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Introduction

Richard B. Freeman and Kathryn L. Shaw

Management practices toward workers differ substantially across countries and among the firms and establishments within countries. Some firms use work teams and employee involvement committees, have extensive personnel policies, and compensate workers in part through group incentives that link pay to company or workplace performance. Others operate under traditional hierarchical arrangements and pay hourly wages independent of performance. Practices differ by country within the same multinational firm in part because countries have different labor laws and institutions. Practices differ in the same country because firms choose different personnel management strategies and because within the same firm, management and labor implement policies differently in different worksites.

Labor productivity also varies widely among countries and among firms and establishments within countries. Some productivity differences reflect the differing skill of workers and differences in the machines and technology with which they work. Productivity also differs because managerial practices and worker responses to practices differ, with consequences for how workers do their jobs. At the industry level, productivity growth often takes the form of the entry of firms or establishments that have better practices and the exit of firms whose labor practices and productivity are worse than average, though this market culling still leaves a large dispersion in both practices and productivity.

In the 1990s to 2000s, globalization and the extension of information technologies associated with the computer and Internet reshaped many mana-

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gerial practices. Operating in different countries, multinational firms have had to adjust business practices to different legal regimes. Domestic firms have also had to reexamine their managerial practices in light of what foreign competitors do. Equally important, the new information technologies associated with the computer and Internet changed best practice methods of organizing work, paying compensation, and operating a business. Teamwork and group problem-solving, group incentive pay, and extensive modes of selecting workers became more prevalent along with lean manufacturing, better quality control, and better scheduling methods. Productivity grew rapidly in sectors that use information technology, resolving the Solow paradox that one observed computers everywhere but in the productivity statistics. There is also some evidence, but more conjecture, that the reason it took a long time before computerization impacted productivity was that organizations had to change business practices to make best use of the new technologies, which is more difficult and time-consuming than putting computers at work stations.

Taking the shocks of globalization and information technology and national labor relations regulations as exogenous, this book examines four questions that lie at the heart of ongoing debate about how firms contribute to economic growth and the degree to which national customs or regulations impede or spur growth-augmenting improvements in productivity.

1. How great is the *cross-country* variation of labor practices and productivity across firms and within a given multinational operating in the same sector across countries?
2. Do *country-specific rules and regulations* significantly affect the adoption or success of innovative management practices and the rate of productivity advance?
3. What slows the spread of best practices across firms and thus maintains the wide variation in productivity found in many sectors and firms?
4. Do the new labor practices associated with technological and managerial innovations benefit the workers directly affected by the changes or are firms (and ultimately consumers) the sole beneficiaries of improved productivity?

Many researchers examine these types of questions by relating measures of economic outcomes using industry-level or macroeconomic data to cross-country variation in labor regulations, investments in computer technology or other capital, and investments in labor skills. We take a more microeconomics approach, analyzing what goes on inside firms engaged in similar lines of business or sectors across countries when they face similar exogenous changes in technology or market conditions. Our primary focus is on establishments within multinational firms, because this controls for firm-based differences in technology or corporate strategy. But we also examine practices and productivity in sectors where many of the firms are domestic.

The first part of the book (chapters 1 through 3) report on studies of the practices and productivity across firms that operate in broadly similar markets and thus should face similar technological and market constraints and problems while operating in the United States and other advanced countries. The second part of the book (chapters 4 through 8) examines practices and productivity within multinational firms when they operate in different countries.

Methods: Pin Factory or Insider Econometrics

All of the studies use a methodological approach that amalgamates econometric analysis of data on companies or sectors with the interviews and traditional business school or labor relations qualitative case studies. By combining the depth of knowledge about a particular firm or market from plant visits, interviews, and discussions with participants and statistical estimates of models of economic behavior from quantitative data, we hope to get closer to understanding business practices and their impact on productivity than we would get from either approach done separately. We call this combination of qualitative case studies and quantitative analysis *pin factory* or *insider econometrics.* The term pin factory comes from Adam Smith's famous example of the division of labor. The term insider econometrics refers to the use of information that is available only to persons with detailed knowledge of the firm or sector.

The first step in a pin factory/insider econometrics study calls for the researcher to interview managers, workers, and others at the relevant firm or firms to learn about the mode of production and the business practices and issues that face the firm. This gives the analyst a different perspective than he or she would have gotten from estimating production or cost functions or modeling firm behavior with little attention to actual processes or practices. It often leads the researchers to focus on different research questions or to choose a different research design than they envisaged before their pin factory visit. If, for example, the researcher learns that the big problem facing a firm is getting workers on one shift to work cooperatively with those on another shift, that could readily become the subject of study. Alternatively, if management reports that it changed compensation policies for some group of workers in a way that might readily provide the researcher with the pseudo-experimental variation from which to draw inferences about the impact of compensation on productivity, the researcher might concentrate on that issue (and so on).

The second step in a pin factory/insider econometrics study is to gather data from the firm or sector and to then test models or hypotheses of the factors that generate the behavior reflected in the data. In our volume, some of the insider econometrics data come from firm records (chapters 3, 5, 6, and 8); and some come from researcher-designed surveys of managers or work-

ers (chapters 1, 2, 4, and 7). This step requires that top management open some of its books to the researcher and/or encourage lower level managers and workers to cooperate with the specially designed survey. The researcher usually agrees to some form of confidentiality regarding the use of data and identification of the firm in the study. In this volume, we do not provide the name of any of the firms that cooperated with our research team, but we are highly thankful to those firms. Without them we would have no study.

The third step in a pin factory/insider econometrics study is to formulate and estimate a model focused on key issues facing the firm/sector that illuminates their underlying cause or effect. This is standard econometric investigation, which has become increasingly sophisticated due to the availability of high-powered statistical programs and modes of data manipulation. What is nonstandard is the unique firm or establishment based data that reflects the information-gathering process in the firm and the issues facing it. Different researchers may use somewhat different techniques from the statistical tool-bag to analyze the data but the results rarely depend on the technique. It is the data itself—the variables measured and the quality of the measurements—that matters.

The principle scientific problem in our analyses (and in most others in economics and business) is that the data are generated by the decisions of management and workers rather than by a random assignment experiment designed to test, say, the impact of a particular work practice or new technology on the performance of the firm. We observe how an establishment fares with the business practices or technology that it chooses, not how it would have fared if it had chosen other practices. This does not rule out causal interpretations of observed patterns, but it makes them problematic.

In standard applied economics researchers usually conclude their work with their estimated model and interpretation of the estimated parameters. Ideally, they test for the robustness of results under different model specifications and consider alternative interpretations of the patterns in the data. Insider econometrics goes a step further by asking the informants in the firm/sector to assess the findings in light of the informants' knowledge. This step is critical because it provides nonstatistical independent verification or rejection of the story/conclusion of the analysis. When an informants' interpretation differs from that of the researcher, the researcher will try to close the gap by modifying the model or providing additional tests. But researchers need not take the views of the informants as gospel; sometimes the person closest to a phenomenon misses the critical factors that underlie it. By viewing the firm from outside and applying a broad economic perspective to issues, the economist may be closer to the truth than the informant. It is the tension between the qualitative and the quantitative that makes these types of studies challenging and stimulating.

There is one broad problem with the insider econometrics studies in this book and elsewhere that merits attention even in this brief introduction. This

is the question of assessing how far, if at all, we can generalize results from a nonrepresentative sample of firms to the broader universe of firms. There is no gainsaying the nonrepresentative nature of virtually all case studies, whether they use econometric analysis or not. Some firms are open to having researchers study them. Others are not. Simply because one analyzes a nonrepresentative entity does not mean that the findings are limited to that entity. If the results of many studies from nonrepresentative samples with different sampling designs are similar, it seems reasonable to generalize beyond the particular companies or sectors covered. If the findings relate to basic economic behavior (for instance, buying less when prices or wages rise), it seems reasonable to generalize broadly just as psychologists generalize findings from experiments based on volunteers to all people. But when, as occurs between some chapters in this book, results differ across sectors or firms, we cannot make any broad generalization. Some results seem to reflect idiosyncratic differences among these units.

Data Sets

Figure 1 provides a capsule summary of the data sets used in each chapter. The range of data sets is remarkable in its diversity. None of the studies uses "standard" statistical surveys as its main source of information. One chapter surveys 29,000 employees in a single multinational. Another asked management in 267 valve-making plants about the computer numerically controlled machines used in the business and about human resource practices associated with the technology. Another obtained data by interviewing managers in 732 manufacturing firms in four countries. Another chapter used internal firm data on inputs and outputs of hundreds of outlets of a fast food chain. Another obtained records on the hourly performance of individual workers from electricity generating firms, and so on.

Variety in the type of data studied is characteristic of pin factory/insider econometric analyses, in which the variables go far beyond those in the data sets that microeconomists investigate regularly (e.g., the Census of Population, labor force surveys, and surveys or censuses of business establishments), and diverge even more from the aggregate time series data that macroeconomists analyze. The diversity of data reflects the individuality of firms/sectors, each with its own history, management use of information technology for measuring performance, and firm or industry-specific practices and issues, and the microeconomic questions on which the researchers focused.

Summary of Findings

Taken together, the studies in the book illuminate the four questions that motivated our research. Each study reports on the issues that it addresses,

Table I.1 Data Sets and Major Findings of Studies in this volume

Chapter	Data sets used in chapter
Studies Across Firms in Different Countries	
1. Work-Life Balance, Management Practices and Productivity (Bloom, Kretschmer, Van Reenen)	Own telephone survey of managers of 732 medium-sized manufacturing firms in the United States, France, Germany, and the United Kingdom; some are multinationals.
2. International Differences in the Adoption and Impact of New Information Technologies and New HR Practices: The Valve-Making Industry in the United States and United Kingdom (Shaw, Bartel, Ichniowski, Correa)	Own survey of 267 valve-making plants in the United States and United Kingdom
3. Personnel, Information Technology and the Productivity of Electricity Generation (Bushnell, Wolfram)	Company data on individual productivity of workers at five electricity generating facilities in the United States, with case material from the United Kingdom and Spain.
Studies Within the Multinational	
4. Labor Practices, Compensation, and Establishment Performance in a Single Large Multinational (Blasi, Freeman, Kruse)	Own survey of 29,000 employees within a large manufacturing and service company with establishments in the United States and other countries.
5. Within-firm Cross-country Labor Productivity Differences: A Case Study (Lafontaine, Sivadasan)	Company data on food outlets for 27 countries (including all of Europe) for 2002 and 2003.
6. International Productivity Differences in a Pharmaceutical Firm (Eriksson, Westergaard-Nielson)	Company data on productivity of pharmaceutical plants in the United States and Europe within one company.
7. Measuring the Productivity of Software Development in a Globally Distributed Company (Levenson)	Own survey of 200 developers as well as, site visits, and interviews, in four international locations.
8. Comparing U.S. and European Operations of an Auto Parts Company (Helper and Kleiner)	Data on productivity of five auto parts production plants in the United States and the United Kingdom within one company.

the particulars of the data analyzed, the methodology used, and the findings. Each also gives case study information about the firm or group of firms studied that will hopefully give the reader a memorable picture of the human resource issues and policies facing management in different settings and their link to productivity. Some of the studies explain the detailed technology in a given sector, such as how valve manufacturers use flexible manufacturing systems to coordinate computer numerically controlled machines to produce valves or how operators affect the efficiency of generation of electricity in utilities by turning on or off blowers to remove soot from machines. These studies use industry-specific measures, such as set-up time or the ratio of million British thermal units over mega watt hours of electricity pro-

duced, to measure productivity rather than generic value-added or sales per worker.

As an indication of what the reader will find in the chapters, we summarize next their main findings organized according to our four motivating questions.

1. How great is the ***cross-country*** *variation of labor practices and productivity across firms in the same sector or within a given multinational engaged in a similar business across countries?* As a broad generalization, the variation is great—certainly greater than most economists would expect on the basis of the standard theory of production that focuses on representative firms. Productivity differences across similar plants are substantial, due presumably to differences in management practices or the influences of historical (or possibly outdated) practices that persist over time. This appears to be true across firms in the same sector across countries, as in small auto parts production (Helper and Kleiner) and valve manufacturing (Bartel, Ichniowski, Shaw, and Correa); across firms in the same manufacturing industry (Bloom, Kretschmer, and Van Reenen); and across establishments in the same firm in manufacturing (Blasi, Freeman, and Kruse), and across countries in the same multinational retailer (Lafontaine and Sivadasan).

Even when multinational firms make similar products in similar plants across countries, differences in capital or in the quality of the managers produce different productivity outcomes in many situations. For instance, in auto parts U.S. plants have higher productivity compared to UK plants, which Helper and Kleiner attribute to differences in the quality of the plants' capital and the quality of the management. In electricity generation, Bushnell and Wolfram find considerable performance differences among workers in the same plants in the United States and report responses to incentive pay in the United Kingdom that seemingly diverge from that in the United States.

But not every study finds sizable variation in productivity. In some sectors multinationals operating with the same technology appear to compress productivity differences. Eriksson and Westergaard-Nielson report similar productivity in pharmaceutical establishments that produce the same products in the United States and Denmark. Human resource practices and labor market conditions differ between the United States and Danish plants, but management has found ways to work around these differences to keep operations in both countries near the productivity frontier. Similarly, Levenson finds that productivity does not vary substantially across different national sites of the same multinational software development firm. This firm maintains comparable productivity as it transfers some operations to international locations, some of which have lower labor costs than the United States. It incurs higher communications costs due to its setting up teams across countries but uses modern information and communication technology to maintain team effectiveness.

In sum, we find large variation among establishments across countries, which some multinationals seem to reduce or even virtually eliminate within their own business. The studies that examine data over time find trends toward improved productivity, be it through better information technologies, or capital, or improved labor practices.

2. How much do ***country-specific rules and regulations*** *affect the adoption or success of innovative management practices and/or productivity?* Analyses of why productivity differs among advanced countries that have access to similar technologies often stress the importance of national labor relations practices. In the 1980s, many American analysts and businesses looked longingly at Japan's job rotation and lifetime employment practices or at Germany's apprenticeship programs or the cooperative labor-management relations in the Nordic countries. In the 1990s to 2000, many analysts blamed the slower growth of productivity in advanced Europe than in the United States on Europe's greater reliance on labor regulations, collective bargaining, and institutions to determine labor market outcomes, compared to the United States's reliance on market-determination of outcomes.

Our analyses find that country-specific rules and regulations affect the personnel or human resource policies of firms but that these policies have relatively modest effects on productivity at the level of the firm or establishment. With respect to the impact of national policies on firm behavior, Bloom, Kretschmer, and Van Reenen find that while U.S. subsidiaries in Europe adopt the general management practices of their U.S. parent firm, they adopt the work-life balance practices in the country in which they operate. They offer work-life balance practices, such as part-time work, job-sharing, childcare, or work from home in EU countries but do so without reducing productivity. Looking within a single multinational Blasi, Freeman, and Kruse find large differences across countries in the work practices and attitudes of employees on such issues as their willingness to work hard for the company, willingness to monitor the behavior of their peers, and willingness to innovate on the job. But they also report that when the firm puts in comparable incentive practices in its establishments across countries that workers in different countries respond in qualitatively similar ways.

In pharmaceuticals the same multinational operates its U.S. plant non-union with a workforce that has considerable turnover while operating its Danish plant with a unionized workforce that has little turnover. Even with these differences, however, the plants have similar productivity levels and management has the same goal for managing labor: to increase its control and reduce worker (or team) empowerment. At the time of the Eriksson and Westergaard-Nielson case study, management had abolished work teams in the United States and was seeking to do so in Denmark. The differences in institutions seemingly affected the mode and speed by which management changed organizational practices more than the final outcomes. The chapters on valves (Shaw, Bartel, Ichniowski, and Correa) and on auto parts (Helper

and Kleiner) also conclude that labor regulations had little impact on productivity. Blasi, Freeman, and Kruse report little relation between workers' attitudes and broad aggregate indices of country institutions. What matters in the multinational they study are labor policies and practices at the shop floor. Still, not every study found labor regulations to be largely irrelevant to productivity type outcomes. LaFontaine and Sividasan report that in the international retail food chain they studied how regulations covering hiring and firing costs across these countries affected outcomes. In countries with high firing and hiring costs, firms hired fewer workers, which raised labor productivity while lowering output by about 2 to 3 percent.

In sum, with one exception our studies find that the effects of labor market institutions on productivity are too small or unquantifiable to explain much of the difference in productivity in the data and accordingly attribute performance differences across plants to other factors. Managers and workers seem to find ways to minimize the potential adverse effects of regulatory or institutional constraints and thus achieve levels of productivity that are roughly independent of the labor codes.

3. What slows the spread of best labor practices and prevents management from reducing the wide variation in productivity observed in many sectors and firms? This is the most difficult of our four questions. The case investigations found that in some sectors managers were continually making changes in labor practices independent of the regulatory environment. They were either searching for best practice modes of operating or changing practices as economic conditions changed. In the valve industry, firms made huge progress between the 1980s and the 2000s in adopting new information technologies and human resource practices. These information technologies and the accompanying changes in the mode of work made these firms more productive. Still, there was considerable variation in productivity and in rates of adoption among firms and establishments. Even within the same firm some plants did not copy best practices even when it seemed fairly easy to do so. In electricity generating plants, management believed that individual operators could substantially affect plant efficiency and profits but it took the U.S. Environmental Protection Agency (EPA) regulations for them to produce the data that verified these claims (which limited the quantitative analysis in this chapter to the United States). Still, the firms did not use this data to target programs to improve the performance of individual operators and reduce the variance of performance across individuals. One firm developed an in-house computer program to guide operators that seemed to bring the less efficient up to speed, but others did not do this. The experience of the auto parts industry confirms the difficulty of transferring knowledge across plants.

In sum, in some sectors productivity varies widely among establishments in comparable production environments. Such factors as when the plant was built or the technologies in place or the idiosyncratic impact of having

different managers or workers with different talents or objectives matters greatly in the speed with which best practices spread among plants in a given firm and across firms. In many cases, management does not analyze the outcomes from changes in practices nor have strong policies to bring laggard worksites or workers up to speed. Firms seem to leave rents on the table as long as they are not facing a financial crisis, either because they satisfice rather than maximize or because the transition costs of change are far greater than we would anticipate.

The absence in this volume of any study that uses random assignment experiments to study the introduction of practices or technology limits our ability to say more about what factors impede the spread of best practice techniques. We observe that learning is not sufficient to make firms or establishments identical, but we do not observe what these plants would have been like if they learned nothing at all from their counterpart. Absent experiments with randomly assigned practices, we can only conclude either that these establishments have not learned enough or that the low productivity workplaces had high unmeasured adoption costs. It is remarkable that U.S. states and the federal government often conduct random assignment experiments to determine what works or does not in welfare policies before changing those policies, while firms regularly alter labor practices that can affect bottom lines without any such evaluations.

4. Do the new labor practices associated with technological and managerial innovations benefit the workers directly affected by the changes or are firms (and ultimately consumers) the sole beneficiaries of improved productivity? Productivity change at a workplace can improve or harm the economic well-being of employees at that site. Technological change that raises demand for labor or skills should benefit workers while change that displaces labor or reduces or obsolesces skills is likely to harm some workers in the short or medium run, even though it should benefit workers as a whole in the long run. Changes in human resource practices that raise productivity can be beneficial or harmful to workers depending on how it affects their autonomy and working conditions.

The studies in this volume suggest that, with some exception, the technological and managerial changes in the period covered benefited workers as well as firms. Firms with good management practices in the Bloom, Kretschmer, and Van Reenan sample raised productivity more than others and were more likely to have work-life balance programs that benefit workers. By themselves, work-life balance programs had negligible effects on productivity, so it is their coincidence with better management that induces a positive association between those practices that benefit workers and productivity. In the multinational in the Blasi, Freeman, and Kruse study, workers paid by "shared capitalist" modes of compensation in the form of stock ownership or profit sharing or gain-sharing had better outcomes for workers than workers covered by standard modes of pay. The shared capitalist work-

ers report greater work effort, employee cooperation, and willingness to act to reduce shirking by fellow employees, and lower the likelihood of leaving the firm—which should raise productivity and benefit the firm. But they also report better labor-management relationships, higher job satisfaction, greater loyalty and trust with the firm, and greater job security—all of which should benefit the workers.

In the valve industry, the adoption of new computer-based information technology increased the technical and problem-solving skill requirements of workers in the United States and United Kingdom (Bartel, Ichniowski, Shaw, and Correa). The use of teams, training programs, and bonus/incentive plans increased substantially along with the new technologies. Since employment in the valve industry fell, a full accounting of the impact of technology on the workforce in the sector requires some assessment of what happened to workers who might have had employment under the older technology, but at the least those employed seemed to have better jobs under the new technology. Still, on this point as on others, not all of the studies in the book found similar patterns. In the pharmaceutical firm examined by Eriksson and Westergaard-Neilson, management had eliminated teams in the U.S. establishment and was seeking greater managerial control over decisions in Denmark as well, which was probably not in the interest of workers.

Conclusion

International Differences in the Business Practices and Productivity of Firms provides considerable insight and information into the way business practices vary across countries, firms, establishments, and among workers within establishments, but does not give definitive answers to the four questions around which our work focused. If there is a single conclusion to the volume, it is that there is a lot of heterogeneity or variation in practices and performance, and a lot of variation in the amount of variation among sectors that seems to require another level of analysis to explain. For the most part, our studies reject the simple story that differences in organizational practices and performance are largely caused by the legal restrictions. They illuminate the extent and nature of variation in practices and productivity but do not pin down the reasons for those differences nor offer ways to bring lower-productivity firms or worksites up to speed. We can imagine experiments that would identify barriers to the rapid spread of best practices and ways to reduce those barriers. In the not so distant future perhaps some firm(s) will take up the challenge of conducting such an experiment, not for the sake of academic research, important though that is, but to gain a competitive advantage in its business practices.