers is given in a letter from Edward F. Cavanagh, Jr., New York City commissioner of marine and aviation, to Board of Inquiry on Longshore Work Stoppage, January 14, 1952, in Jensen Papers, Collection 4067, Box 16. For a description of the New Jersey freight yards, see Carl W. Condit, *The Port of New York*, vol. 2, *The History of the Rail and Terminal System from the Grand Central Electrification to the Present* (Chicago, 1981), pp. 103–107. Attempts by New Jersey interests to eliminate the single rate led to the formation of the PNYA in 1921. See Jameson W. Doig, *Empire on the Hudson: Entrepreneurial Vision and Political Power at the Port of New York Authority* (New York, 2001).

2. Estimates of truck share of total cargo are based on unpublished PNYA data cited in Chinitz, *Freight and the Metropolis*, p. 41. Average waiting time appears in PNYA, "Proposal for Development of the Municipally Owned Waterfront and Piers of New York City," February 10, 1948, p. 64; *NYT*, May 17, 1952.

3. Waterfront Commission of New York Harbor, *Annual Report for the Year Ended June 30, 1954*, p. 33, and *Annual Report for the Year Ended June 30, 1955*, p. 13. Interesting light on the union's view of public loaders can be found in a July 28, 1952, letter from Waldman & Waldman, the ILA's counsel, to ILA president Joseph P. Ryan recommending changes in the operation of Local 1757, in Vertical File, "International Longshoremen's Association," Tamiment Library, New York University. A formal list of



## Chapter 14

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### Just in Time

**B**arbie was conceived as the all-American girl. In truth, she never was: at her inception, in 1959, Mattel Corp. arranged to make her at a factory in Japan. A few years later it added a plant in Taiwan, along with a large cadre of Taiwanese women who sewed Barbie's clothes in their homes. By the middle of the 1990s, Barbie's citizenship had become even less distinct. Workers in China produced her statuesque figure, using molds from the United States and other machines from Japan and Europe. Her nylon hair was Japanese, the plastic in her body from Taiwan, the pigments American, the cotton clothing from China. Barbie, simple girl though she is, had developed her very own global supply chain.<sup>1</sup>

Supply chains like Barbie's are a direct result of the changes wrought by the rise of container shipping. They were unheard-of back in 1956, when Malcom McLean placed his first containers on board the *Ideal-X*, and in 1976, when high oil prices brought sky-high freight costs that stifled the flow of world trade. Until then, vertical integration was the norm in manufacturing: a company would obtain raw materials, sometimes from its own mines or oil wells; move them to its factories, sometimes with its own trucks or ships or railroad; and put them through a series of processes to turn them into finished products. As freight costs plummeted starting in

the late 1970s and as the rapid exchange of cargo from one transportation carrier to another became routine, manufacturers discovered that they no longer needed to do everything themselves. They could contract with other companies for raw materials and components, locking in supplies, and then sign transportation contracts to assure that their inputs would arrive when needed. Integrated production yielded to disintegrated production. Each supplier, specializing in a narrow range of products, could take advantage of the latest technological developments in its industry and gain economies of scale in its particular product lines. Low transport costs helped make it economically sensible for a factory in China to produce Barbie dolls with Japanese hair, Taiwanese plastics, and American colorants, and ship them off to eager girls all over the world.

These possibilities first drew notice in the early 1980s, when the world discovered just-in-time manufacturing. Just-in-time, a concept originated by Toyota Motor Company in Japan, involves raising quality and efficiency by eliminating large inventories. Rather than making most of its own components, as competitors did, Toyota signed long-term contracts with outside suppliers. The suppliers were intimately involved with Toyota, helping design its products and knowing the details of its production plans. They were required to adopt strict quality standards, with very low rates of error, so that Toyota would not need to test the components before using them. The suppliers agreed to make their goods in small batches, as required for Toyota's assembly lines, and to deliver them within very narrow time windows for immediate use—hence the name, just-in-time. Keeping inventory to a minimum brought discipline to the entire manufacturing process. With few components in stock, there was little margin for error, forcing every firm in the supply chain to perform as required.<sup>2</sup>

The wonders of just-in-time were unmentioned outside Japan before 1981. In 1984, as Toyota agreed to assemble cars at a General Motors plant in California, U.S. business publications ran thirty-four articles on just-in-time. In 1986, there were eighty-one, and companies around the world were seeking to emulate Toyota's high-profile success. In the United States, two-fifths of the Fortune 500

manufacturers had started just-in-time programs by 1987. Overwhelmingly, these companies found that just-in-time required them to deal with transportation in a very different way. No more would manufacturers offer a load or two to some truck line's hungry salesman. Now, they wanted large-scale relationships with a much smaller number of carriers able to meet stringent requirements for on-time delivery. Customers demanded written contracts that imposed penalties for delays. Even shipments from another continent were expected to arrive on schedule. Railroads, ship lines, and truck lines with large route networks and sophisticated cargo-tracking systems had the edge.<sup>3</sup>

Before the 1980s, logistics was a military term. By 1985, logistics management—the task of scheduling production, storage, transportation, and delivery—had become a routine business function, and not just for manufacturers. Retailers discovered that they could manage their own supply chains, cutting out the wholesalers that had stood between manufacturers and consumers. With modern communications and container shipping, the retailer could design its own shirts and transmit the designs to a factory in Thailand, which used local labor to combine Chinese fabric made from American cotton, Malaysian buttons made from Taiwanese plastics, Japanese zippers, and decorations embroidered in Indonesia. The finished order, loaded into a 40-foot container, would be delivered in less than a month to a distribution center in Tennessee or a *hyper-marché* in France. Global supply chains became so routine that in September 2001, when U.S. customs authorities stepped up border inspections following the terrorist attack that destroyed the World Trade Center in New York, auto plants in Michigan began shutting down within three days for lack of imported parts.

The improvement in logistics shows up statistically in reduced inventory levels. Inventories are a cost: whoever owns them has had to pay for them but has yet to receive money from selling them. Better, more reliable transport has permitted companies to obtain goods closer to the time they need them, instead of weeks or months in advance, tying up less money in goods sitting uselessly on warehouse shelves. In the United States, inventories began falling in the

mid-1980s, as the concepts of just-in-time manufacturing took root. Manufacturers such as Dell and retailers such as Wal-Mart Stores have taken the concept to extremes, designing their entire business strategies around moving goods from factory floor to customer with minimal time in between. In 2004, nonfarm inventories in the United States were about \$1 trillion lower than they would have been had they stayed at the level of the 1980s, relative to sales. Assume that the money needed to finance those inventories would have to be borrowed at 8 or 9 percent, and inventory reductions are saving U.S. businesses \$80–\$90 billion per year.<sup>4</sup>

This precision performance would have been unattainable without containerization. So long as cargo was handled one item at a time, with long delays at the docks and complicated interchanges between trucks, trains, planes, and ships, freight transportation was too unpredictable for manufacturers to take the risk that supplies from faraway places would arrive right on time. They needed to hold large stocks of components to ensure that their production lines would keep moving. The container, combined with the computer, sharply reduced that risk, opening the way to globalization. Companies can make each component, and each retail product, at the cheapest location, taking wage rates, taxes, subsidies, energy costs, and import tariffs into account, along with considerations such as transit times and security. The cost of transportation is still a factor in the cost equation, but in many cases it is no longer a large one.

Globalization, historians and economists have hastened to point out, is not a new phenomenon. The world economy became highly integrated in the nineteenth century. The decline of tariffs and other trade barriers in the years following the Napoleonic Wars led international trade to increase after decades of stagnation, and the introduction of the oceangoing steamship in the 1840s sharply reduced transport costs. Ocean freight rates fell 70 percent between 1840 and 1910, encouraging increased shipment of commodities and manufactured goods around the world, while the telegraph—the nineteenth-century counterpart of the Internet—gave people in one

location current information about prices in another. Prices of grain, meat, textiles, and other commodities converged across borders, as traders found it easy to increase imports whenever domestic prices rose or domestic wages got out of hand.<sup>5</sup>

The globalization of the late twentieth century took on quite a different character. International trade is no longer dominated by essential raw materials or finished products. Fewer than one-third of the containers imported through southern California in 1998 contained consumer goods. Most of the rest were links in global supply chains, carrying what economists call “intermediate goods,” factory inputs that have been partially processed in one place and will be processed further someplace else. The majority of the metal boxes moving around the world hold not televisions and dresses, but industrial products such as synthetic resins, engine parts, wastepaper, screws, and, yes, Barbie’s hair.<sup>6</sup>

In international production-sharing arrangements of this sort, the manufacturer or retailer at the top of the chain will find the most economical place for each part of the process. This used to be impossible: high transportation costs acted as a trade barrier, very similar in effect to high tariffs on imports, sheltering the jobs of production workers from foreign competition but imposing higher prices on consumers. As the container made international transportation cheaper and more dependable, it lowered that barrier, decimating manufacturing employment in North America, Western Europe, and Japan, by making it much easier for manufacturers to go overseas in search of low-cost inputs. The labor-intensive assembly will be done in a low-wage country—but there are many low-wage countries. The various components and raw materials will come from whichever location can supply them most cheaply—but costs in different locations often are quite similar. Even small changes in transport costs can be decisive in determining where each stage of the process will occur.<sup>7</sup>

The economics of containerization have shaped these global supply chains in peculiar ways. Distance matters, but not hugely so. A doubling of the distance cargo is shipped—from Hong Kong to Los Angeles, for example, rather than Tokyo to Los Angeles—raises the



shipping cost only 18 percent. Places far from the end market can still be part of an international supply chain, so long as they have well-run ports and a lot of volume.<sup>8</sup>

Container shipping thrives on volume: the more containers moving through a port or traveling on a ship or train, the lower the cost per box. Places with lower demand or poorer infrastructure will face higher transport costs and will be far less attractive manufacturing sites for the global market. In the 1970s and 1980s, when many U.S. industrial centers were dying, Los Angeles thrived as a factory location because it was home to the nation's busiest containerport, and Los Angeles thrived as a port because it was well located to handle import volume from Asia, not just for California, but for the entire United States. The Pacific Rim became the world's workshop for consumer goods, in good part, because large ports for containers gave it some of the world's lowest shipping costs. Antwerp spent a stunning \$4 billion on port expansion between 1987 and 1997, including expropriation of 4,500 acres (2,000 hectares) of land, just to keep itself in the game. Conversely, African countries with inefficient ports and little containership service are at such a transport-cost disadvantage that even rock-bottom labor costs will not attract investment in manufacturing.<sup>9</sup>

Shippers in places with busy ports and good land-transport infrastructure not only enjoy lower freight rates, but they also benefit from the shortest shipping times. Before the container, when breakbulk vessels like the *Warrior* carried most of the world's trade, cargo typically left the factory weeks before the ship departed, sailed at a glacial 16 knots, and spent an unproductive week in the hold each time the vessel called at an additional port. In the container age, a machine manufactured on Monday can be dropped at Port Newark on Tuesday and delivered in Stuttgart, Germany, in less time than it once would have taken to be loaded aboard a ship such as the *Warrior*. Yet time still matters. By one estimate, each day sea-borne goods spend under way raises the exporter's costs by 0.8 percent, which means that a typical 13-day voyage from China to the United States has the same effect as a 10 percent tariff. The time savings represent a huge competitive advantage to shippers located

near a major port. Those served by smaller ports may have to endure longer wait times between ships or shuttle links to a larger port, adding time, and hence costs, to every shipment. Air freight all but eliminates the costs of time, but it is too expensive for most goods that are made in poor countries precisely because little value is added in their production.<sup>10</sup>

“Any change in technology,” the economist Joel Mokyr observed, “leads almost inevitably to an improvement in the welfare of some and to a deterioration in that of others.” That was as true of the container as of other technologies, but on an international scale. Containerization did not create geographical disadvantage, but it has arguably made it a more serious problem.<sup>11</sup>

Before the container, shipping was expensive for everyone. The most expensive part of international freight transportation, loading cargo aboard ship, affected all shippers equally. Containerization has reduced international transport costs for some much more than for others. Landlocked countries, inland places in countries with poor infrastructure, and countries without enough economic activity to generate high demand for container shipping may have a tougher competitive situation now than they did in breakbulk days. Being landlocked, one study calculated, raises a country’s average shipping costs by half. Another study found that it cost \$2,500 to ship a container from Baltimore, on the U.S. Atlantic coast, to Durban, in South Africa—and \$7,500 more to haul it by road the 215 miles from Durban to Maseru, in Lesotho. Within China, the World Bank reported in 2002, transporting a container from a central city to a port cost three times as much as shipping it from the port to America.<sup>12</sup>

And if high shipping costs, high port costs, and long waiting times do not leave a country at an economic disadvantage, a cargo imbalance might. Relatively few routes, it turns out, have an evenly balanced flow of maritime exports and imports. When the flow is out of balance, shippers in the more heavily trafficked direction have to pick up the cost of sending empty containers back in the other direction. In 1998, nearly three-quarters of the containers sent northbound from Caribbean islands to the United States were empty, re-

sulting in much higher shipping costs for the southbound imports of food and consumer goods on which these island-states depend.<sup>13</sup>

The revolutionary days of container shipping were over by the early 1980s. Yet the aftereffects of the container revolution continued to reverberate. Over the next two decades, as container shipping began to drive international freight costs down, the volume of sea freight shipped in containers rose four times over. Hamburg, Germany's largest port, handled 11 million tons of general cargo in 1960; in 1996, more than 40 million tons of general cargo crossed the Hamburg docks, 88 percent of it in containers, and more than half of it from Asia. The prices of electronics, clothing, and other consumer goods tumbled as imports displaced domestic products from store shelves in Europe, Japan, and North America. Low-cost products that would not be viable to trade without container shipping diffused quickly around the world. Declining goods prices in the late 1990s, thanks largely to imports, helped bring three decades of inflation to an end.<sup>14</sup>

Container shipping, it is clear, has helped some cities and countries become part of the new global supply chains, while leaving others to the side. It has assisted the rapid economic growth of Korea while offering precious little to Paraguay. Yet the trade patterns that containerization has helped to create are not immutable. In the 1980s, ship lines' commitments assured the success of several late entrants to containerization, such as Busan, in Korea; Charleston, South Carolina; and Le Havre, in France. In the 1990s, they repeated the trick on a much larger scale in Asia.

By the end of the twentieth century, the container shipping industry was dominated by a handful of alliances of global scope. These companies' megaships may have sailed between two ports, but the cargo they carried was increasingly unlikely to have been produced in or to be destined for the end points of the voyage. By deciding where to employ their vessels, the big ship lines had the power to determine which ports succeeded and which struggled. In some cases, that choice was made for unavoidable reasons; not all ports had the depths required to handle the biggest ships. In other cases,

though, ship lines joined with government officials and private port operators to change comparative advantage. The list of the world's largest containerports around the turn of the century is instructive. Of the twenty ports handling the greatest number of containers in 2003, seven had seen little or no container traffic in 1990, and three of those seven had not even existed before.

These new ports, by and large, were privately managed, and in some cases privately financed. Their creation was a deliberate response to the economics of container shipping, in which keeping the ship moving is what matters most. Only the biggest ports are worth a time-consuming stop. The ports that can load the most containers per hour consume less of a vessel's precious time. Efficient ports, with access to large flows of cargo, will receive large ships and frequent service, with direct sailings to every corner of the world. The massive ports constructed in China, Malaysia, and Thailand during the 1990s were investments in globalization. Factories whose goods use those ports will have the lowest rates and the lowest costs in lost time, saving money on imported inputs and gaining a cost advantage in export markets. Manufacturers in poorer countries, where ports are less busy or less well managed, will find that their high logistics costs make competing in foreign markets a difficult proposition.<sup>15</sup>

That disadvantage goes far beyond the occasional lost export sale. A country cursed with outmoded or badly run ports is a country that faces great obstacles to finding a larger role in the world economy. If Peru were as effective at port management as Australia, the World Bank estimated, that alone would increase its foreign trade by one-quarter. If it cannot be, it will receive the maritime equivalent of branchline service on a single-track railway. The big containerships that link national economies in the global supply chain, carrying nothing but stacks of metal boxes, will pass it by.<sup>16</sup>

Global supply chains were not in anyone's mind in the spring of 1956. Over the next half century, freight transportation developed in ways that could not have been imagined by the dignitaries watching the *Ideal-X* take on those first containers at Port Newark. Per-

TABLE 6  
The World's Largest Containerports: Containers Handled  
(Million 20-Foot Equivalents)

<i>Port</i>	<i>Country</i>	<i>1990</i>	<i>2003</i>
Hong Kong	China	5.1	20.8
Singapore	Singapore	5.21	18.4
Shanghai	China	0.5	11.4
Shenzhen	China	0.0	10.7
Busan	Korea	2.3	10.4
Kaoshung	Taiwan	3.5	8.8
Rotterdam	Netherlands	3.7	7.1
Los Angeles	United States	2.6	6.6
Hamburg	Germany	2.0	6.1
Antwerp	Belgium	1.6	5.4
Dubai	United Arab Emirates	1.1	5.1
Port Klang	Malaysia	0.5	4.8
Long Beach	United States	1.6	4.7
Qingdao	China	0.1	4.2
New York	United States	1.9	4.0
Tanjung Pelepas	Malaysia	0.0	3.5
Tokyo	Japan	1.5	3.3
Bremen/Bremerhaven	Germany	1.2	3.2
Laem Chabang	Thailand	0.1	3.2
Gioia Tauro	Italy	0.0	3.0

*Sources: Containerisation International Yearbook and UN Economic and Social Commission for Asia and the Pacific.*

haps the most remarkable fact about the remarkable history of the box is that time and again, even the most knowledgeable experts misjudged the course of events. The container proved to be such a dynamic force that almost nothing it touched was left unchanged, and those changes often were not as predicted.



Malcom McLean's genius was acknowledged unanimously: almost everyone save the dockworkers' unions thought that putting freight into containers was a brilliant concept. The idea that the container would cause a revolution in shipping, though, seemed more than a little far-fetched. At best, the container was expected to help ships recover a tiny share of the domestic freight business and to benefit Hawaii and Puerto Rico. Truckers ignored it. Railroads shunned it. Even as ship lines talked it up, most of them treated the container as an adjunct to the business they knew, just another one of the many shapes and sizes of cargo that they were accustomed to storing in their holds. Labor was no better informed. When West Coast longshore union leader Harry Bridges negotiated the 1960 contract that allowed unlimited automation of the docks, he drastically underestimated the speed with which containers would alter work on the waterfront, and demanded far too little for his members as a result. When New York longshore leader Teddy Gleason warned in 1959 that the container would eliminate 30 percent of his union's jobs in New York, he was simply wrong: between 1963 and 1976, longshore hours worked in New York City fell by three-quarters.

The economics of container shipping were equally treacherous for ship operators themselves. Many ship lines sacrificed the potential advantages of containerization by ordering vessels that carried containers along with other types of cargo or even passengers. Others guessed wrong about how big their ships or their containers should be. McLean himself went badly astray several times: he ordered fuel-guzzling SL-7s just ahead of the 1973 oil shock, built the sluggish but fuel-efficient Econships just as fuel prices plummeted, and sailed the Econships on a round-the-world route that left some legs heavily booked but others operating well below capacity. The "experts" who deemed container shipping uncompetitive on long routes, such as those across the Pacific, were proven to be wildly off course, and Asia's containerports, filled with boxes destined for North America and Europe, soon became the largest in the world.

Haste, contrary to what many in the shipping industry had assumed, was not a prerequisite for survival in the container era. Mat-

son, previously active only in U.S. domestic trades, raced to become the first line to carry containers across the Pacific in the belief that an early start would assure it loyal customers; as it learned when other companies rudely barged into the business, customer loyalty counted for little. Moore-McCormack may have been the first line to carry containers across the Atlantic, but it could not turn that head start into a viable business. Nor did Grace Line's role as the first container carrier to South America make it a survivor.

The companies that emerged as the world's largest containership operators in the early twenty-first century were relative latecomers to the game. A. P. Møller's Maersk Line built its first containership only in 1973, seventeen years after the *Ideal-X* and seven years after container shipping came to the North Atlantic. Mediterranean Shipping Company, based in Switzerland, did not even exist until 1970, and Evergreen Marine was founded only in 1968. These companies arrived with financial and managerial skills foreign to many of the carriers they replaced, skills appropriate to an industry in which raising capital and managing information systems were far more important than maritime knowledge. They operated without the legacy of government subsidies and directives that had crippled many of their predecessors by forcing them to buy ships built in their home countries or to sail routes determined by regulators. In an industry that almost everywhere wrapped itself in nationalist pride, the long-term survivors were profoundly international. Maersk's headquarters were in Denmark, but by 2005 it had gained control of more than five hundred containerships and one-sixth of the world market by absorbing companies as diverse as Britain's Overseas Containers Ltd., South African Marine, the Dutch shipping giant Nedlloyd, and Malcom McLean's old company, Sea-Land Service.

If the market repeatedly misjudged the container, so did the state. Governments in New York City and San Francisco ignored the consequences of containerization as they wasted hundreds of millions of dollars reconstructing ports that were outmoded before the concrete was dry. The British government's planning efforts led to the costly creation of new ports; officials never dreamed that a privately owned dock in an out-of-the-way town would turn itself into the

country's largest container terminal overnight. Transportation regulators did little better. Japan's Ministry of Transport thought that it could avert overcapacity and keep Japanese ship lines profitable by forcing them to work together, only to be surprised as ship rates in the Pacific tumbled. Regulators and politicians in America, desperate to preserve a system that sought to protect shipbuilders, ship operators, truckers, and railroads, delayed reforms that could have allowed the container to reduce international shipping costs much earlier. By holding on to policies that supposedly strengthened U.S. shipping with a panoply of subsidies and restrictions meant to favor one interest group or another, they ultimately destroyed the competitiveness of the U.S.-flag fleet.<sup>17</sup>

The huge increase in long-distance trade that came in the container's wake was foreseen by no one. When he studied the role of freight in the New York region in the late 1950s, Harvard economist Benjamin Chinitz predicted that containerization would favor metropolitan New York's industrial base by letting the region's factories ship to the South more cheaply than could plants in New England or the Midwest. Apparel, the region's biggest manufacturing sector, would not be affected by changes in transport costs, because it was not "transport-sensitive." The possibility that falling transport costs could decimate much of the U.S. manufacturing base by making it practical to ship almost everything long distances simply did not occur to him. Chinitz was hardly alone in failing to recognize the extent to which lower shipping costs would stimulate trade. Through the 1960s, study after study projected the growth of containerization by assuming that existing import and export trends would continue, with the cargo gradually being shifted into containers. The prospect that the container would permit a worldwide economic restructuring that would vastly increase the flow of trade was not taken seriously.<sup>18</sup>

"The market" got many things wrong when it came to the container, and so did "the state." Both private-sector and public-sector misjudgments slowed the growth of containerization and delayed the economic benefits it would bring. Yet in the end, the logic of shipping freight in containers was so compelling, the cost savings so

enormous, that the container took the world by storm. Half a century after the *Ideal-X*, the equivalent of 300 million 20-foot containers were making their way across the world's oceans each year, with 26 percent of them originating in China alone. Countless more were being shipped cross-border by truck or train.<sup>19</sup>

Containers had become ubiquitous—and in addition to cheap goods, they were bringing a new set of social problems. Stacks of abandoned containers, too beaten up to use, too expensive to repair, or simply unneeded, littered landscapes around the world. The exhaust of containerships and the trucks and trains serving them had become a massive environmental problem, and the endless growth of traffic in and out of expanding ports was subjecting nearby communities to congestion, noise, and high rates of cancer attributed to diesel emissions; the price tag for a cleanup in Los Angeles and Long Beach alone was estimated to be \$11 billion. The flood of containers had become a major headache for security officials concerned that a single box, loaded with a radioactive “dirty” bomb timed to explode upon arrival in a major port, could contaminate an entire city and throw international commerce into chaos; radiation detectors went up at the gates to many terminals in an effort to keep terrorist containers from being loaded aboard ships. The use of containers outfitted with mattresses and toilets to smuggle immigrants had become routine, with immigration inspectors unable to detect more than a tiny share of containers with human cargo among the hundreds of thousands of boxes filled with legitimate goods.<sup>20</sup>

None of these problems, serious as they were, posed the most remote threat to the growth of container shipping. Containers themselves kept getting larger, with 48-foot and even 53-foot boxes allowing trucks to haul more freight on each trip. The world's fleet expanded steadily, with the capacity of pure containerships rising 10 percent per year from 2001 through 2005. And ships themselves reached unprecedented size. Dozens of vessels able to carry 4,000 40-foot containers had joined the world's fleet by 2006, and even larger ones were on order.

Where vessel size had once been limited by the locks in the Panama Canal, containerships had grown so large that twenty-first-cen-

tury naval architects were constrained by the Straits of Malacca, the busy shipping lane between Malaysia and Indonesia. If a container-ship ever reaches Malacca-Max, the maximum size for a vessel able to pass through the straits, it will be a quarter mile long and 190 feet wide, with its bottom some 65 feet below the waterline. If it should sink, it will take nearly \$1 billion of cargo with it. Its capacity will be 18,000 TEUs, or 9,000 standard 40-foot containers, enough to fill a 68-mile line of trucks each time it arrives in port. Where it will call is a serious question, because few ports anywhere are deep enough to accommodate it. The answer may well be brand-new ports built in deep water offshore, with Malacca-Max ships linking offshore platforms and smaller vessels shuttling containers to land. If they ever come about, these enormously costly ships and ports will create yet more economies of scale, making it still cheaper and easier to move goods around the globe.<sup>21</sup>



*Effects of Surface Freight Deregulation* (Washington, DC, 1990), p. 41, estimate the total saving from deregulation at \$20 billion in 1988 dollars, with the loss to railroad and trucking workers estimated at \$3 billion.

39. Gallamore, “Regulation and Innovation, p. 516; John F. Strauss, Jr., *The Burlington Northern: An Operational Chronology, 1970–1995*, chap. 6, available online at [www.fobnr.org/bnstore/ch6.htm](http://www.fobnr.org/bnstore/ch6.htm); Kuby and Reid, “Technological Change,” p. 282. Paul Stephen Dempsey, “The Law of Intermodal Transportation: What It Was, What It Is, What It Should Be,” *Transportation Law Journal* 27, no. 3 (2000), looks at the history of regulations governing intermodal freight.

40. Robert C. Waters, “The Military Sealift Command versus the U.S. Flag Liner Operators,” *Transportation Journal* 28, no. 4 (1989): 30–31.

41. *Lloyd’s Shipping Economist*, various issues; Hans J. Peters, “The Commercial Aspects of Freight Transport: Ocean Transport: Freight Rates and Tariffs,” World Bank *Infrastructure Notes*, January 1991; author’s interview with William Hubbard.

## Chapter 14

### Just in Time

1. Paul Lukas, “Mattel: Toy Story,” *Fortune Small Business*, April 18, 2003; Holiday Dmitri, “Barbie’s Taiwanese Homecoming,” *Reason*, May 2005. For discussion of the toy industry’s supply chains, see Francis Snyder, “Global Economic Networks and Global Legal Pluralism,” European University Institute Working Paper Law No. 99/6, August 1999.

2. This description of just-in-time procedures is taken from G.J.R. Linge, “Just-in-Time: More or Less Flexible?” *Economic Geography* 67, no. 4 (1991): 316–332.

3. The counts, drawn from approximately a thousand business and management periodicals, are taken from Paul D. Larson and H. Barry Spraggins, “The American Railroad Industry: Twenty Years after Staggers,” *Transportation Quarterly* 52, no. 2 (2000): 37; Robert C. Lieb and Robert A. Miller, “JIT and Corporate Transportation Requirements,” *Transportation Journal* 27, no. 3 (1988): 5–10; author’s interview with Cliff Sayre.

4. According to calculations based on the U.S. National Income and Product Accounts, private nonfarm inventories in 2004 averaged about \$1.65 trillion, or about 13 percent of final sales. Through the early 1980s, the ratio was in the range of 22 to 25 percent. That 9 percentage point reduction measured against 2004 final sales of \$12.2 trillion yields an annual saving approaching \$1.1 trillion. An alternative measurement examines the average length of time goods are held in inventory by retailers, wholesalers, and manufacturers. Analyzed in this way, if inventories had

risen at the same rate as sales since the early 1980s, U.S. department and discount stores would have kept an additional \$30 billion of stock on average during 2000, durable goods manufacturers would have held an additional \$240 billion of inventories, manufacturers of nondurables would have had inventories about \$40 billion higher than the actual number, and wholesale inventories might have been \$30–\$40 billion higher. This method yields a decline in average inventories relative to sales in these sectors of more than \$400 billion. See U.S. Census Bureau, *Monthly Retail Trade Report*, and Hong Chen, Murray Z. Brank, and Owen Q. Wu, “U.S. Retail and Wholesale Inventory Performance from 1981 to 2003,” Working Paper, University of British Columbia, 2005.

5. On earlier forms of globalization, see Kevin H. O’Rourke and Jeffrey G. Williamson, *Globalization and History: The Evolution of a Nineteenth-Century Atlantic Economy* (Cambridge, MA, 1999), and O’Rourke and Williamson, “When Did Globalization Begin?” Working Paper 7632, NBER, April 2000.

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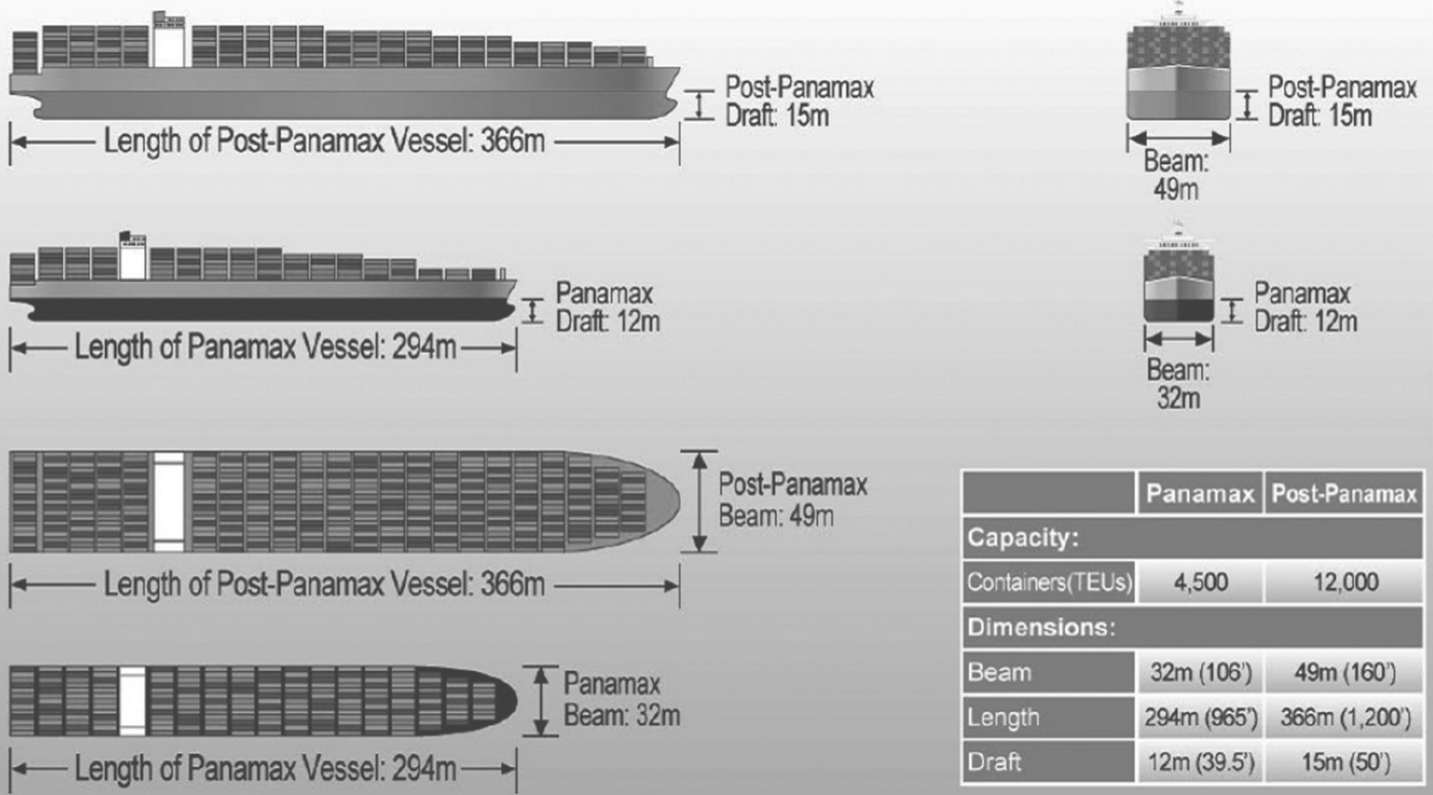
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## Comparison between Panamax and Post-Panamax Container Vessels



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