

**The Microeconometrics of Human-Resource
Management: Multinational Studies
of Firm Practices**

Foreword

Although economists have conducted numerous empirical studies of labor supply using individual data, tests of labor demand models, or more importantly tests of human resource management models, using firm-level data have been quite rare. The paucity of such studies does not reflect a general disinterest in the subject since theoretical models of contracts designed to motivate the work force, efficiency wages, profit sharing and collective bargaining abound. Rather, the data necessary to conduct the tests of such theories have been, until recently, difficult to obtain. Firm and establishment samples have been used for many years to study financial questions but these samples, often based upon accounting reports associated with securities regulations, have not contained the employee composition and compensation data necessary for the study of the personnel management issues that lie at the heart of modern theories of the economics of organizations. Although neoclassical labor demand models have been estimated using longitudinal firm data, even these studies had to infer most of the interesting dynamics because the researchers did not have the direct measures of hiring and separations that are the basic data elements in such analyses (see, for example, Card 1986 for a classic example, or Hamermesh 1989 where such data were available for a single firm). Similarly, tests of contract theory incentive mechanisms depend critically upon the specification of the participation constraint, which requires a measure of the external salary summarizing the worker's opportunities on the labor market. In many cases information about the firm's employment and payroll costs must be supplemented with additional data about the characteristics of the individual workers. Until recently, such data simply were not available in any country. Consequently, tests of such models relied upon aggregate or sectoral wage rates as proxies for the opportunity cost of

time inside the firm (see, for example, Nickell and Wadhvani [1991] and Brown and Ashenfelter [1986]).

Now, in many countries, researchers are gaining access to the fundamental data on businesses and employees required to test directly models of firm behavior. This conference had, thus, two goals. First, we sought to collect studies of the microeconomics of human resource management from many countries. Second, we wanted to collect a primer on the sources of data currently available to researchers around the world to study these firm employment problems just such studies were becoming increasingly common.

The symposium, held the December 7-9, 1994 at the Conference Center in the Ministry of Economics and Finance, had many useful outcomes. Among others, we would highlight:

- The ADRES Conference included researchers from North America and Europe. Although empirical labor economics is largely dominated by the former, the conference helped familiarize those researchers with the work being done in Europe.

- Every paper contained a detailed data analysis at the firm or establishment level and the researchers were able to present and discuss the sources, advantages and shortcomings of their data. In general, the American sources were well-known to all present even though the study by Brown and Medoff and the one by Lalonde Marschke and Troske presented results from new American data not previously analyzed. On the other hand, many of the European data sources were not well-known outside of the country of origin.

- The conference was the first to feature a truly international collection of papers analyzing firm-level data to study many of the classic questions in labor economics: labor demand, unions, compensation systems, and the relation between human resource management techniques and firm performance.

- The countries covered in the studies included the United States (4 papers), the United Kingdom (3), Germany (2), The Netherlands (2), Italy (2), Norway (1), Spain (1), Belgium (1), Australia (1) and France (6). Unfortunately, some of these studies are not presented in this conference. The principal reason for this omission was the poor quality of the data for some countries. This was particularly true for the German studies, which were based upon a very small, nonrepresentative sample of firms.

- It is clear from the research presented at the conference that major advances in the quality of longitudinal firm-level data are happening on both sides of the Atlantic.

- Finally, two completely new research programs were present at the conference and included in this volume. The first of these is the study of employment demand using newly created data on actual employment flows (Hamermesh, Hassink, Van Ours; Leonard, Van Audenrode; Dell'Aringa, Lucifora) that extends the long-prevailing practice of inferring these flows from data on the stocks of workers observed at several dates. The second of these is the study of joint employer-employee decisionmaking using information on matched samples of workers and firms (Leonard, Van

Audenrode; Abowd, Allain; Brown, Medoff; Abowd, Kramarz, Moreau; Margolis; Kramarz, Lollivier, Pelé).

1 Studies of Job Flows and Labor Demand

As we discussed above, this conference was the first to include detailed studies of job flows based upon directly measured firm hiring and separation data. Three papers used such data: Hamermesh, Hassink and Van Ours; Leonard and Van Audenrode; and Dell’Arringa and Lucifora (this paper appears in the section on unions). The first of these articles “Job Turnover and Labor Turnover: A Taxonomy of Employment Dynamics” considers employment flows based on a sample of Dutch firms. The authors contrast the creation and destruction of jobs measured using the Davis and Haltiwanger method of comparing stocks observed at two different time periods with the directly measured creation and destruction of jobs as reported by the firms. The conventional Davis-Haltiwanger measures turn out to be quite similar to the directly measured flows (see also Klette and Mathiassen in this number). They also compare the creation and destruction of jobs with the worker flows into and out of the firms. The worker flows are approximately three times the job flows (results similar to those found by Lagarde, Maurin and Torelli [1995] and Abowd, Corbel and Kramarz [1995]). In addition, worker and job flows are only weakly correlated. Finally, the Dutch data show that most firms are hiring even when they are destroying jobs and that many firms have employer-initiated separations even when they are creating jobs. The article “Worker’s Limited Liability, Turnover and Employment Contracts” by Leonard and Van Audenrode also considers the movements of workers. The authors estimate a structural efficiency wage model using matched employer/employee data from Belgium. In their model the firms vary the return to seniority (slope) and the initial salary (intercept). Firms with larger slopes have few quits and layoffs. The “limited liability” of the workers—workers are not liable for the consequences of their shirking—induces suboptimal effort that must be compensated by the slope and intercept. The authors find that the variability in compensation in Belgium is comparable to that of the United States and does not appear to be related either to rent-splitting or omitted variables. Most of the Belgian worker mobility occurs for persons who are beginning their careers and, furthermore, firms with higher returns to seniority (larger slopes) have lower voluntary turnover and layoffs.

The next two articles use longitudinal firm data to study carefully two classic problems in labor demand. Dormont introduces firm-level heterogeneity into a traditional dynamic labor demand model. The coefficients of the firm’s production process are modeled as correlated random effects that depend upon observable characteristics of the firm and a random firm effect. Using a panel of 810 French industrial firms, Dormont estimates the model by the generalized method of moments. Heterogeneity that enters the dynamic factor demands is very important. A greater share of skilled worker in labor demand is associated with slower

speeds of adjustment and with less sensitivity of labor demand to changes in the employment costs. Because of this heterogeneity in firm responses, a significant part of the labor market has slower rates of adjustment. Dormont also shows that in spite of the significant heterogeneity in the firm-level coefficients, the aggregation biases are not very important. The condition for lack of aggregation bias—the absence of correlation between the random coefficients and observable characteristics of the firm—is fulfilled. Klette and Mathiassen study the "Creation of Jobs, Destruction of Jobs and Entry-Exit of Establishments in Norwegian Establishments" using longitudinal establishment data. The authors make calculations similar to those proposed in Davis and Haltiwanger [1992] in order to determine the extent to which the creation and destruction of Norwegian jobs is due to the activities of continuing establishments or to the birth and death of establishments. Much to their surprise the authors find that the Norwegian results are very similar to the original Davis-Haltiwanger results for the United States. The creation and destruction of jobs, particularly those with long expected durations, is due primarily to the birth and death of establishments. In contrast to the United States, however, the Norwegians find that the creation of jobs is a small-establishment phenomenon. Using a model of firm selection (Jovanovic 1982) in which the entrepreneurs learn about their firm-specific productivity, the authors attempt to account for the features of the Norwegian job flow data.

2 Unions

The article by Dell'Aringa and Lucifora "Labor Turnover and Unionism in Italy" could have easily been featured in the last section. It concerns the relation between entry and exit of workers and the extent of unionism in the firm. Using a sample of 2,526 Italian establishments in the mechanical and metal industries in 1990, the authors calculate measures of employment mobility similar to those in the Hamermesh, Hassink and Van Ours paper. Employee initiated quits are distinguished from employer-initiated layoffs. After describing the unique features of the Italian labor market institutions, the authors show that, holding current wages constant (higher current wages are known to reduce labor separation rates), the existence of a firm-level union also reduces the rate of turnover. In addition, the existence of formal training programs is also associated with lower employment turnover. Finally, and not surprisingly, larger establishments have lower separation rates. Lalonde, Marschke and Troske use the longitudinal American manufacturing establishment data called the "Longitudinal Research Datafile (LRD)" that was created by the Census Bureau. Because American establishments are not unionized when they are created, but can become union establishments following a representation election in which the workers choose whether or not to authorize a union to bargain for them, the authors merge data on the occurrence and outcome of these "representation elections" with the basic establishment data recorded in the LRD. The authors have, therefore, longitudinal data on the establishments and on

the union status of the work force at the establishment and their analysis compares firms before and after successful representation elections to firms in which the union lost the election. The results confirm the traditional American view of unions and management as essentially combative. When a union succeeds in organizing an establishment, the employment at the establishment is reduced as compared to other nonunion establishments, an effect that lasts up to nine years after the representation election. This reduction in employment is also associated with a reduction in output at the unionized establishments. In addition, the white collar share of employment rises and labor productivity falls in the unionized establishments. Finally, the authors find that wages in unionized establishments do not rise following the representation election, relative to the wages of nonunion employees. This finding is particularly surprising given the large American literature on union wage effects. The final article in this section concerns unionism in Spain. In their article "Wage Drift in Collective Bargaining at the firm Level: Evidence from Spain" Palenzuela and Jimeno discuss a set of institutions that differ markedly from those in the two preceding articles, but which are quite similar to those in France. After discussing the basics of the Spanish institutions, in which firm level accords supplement general industry agreements, the authors test a model of negotiation with wage drift at the firm level using longitudinal Spanish data derived from the Bank of Spain's financial data and a registry of all Spanish collective bargaining agreements. Unfortunately, the authors' measure of negotiation outcomes is only available for a single year [1990]. Nevertheless, they find that there is about a 5% wage drift at the firm level associated with negotiations of firm-specific agreements. The magnitude of the wage drift is directly related to the quasi-rents in the firm (see also Abowd and Allain in the next section for a similar analysis). Other findings include a negative association between firm size and temporary employment and a negative association between labor productivity and firm-level negotiations. They explain this last finding by the difficulty of creating effort-inducing incentives in the firms with collectively negotiated wage pacts. They conclude that firm level wage negotiation affect both the division of the quasi-rent and the structure of incentives.

3 Human Resource Management Policies and Product Market Conditions

All the authors in this section try to relate certain human resource management outcomes to conditions in the product markets of the firms. Abowd and Allain and Blanchflower and Machin study the relation between wages and product market competition. Meghir, Ryan and Van Reenen analyze the effect of technical innovations on the dynamic adjustment of employment. Brown and Medoff try to relate the compensation policy of the firm to its age while Abowd, Kramarz and Moreau relate the compensation policy to product quality.

Abowd and Allain build on the work of Abowd, Kramarz and Margolis [1994] who studied the determinants of compensation for 1,000,000 French workers who were followed from employer to employer over a 12 year period. Abowd et al. were thus able to estimate an external wage rate (market value of time) for each person on their sample. By aggregating over individuals in the same firm, this measure of an individual's external wage rate can be used to create an estimate of the average external wage rate for workers employed by the firm and a direct measure of the quasi-rents per worker. Abowd and Allain use this estimated external salary as the threat point in a Nash bargaining model of the quasi-rent division within the French firms. Using a sample of 14,200 French firms (from the Abowd et al. analysis), the authors add data on the structure of the French product market (market shares) and the international prices of the goods traded. The quasi-rents per worker are not strongly related to the structure of the French product market but they are strongly related to the prices on the international market and to the structure of the internal work force. They estimate that the bargaining power of the workers is about 0.4 (implying that 40% of the quasi-rent per worker goes to the workers). This value is slightly larger than those found for other industrialized countries but may be reasonable for an economy in which the vast majority of jobs are covered by industry-level collective bargaining agreements or firm level accords. Blanchflower and Machin examine the relation between productivity and compensation policy. Their data are completely different, however. They use two related surveys of industrial relations practices in the United Kingdom and Australia both conducted at the end of the 1980s. Since the two surveys were designed to have similar questions and structure, the authors use the responses to study the similarities and differences between the two countries in the relation between product market competition and worker productivity. Distinguishing between manufacturing and service firms, that find no relation between product market competition and productivity in the UK and only a small positive effect in Australia. In addition, wages are only weakly correlated with their product market variables and even this correlation doesn't hold for all skill levels of employee. In their contribution, Meghir, Ryan and Van Reenen look at a similar question. They try to estimate the effect of technical innovations and investments in research and development on the firm's costs of employment adjustment, hiring and separation costs in particular. To perform their study they merge data from two sources: a file of financial outcomes measured at the firm level and used frequently for investment studies in the UK and a census of major technical innovations collected in Great Britain since 1945. Their statistical results show that even though in the aggregate adjustment costs are important, the firms with larger stocks of technical innovations had lower adjustment costs and the firms with the largest stocks of technical innovations faced no adjustment costs at all. The results were produced using a statistical model (SN-GMM) that allows for non-observable heterogeneity among the firms. Brown and Medoff, in their contribution, examine a variable often ignored by labor economists but central to many studies in industrial organization—namely, the age of the firm. They look for as many relations as possible between the age of the firm and the general work place conditions. Beginning with a sample of individuals for whom supplementary questions permitted

the identification of the employer, Brown and Medoff add data from the financial services firm Dunn and Bradstreet. The analysis sample consists of 701 individuals with associated firm data. The first result is that employees have as accurate an idea of the size as of the age of their employer. Second, and not surprising, large (and usually older) firms have more formal human resource management systems. Older firms offer more stable employment, at least in the view of their employees, and, furthermore, the employees of older firms are more resistant to unionization than their counterparts in younger firms. The final article in this group, "Worker Quality and Product Quality" by Abowd, Kramarz and Moreau, proposes a test of a hypothesis frequently invoked in the management literature but never directly tested: the higher the quality of the good sold the higher the quality of worker required to make it. To conduct this test the authors begin, once again, with the analysis of Abowd, Kramarz and Margolis, which they use to produce a firm-level file similar to the one used by Abowd and Allain. The measure of product quality comes from an entirely different source—the producer price index microdata. The French producer price indices are calculated at a very detailed level (6 to 8 digit classifications). The basic prices are directly measured at the firms and followed for several years at this source. The authors use as their measure of quality the change in a particular firm's product price relative to the product's 8-digit price index as compared to the change in the relative price of the 6-digit index to which the product belongs. The measure of worker quality is the average value of the person-effects of the firm's employees (calculated by Abowd et al.). The results show that the positive relation exists but is much weaker than might be expected from the human resource management literature. The authors note that the quality of the worker is much more likely to affect the allocation of workers among groups of products than the allocation with any particular group.

4 Compensation Systems

The study of compensation systems is central to labor economics. The role of the firm is critical because a compensation system means the way in which the firm chooses to structure its pay in view of the prevailing market and production conditions. For several years many researchers have believed that variability in compensation systems among firms was the principal explanation for the enormous variability in observed pay that is not related to characteristics of the employee. The articles in this section give a panoramic view of the different methods that have been used to study compensation system design.

Davis and Haltiwanger examine the relation between the size of the employer and the internal variability of compensation for a sample of American manufacturing establishments in their article "Employer Size and the Wage Structure in U.S. Manufacturing". They decompose the variance of individual wages into a part due to between establishment differences and a part due to within establishment differences. Combining data from the LRD (see above) and the American Current Population Survey, the

authors find that the variance of wages diminishes rapidly as firm size increases for nonproduction and supervisory employees but less so for production workers. Differences in within firm wage variability that are related to the size of the establishment hide important variability due to observable heterogeneity of worker characteristics and due to unobservable (to the statistician) worker heterogeneity. Unobserved worker heterogeneity is responsible for the largest part of the dispersion in wages at the smallest establishments. In further analysis, they show that the between establishment variance in average wage rates explains 59% of total wage variance. In contrast, within firm variation in production worker wages accounts for only 2% of the total variance. The authors relate these results to a variety of current compensation system theories. While Davis and Haltiwanger use information from two distinct surveys, one of employers and the other of individuals, Kramarz, Lollivier and Pelé in their article "Wage Inequalities and Firm-specific Compensation Policies in France" have access to data on establishments and the actual employees of those establishments. Thus, for each establishment in the salary structure surveys they use (ESS 1986, 1992), the authors have access to a random sample of the employees. They show that while total wage variance grew slightly between 1986 and 1992, the largest part of the growth comes from an increase in the variability of the establishment effects estimated separately from wage equations for each of the two years. Using a subsample of establishments present in both years the authors attempt to explain this increase in variability of firm-level compensation systems. They find that the establishments with the largest increases in their establishment effects were those that signed an accord d'entreprise (firm-level collective bargaining agreement), experienced substantial employment growth, increased the use of production teams, or increased the proportion of employment of the most skilled groups. Finally, using within establishment regression analysis, they find that the effect of seniority on wages has diminished over this period while there has been a tendency to hire younger workers and layoff older ones. Casavola, Gavosto and Sestito use longitudinal data on Italian firms to study the effect of technical progress on the variance of wage rates in their article "Technical Progress and Wage Dispersion in Italy: Evidence from Firm's Data ". The data, which were derived from a match between social security data (wages and employment as reported to the agency administering social services data aggregated into occupational categories) and the Bank of Italy's financial report data base (maintained at the firm level), cover 20,000 firms in all sectors from 1986 to 1990. The results show that, as in the other European countries for which similar data exist (France and Germany) and unlike in the United States and the United Kingdom, wage inequality between firms has stayed constant over the period studied in Italy. Furthermore, the authors find that the demand for skilled workers has increased the most in firms that have had the most technical innovations. Salaries, however, do not appear to have increased in these firms. The authors interpret these last two results as a peculiarity of Italian centralized wage setting mechanisms. In her article "American employer Salary Surveys and Labor Economics Research: Issues and Contributions" Groshen surveys the usefulness of wage survey data collected by firms from other firms for the purpose of internal wage setting by these firms. Many American organizations

conduct and participate in such studies: the Federal government, the Federal Reserve Banks, human resource management consulting firms, professional associations and similar organizations. The surveys are primarily used to compare the salaries in one organization with the salaries in a carefully controlled group of comparison jobs at other organizations. Because such surveys include data on multiple individuals and their employing firms, Groshen surveys the extent to which these surveys (in particular the one conducted by the Federal Reserve Banks) can be used to model questions in labor economics. The author shows how such surveys can be used to study firm-level compensation policies, interindustry wage differentials, persistent between-firm wage differentials, the increase in American wage inequality, the effect of takeover bids on compensation and benefits, male-female wage differences, and other questions. For each question the author discusses what can be learned from existing surveys and the methodological difficulties that qualify these results. In the final paper in this volume, "Cohort Effects and Returns to Seniority in France", Margolis studies the effects of allowing firm-level heterogeneity and cohort effects on the estimated returns to seniority. Using, once again, the French data constructed by Abowd, Kramarz and Margolis, the author compares different methods of estimating the return to seniority: least squares, within-person estimation with fixed person effects, Topel's two-step method, the projection method in Abowd, Kramarz and Margolis, and finally a method with firm-specific cohort effects. The results show clearly that methods which impose homogeneity across firms in the return to seniority yield positive estimates of that return while methods that allow heterogeneity (by cohort or by firm) produce an estimate of the average return to seniority that is very near zero (and precisely estimated). Estimates that include both firm-specific seniority effects and cohort effects explain substantially more of the variance than the other methods. The author also notes that existing theories of the return to seniority cannot explain these results.

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