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HUMAN RESOURCE MANAGEMENT POLICIES AND PRODUCTIVITY: NEW EVIDENCE FROM AN ECONOMETRIC CASE STUDY

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ABSTRACT

First we distinguish various approaches used by economists to assess the impact of human resource management practices on productivity and then we briefly review and illustrate studies that represent different approaches. In the main part of the paper we illustrate the econometric case study method, by using new data to analyse a case from retail trade and by emulating an approach used in an earlier study. Consistent with theory we find that when employees have opportunities to participate, to receive appropriate information and pertinent rewards, a one standard deviation increase of the first principal component score would increase productivity by 1%. Our findings imply that there are benefits to innovative work practices even in settings where employees do simple tasks and employees are relatively low-skilled. Since our findings are similar to those contained in a previous study, our results also indicate the value of replication studies.

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I. INTRODUCTION

In this paper we begin by distinguishing various approaches used by economists to assess the impact of human resource management (HRM) practices on productivity. We also briefly review and illustrate studies that represent the different approaches. Since it is less well known, in this first part of the paper we focus on an emerging research method in labour economics, namely econometric case studies. Econometric case studies employ econometric methods and focus on a single organisation, where the unit of analysis is typically some subunit of the organisation (e.g. plant, production line, team, or individual). It is a quite recent empirical approach that has crucially been influenced by the development of personnel economics (see Lazear (1999) for an overview of personnel economics).

In the main part of the paper we illustrate how concerns of the external validity of case studies can be addressed by carefully emulating an approach used in an earlier study (Jones et al. 2006a). We report the results of an econometric case study in a retail firm. Consistent with theory we find that when employees have opportunities to participate, to receive appropriate information and pertinent rewards, a one standard deviation increase of the first principal component score would increase productivity by 1%. Our findings imply that there are benefits to innovative work practices even in settings where employees do simple tasks and employees are relatively low-skilled. Our findings are similar to those contained in the previous study, thus increasing the confidence that our findings reflect true economic gains from HRM practices, rather than simply arising by accident. We conclude by briefly considering some possible new directions for the study of the effects of HRM policies on productivity.

II HRM Practices and Productivity: Conceptual Frameworks and Empirical Approaches

Perhaps reflecting the dissemination of participatory practices during the last twenty years or so, there has been much recent discussion of the effects of employee involvement,

empowerment, participation in decision-making, team work, self-managed groups, profit sharing and stock ownership on economic performance. Equally it is clear that there are many ambiguities surrounding the meaning of terms such as “employee participation in decision-making” and “profit-sharing.” To help clarify the meaning of such terms we find it useful to use a broad conceptual framework that distinguishes different schemes both in theory and in practice according to the extent of employee participation in economic rewards/or control, and to view them as different degrees of employee ownership. A benchmark firm is one in which employees receive a fixed wage and have no formal machinery for participation in decision making. (See Ben-Ner and Jones, 1995 for an extended discussion of this typology.) However, there are many other arrangements which, broadly speaking, may be classified into three groups.

First there are plans for participation in economic returns alone such as by sharing directly in returns (profits, productivity gains etc.) or in assets that generate them. The major examples include profit sharing plans and employee stock ownership plans. Second, some schemes allow only for participation in control. Institutionally there are a wide variety of such plans including quality circles, autonomous work groups, work teams and co-determination. Third are schemes with participation in economic returns and in decision-making. Examples include Japanese manufacturing firms in which quality circles co-exist with profit sharing and employee stock ownership plans.

There is also a growing theoretical literature that investigates the impact of varying degrees and combinations of rights to control and to economic returns upon individual motivation, individual performance, organizational and structural variables and organizational performance. Depending on the particular institutional structure, attitudes of the participants and the historical context, a general finding of this literature is that a range of hypothesized outcomes can be expected. However, many (e.g. Ben-Ner and Jones, 1995) expect that productivity will be expected to be enhanced when there are arrangements that link participation in control and participation in

economic returns. Besides providing for opportunities to participate and receive pertinent rewards, others including Appelbaum et al. (2000) and Ichniowski et al.(2000) emphasize that it is incumbent that employees also obtain appropriate training and information in order for enterprise performance to be expected to be improved.

Turning to the empirical literature on the linkages between HRM practices and organizational productivity in industrialized market economies, we note that this literature has grown enormously, as evidenced by many good and accessible reviews (see for example Ben-Ner et al. (1996) and the essays in Lewin et al. (1997) and Blair and Kochan, 2000). Here we simply note some of the main approaches that have been adopted by applied economists, provide some illustrative studies and also briefly assess the challenges that face empirical inquiry that use the different approaches.

Most studies test hypotheses by using data collected at the firm level. Usually such studies gather data from firms in different industries (e.g. Jones and Kato, 1995). Even if firms are nominally in one industry such as construction, in fact firms may operate in different market niches. Thus such studies necessarily must employ limited controls. Also since data on HRM practices are typically collected via surveys, they suffer from the inability to control heterogeneity among establishments within the same firm. Relatedly, such studies must employ *de jure* rather than *de facto* measures. For example, concerning the scope and nature of employee participation, typically the available information is whether a particular institution exists (e.g. is there a works council?) rather than an informed assessment of how the institution is actually functioning. Also such surveys typically suffer from severe measurement error—for example in studies of manufacturing firms it is usually impossible to measure physical productivity. Instead this conceptually preferable measure is approximated by value measures such as sales. This means that in cross-firm studies, other forces that affect these value variables, such as the degree of competition and market power, necessarily

affect the measure of enterprise "productivity". Also quality cannot be reliably compared across firms in such studies.

These limitations have led many authors in recent years to go inside the "black box" and undertake insider econometric and econometric case studies. One approach is that of insider surveys (also called "informed surveys" in Bartel et al. (2004)). The hallmark survey study is Ichniowski et al. (1997) who visited 17 US steel plants and collected data from 37 different steel finishing lines. Their data on HRM were collected by standardized interviews. Unlike traditional survey work by economists, this study includes significant amounts of fieldwork and researcher involvement in data collection. A major motivation for this type of research has been the access to improved measures of productivity. Ichniowski and Shaw (2003) and Bartel et al. (2004) provide good surveys on this type of approach.

Unlike firm level studies both insider survey studies such as Ichniowski et al. (1997) and econometric case studies such as Hamilton et al. (2003) make use of field work to acquire a thorough understanding of the production process and the precise properties of the available performance data. Also they are able to use rich controls and to account for heterogeneity among establishments within the same firm.

Differences between the econometric case study and insider survey methods stem in part from the ease with which the former approach is able to investigate particular issues because of the lower level of aggregation employed in such studies. Thus econometric case studies are able to use specifically designed employee questionnaires to investigate a broad range of worker outcomes which is a troublesome procedure for survey studies that cover multiple establishments. Similarly it is relatively easier for the case study method to be used in designing experiments. Also in econometric case studies the balance between quantitative and qualitative analysis is different with qualitative data having a supportive, although often an important, role.

To illustrate some of these points, in the rest of this section we briefly review some findings in the econometric case study literature and key characteristics of some of those studies. A significant set of key econometric case studies concern the effects of piece rates (Paarsch and Shearer, 1999, 2000; Lazear 2000; Shearer 2004; Bandiera et al. 2005; Freeman and Kleiner 2005). Typically these studies find positive and often very sizable productivity effects of individual incentive schemes (e.g. 44% in Lazear (2000); 59 % in Bandiera et al. (2005)). Other issues that have been studied by using econometric case study methods include the effect of teams on productivity (Hamilton et al. 2003; Jones and Kato 2006; Jones et al. 2006b) and profit-sharing (Knez and Simester 2001).

When output cannot be measured with the same precision, the unit of analysis is at a more aggregate level and measurement takes place less frequently. This is the case with the two service sector studies, Bartel (2004) on banking and Jones et al. (2006a) on retail trade. Both of these papers use establishment level data that are either annual or monthly and find evidence that the HRM environment significantly affects productivity.

Compared to firm-level studies another potential advantage of econometric cases is that they allow the use of interviews; these may provide important clues as to how to interpret other data. Paarsch and Shearer (1999) provide a good illustration of this point. Contrary to theory, when they regress trees planted on the intensity of the piece rate, they identify a negative relationship. However, interviews revealed that piece rates are adjusted upward when the planting conditions are particularly difficult, thus generating the observed negative relationship (see pp.651-2).

While interviews are conducted in nearly all econometric case studies, the use of surveys is rarer. One exception is Bandiera et al. (2005) who use survey evidence collected on the social networks of employees to determine whether lower productivity that was observed under the relative incentive system was attributable to pure employee altruism, or whether it reflected collusion among friends. Their results strongly supported the latter interpretation.

III. A NEW APPLICATION: AN ECONOMETRIC CASE STUDY IN RETAIL TRADE

(i) Purpose

To further illustrate the econometric case study method, in the remainder of this paper we present new evidence from an econometric case study. In so doing we emulate the approach that was used in an earlier study. We do this in large part because a critique that is often voiced concerning econometric case studies is that their value is limited since findings cannot be generalized and thus their external validity (generalizability) is poor. In attempting to replicate results in a different but related context, our approach is thus reminiscent of that adopted by Ehrenberg and Bognanno (1990), who replicate their original study of US golf tournaments by using data for European tournaments.¹ Since the data that can be received from the case sources are often fairly idiosyncratic, the replication problems in econometric case studies may be more severe than in many other contexts. Fortunately, this potentially serious problem of obtaining data that are comparable to those used in the original study, is a challenge that we are largely able to successfully overcome in our replication study.

The study we aim to replicate is Jones et al. (2006a). In that study, the effects of HRM environments in a national retail trade chain, hereafter RETAILONE, consisting of 47 stores were studied. The HRM data were collected from employee questionnaires the company has administered annually. We have monthly data on value added, hours worked, and annual data on store space over the period of 2001-2003. In addition, we have control variables for economic environments in different regions and employee characteristics. Our results show that the individual components of HRM environment mostly have statistically significant impacts on productivity. Of the individual characteristics, on-the-job participation and information sharing have a significant impact on productivity. When we aggregate the HRM components by using principal components

analysis, we also find evidence of statistically significant effects. For a one standard deviation unit increase in the HRM environment indicator, we find that productivity increases by 3%.

The case analysed in this paper, hereafter RETAILNEW, is a different chain belonging to the same conglomerate as RETAILONE. This enabled us to collect very similar, though not identical, data on HRM. Our productivity measure and key inputs are also measured in similar fashion to procedures used in the first paper. However, in this new case we were not able to collect either as rich a set of control variables or information on manager changes, both of which we had for RETAILONE.

(ii) Description of the case

RETAILNEW is a Finnish firm in the non-food retailing sector. Our understanding of its institutional details is based on interviews at the firm's headquarters and at two stores. In each store, we interviewed the store manager and two salespersons. These interviews enhanced our understanding of daily job assignments for salespersons and also how their personal work input could influence productivity.

The firm has 34 retail outlets around Finland, making it a large retail firm by Finnish standards. Each outlet sells similar items, although there is variation in the number of items sold, since the outlets are of different size ranging from floor space of 2106 m² to 9390 m². Among the 34 stores, 8 are concentrated more on home decorating and renovation. The 26 basic stores have three departments: clothing, home, and leisure. The remaining 8 stores are heavily focused on the home department; while they also have a leisure department they do not sell clothing. The retailer is neither a discount retailer nor can it be considered as a specialized or upscale retailer. Its strategy is to sell rather standard products to a wide range of customers with all items in stock on display. The employees' main tasks are customer service and maintenance of the store (i.e. receiving goods, shelving items, and maintaining the appearance of the store). Personalized customer service is emphasized and personnel are expected to initiate interactions with customers.

All units share a similar formal set of HRM policies, and for the most part they can be described as quite traditional and many innovative HRM practices are absent. For example, employees receive a fixed hourly wage, which is determined by the collective agreement in the retail sector; only managerial employees are entitled to incentive pay. Some employees having more responsibility get a somewhat higher (5-10%) fixed wage than ordinary employees. Thus motivating employees to put forth discretionary effort must rely mainly on intrinsic motivation and managerial recognition. Employees are organized in teams by departments. At each department, there is a department manager and some senior employees have specific responsibilities over certain product lines. But the majority of employees work broadly in their departments. The department manager is appointed by the store manager and this task does not rotate. Employees working at the department do different tasks, including work at the cash counters. If needed, they are also expected to work at other departments, though this rarely happens.

A central feature of the HRM environment is regular meetings between the supervisor and employees. The management team of the store has a meeting each morning that lasts 10-15 minutes. The tasks for the day are planned in these meetings. Thereafter the department manager has a similar meeting with employees where the day-to-day operations of the department are discussed. Employees get information that helps them to plan their own work. From each daily meeting, a written document is made available to employees immediately after the meetings. This is important for transmission of information, since employees work in shifts and hence many employees are unable to attend the morning meeting. In addition, each month there is a departmental meeting and also a meeting when all store employees attend. At these meetings employees receive group feedback about their collective performance. Also matters such as the strategic plans of the stores and departments and information concerning forthcoming sales campaigns are discussed.

At the individual level, there is also a policy of annual development discussions which focus on how employees have performed in their jobs, how they could further improve, what training needs they have, and their future prospects within the store. Arguably these discussions provide an important channel for non-monetary rewards in the form of managerial recognition.

Despite the fact that there is a company HRM handbook that stores have to follow, store managers and department supervisors have discretion in the implementation of HRM practices. As was confirmed by our visits and discussions, what this means in practice is that substantial variation in HR environments exists within different stores in RETAILNEW.

In our store visits, we asked managers and employees how company salespersons can influence store productivity. One of two broad categories of reasons frequently mentioned by both groups was shelf-management, item display, and the overall appearance of the store. Employees have a lot of discretion concerning item display. In turn this influences the lay-out of the store, which potentially has a large impact on sales. The role of item display is especially pronounced in the stores that focus on home appliances.

The other set of reasons concerns interaction with customers. Keaveney (1995) has shown that unresponsive, uncaring, impolite and poorly informed service employees lead to customers changing the service provider. In our case study chain, employees received a lot of specialised training on customer service organized by the chain. Improving customer service has been a major development focus in the past few years.

(iii) Theoretical framework

We focus on those theoretical issues that are most pertinent to RETAILNEW². As indicated earlier, a useful framework for analyzing the effects of employee involvement has been developed by

Appelbaum et al. (2000). Their premise is that employees may possess valuable information on the production process (here the service process) that management may not have. The firm would like its employees to contribute their ideas and effort to benefit the organization. In order to elicit higher discretionary effort from employees, three conditions have to be met. First, employees need to be able to participate in substantive decisions. Second, employees need to have appropriate skills and, third, employees need appropriate incentives.

This framework implies that employees cannot supply discretionary effort if they do not have either the channels through which to participate in substantive decisions or the skills required to make it worthwhile or sufficient information. In addition this framework implies that employees are not willing to supply discretionary effort if they do not have the appropriate incentives to do so. Thus this framework emphasizes the need for a coherent system of HRM practices. The benefits of coherent practices are not unique to this framework, but there appears to be consensus that the economic payoff of HRM practices is likely to be greater when packages of measures exist (see e.g. Ichniowski et al. (1997) and Ben-Ner and Jones (1995)).

In RETAILNEW, the opportunity to participate in substantive decisions concerns mainly item display and the layout and maintenance of the store. The marketing literature has established that these factors affect performance. Simonson (1999) provides evidence of the impact of layout on performance while Bitner (1992) shows that the overall cleanliness and orderliness of the store affects the ability of customers to achieve their objectives in the store. While formal models of shelf management are complex, nevertheless these models show the potential benefits flowing from employee involvement in shelf management decisions.³

The opportunity to participate may also affect customer service. In situations where salespeople are frequently in contact with customers, employee motivation, interpersonal skills and product knowledge become important. It has been argued that participatory HRM policies may facilitate employee motivation and skill development (see also Batt, 1999; Bartel, 2004). Bell and Menguc (2002, 140-141) highlight the role of job autonomy, empowerment, and information on customer-oriented behaviour. They also show that increased customer-orientation leads to increased customer perceptions of service quality.

Participation and skills can increase performance only when employees are well informed on what their tasks involve and how their success can be measured (Preuss 2003). Therefore we include information regarding the performance of departments as a part of the overall HRM environment in our estimations.

In circumstances where the role of the monetary incentives is limited, as at RETAILNEW, the role of managerial recognition in providing incentives may be pronounced. For instance, Benabou and Tirole (2003) argue that managerial recognition of work that is well done may increase agents' intrinsic motivation to put forth effort in the future.

Compared to manufacturing, the impact of HRM policies on performance may be smaller in the service sector. According to Ben-Ner et al. (1999), in situations where task uncertainty, task interdependence and task complexity are relatively low, the pay-offs to innovative HRM practices are relatively low. By and large they argue that retailing firms are expected to provide good examples of this characterization. Banker et al. (1996) argue that HRM practices have a higher pay-off in situations where there is a personalized interaction between customers and salespersons. Since the level of personalized transaction in RETAILNEW can be considered to be moderate at

best, these considerations imply that the role of HRM would be less important in this particular retail case. On the other hand, other researchers maintain that the positive predictions of the high-performance paradigm apply equally to the service sector (see especially Appelbaum and Batt 1994; Batt 2002).

(iv) Comparison between the two cases

The key differences in the organization of work at RETAILNEW and RETAILONE are that in the present case employees have broader responsibilities and more emphasis is placed on personalized customer service and interaction with customers. Stores are also bigger than in RETAILONE. Meetings between supervisors and employees take place also more frequently. One reason for this may be that the departments are much bigger at the present chain, and thus there is a need for more formalized information systems.

A higher level of personalised interaction with customers suggests that the benefits from a good HRM environment should be at least as high at RETAILNEW as at RETAILONE. Also many employees have broader job tasks, making information sharing even more important. At the same time, since many employees are expected to perform more general tasks, their input into the planning and development of their job may not be as crucial as at RETAILONE, where employees had highly personalized responsibilities over certain product lines. But in general the differences between the two chains are not very pronounced (for instance, neither chain is an upmarket provider), so we would expect the results concerning HRM to be rather similar.

(v) Data

The data cover all 35 establishments at RETAILNEW that were in operation during 2002-2005. All except one establishment had begun operations before the sample period, and none closed down

during this period. We have to exclude the entering establishment from the analysis, since it enters in September 2005, and not all data are available for that unit. The data include 48 (1:2002 to 12:2005) observations for each store.⁴ Summary statistics are given in Table 1.

The dependent variable is value added, essentially the value of sales net of taxes and purchases. This is generally viewed as the preferred performance measure in retailing (see, e.g. Reardon et al., 1996) and it a measure that is used by the case itself to gauge relative efficiency within the business. The inputs are hours worked and retail floor space measured in square meters, again measures that are standard in the retail literature.

Data from annual personnel surveys administered by an independent consulting firm are used to measure the HRM environments. The respondents are sales clerks. These surveys include questions that enable us to assess the key features of the HRM environment. The HRM variables differ somewhat from those used in analysing RETAILONE because a change in the questionnaire in 2004 means that identical questions were not asked for all years. However, many key variables are the same and others are quite close to those used previously.

Our first measure is “Development talks”, which is the share of employees who have gone through development talks (with either their supervisor or manager). The other measures of the HRM environment are perceptual. The opportunity to participate in substantive decisions (“Participation on the job”), which theory suggests is potentially an important driver of business performance, is measured by the mean of the answers to the statement “I can participate in planning and development of my work” using a five point Likert-scale ranging from “disagree strongly” (=1) to “completely agree” (=5). Other variables are measured similarly. Theory also suggests that effective participation in decision-making requires not only appropriate channels but also adequate and

appropriate information. “Information sharing” is the mean of the answers to the statement “I get enough information that is needed to manage in my job”.

Earlier it was also argued that information concerning group performance is important for employees’ effort decisions. The variable “Performance monitoring” measures managerial attention to performance and is the mean of answers to the statement “Performance and achievement of goals are followed adequately in our department”. Our theoretical framework also suggests that recognition from and confidence in management are important incentives for the employees to supply discretionary effort. To capture this aspect of the HRM environment “Supervisor fair” is defined as “Our supervisor treats people fairly” and “Supervisor efficient” is defined as “Our supervisor manages and organizes our work efficiently”⁵. Typically the mean of these perceptual HRM variables is around 4, ranging from around 3 to 4.5. Compared to RETAILONE, the variables tend to have slightly higher means and smaller standard deviations-- there is less variance in the present case. Since survey responses are missing for one unit in two years, there are 1560 usable observations for the HRM variables. In addition to the individual HRM variables we also use summary measures to depict the overall HRM environment. These measures are discussed in more detail in the next section.

(vi) Methods

The starting point of the analysis is the following augmented Cobb-Douglas production function

$$VA_{imy} = A_{imy} S_{imy}^{\alpha} (EL_{imy})^{\beta}$$

Where VA_{imy} is value added of the unit i at time month m and year y , A_{imy} represents productivity shocks, S_{imy} is floor space, and EL_{imy} is effective labour. The level of effective labour depends on the vector of HRM policies, and we specify it as follows: $EL_{imy} = H_{imy} e^{\beta'_{HRM} HRM_y}$, where H_{imy} is the number of hours worked. The productivity shock can be decomposed into a permanent effect, time

effects, and other shocks which vary over time and over establishments. We specify the productivity shocks as $A_{imy} = e^{\beta_m \text{MONTH} + \beta_y \text{YEAR} + v_i + \varepsilon_{imy}}$. Taking logs of the augmented production function we get

$$y_{imy} = \beta h_{imy} + \alpha s_{iy} + \beta \cdot \beta'_{HRM} HRM_{iy} + \beta'_m \text{MONTH} + \beta'_y \text{YEAR} + v_i + \varepsilon_{imy}$$

where: y_{imy} is the logarithm of value added in establishment i at month m , year y ; h_{imy} is the log of hours worked; s_{iy} is the log of floor area; HRM_{iy} is a vector describing the human resource management environment measured annually; MONTH is a vector month dummies capturing seasonal effects; YEAR is a vector of year dummies capturing the effects common to all establishments in a given year; v_i is the establishment level unobservable component; and ε_{imy} is an error term.⁶

Some issues arise in the estimation of the preceding equation. First, we allow the establishment specific error term v_i to be correlated with the explanatory variables; that is, we estimate fixed effects models. This seems reasonable since the most natural interpretation for v_i is that it is a permanent performance effect for each establishment and it is plausible that the input choices and the HRM choices may depend on this permanent effect. This permanent effect captures all time invariant factors influencing productivity.

Second, in panel data models it is usual that the error terms ε_{imy} are serially correlated. If this is the case, then it has to be taken into account when calculating the standard errors. Preliminary analysis shows that this is indeed the case in our data. Since our panel has quite a long time dimension, and the time dimension is larger than the cross sectional dimension, we use Newey-West type standard errors which take into account serial dependence in the errors.

Third, as the HRM practices tend to be quite highly correlated, estimating their coefficients precisely is problematic (See e.g. Cappelli and Neumark (2001)). One way we respond to this collinearity problem is, as in Cappelli & Neumark (2001), to conduct an F-test of the joint significance of the HRM vector. In the case of collinear variables it is often the case that they are not individually significant, but that they are jointly significant. Second, we create a summary measure of the HRM environment. Summary measures tackle the problem of collinearity by summarizing the information contained in the separate variables into a single measure. A convenient way to create this summary measure is to use principal component analysis. This technique basically tries to find weighted summations of the data that would preserve the maximal amount of information (for details see e.g. Mardia et al. 1979). The principal component scores used in the analysis are obtained after performing the principal component analysis for each year separately. We choose to retain the first four components that together explain over 90 % of the variance⁷. Based on these components, the linear combinations of the variables (i.e. weighted sums) are calculated for each establishment in each time period, and these are used in the regression analysis. Based on the principal component analysis we constructed an additional scale for the HRM variables. To do this we excluded development talks from the scale, since the first principal component puts least weight on this variable. The resulting scale has five components and Cronbach's alpha (scale reliability coefficient) of 0.9. This approach to the creation of an index is similar to the procedure used by others such as MacDuffie (1995).

(vii) Results

The estimation results are given in Table 2⁸. The first column gives the baseline specification, which excludes the HRM variables. The specifications reported in columns 2 through 7 reflect our entering the HRM variables one at a time, while the results in column eight include all HRM variables. The results reported in column one show that both inputs have a positive and statistically

significant effect on performance. When the HRM variables are entered one at a time, we see that each coefficient is positive and information sharing, development talks and supervisor manages efficiently are significant, and imply around a 1% increase in value added for a one standard deviation increase in the explanatory variable. When all the HRM variables are entered simultaneously, only development talks are found to be statistically significant.

The results in Table 2 have shown that HRM practices may have an impact on productivity, even after controlling for establishment fixed effects. To better assess the joint impact of the HRM variables, in Table 3 we report results using summary measures to capture the HRM environment. The first column reports the results when using the principal component scores and we see that the first principal component score has positive and significant productivity effects. This variable weights the perceptual measures quite evenly, and development talks substantially less. Again, the effect of a one standard deviation increase in the score leads to an increase of around 1% in value added. The only other significant principal component scores is the second one; this puts most weight on development talks. The results using the scale which omits development talks are reported in the remaining column and yield an impact of similar magnitude. These results suggest that when HR environments have high overall scores concerning information sharing, participation in decision making, performance monitoring, and efficiency and fairness of supervision, and development talks are conducted regularly, they will enjoy better performance.

Whereas results obtained for RETAILONE (reported in Jones, 2006a), suggest that the impact of HRM policies was around 3% for a one standard deviation increase, here the impact is smaller, around 1%. This may be due to the fact that the stores of RETAILNEW are much more capital intensive. The impact of HRM policies, which mainly operate through employees, can be expected to be smaller in this case. Another key difference is that the variable “participation on the

job” is not significant. This may be due to differences in the organization of work. In the present firm, employees have broader responsibilities over product lines; this means that department managers must assume a heavier burden in planning. Additionally “participation on the job” exhibits smaller variation in the present case, and its impact may be harder to identify than in RETAILONE. Yet another difference between these two cases is that we find that development talks have a positive effect in RETAILNEW, while they were found to be insignificant in RETAILONE. Although development talks have a similar function in both chains, our interviews suggest that they are conducted more effectively in RETAILNEW.

However, in the main, the results between these two stores are very similar, indicating that more participatory HRM environments do have positive effects on store productivity. The fact that the two sets of results are so similar increases the confidence that the findings from one econometric case study can indeed be generalised to other related settings.⁹ Our results are also supportive to those who argue that the benefits of high-performance work systems materialize also in service sectors (Appelbaum and Batt 1994; Batt 2002).

IV. CONCLUSIONS

In the first part of the paper we briefly review recent approaches to the analysis of the impact of HRM on productivity. We focus especially on an emerging method, econometric case studies, summarizing briefly the main applications of that method.

In the second part of the paper we present what we believe to be the first replication study of an econometric case study. As such, a key aim of this exercise is to investigate the external validity of the method. To do this we examine whether the results obtained in the original study can be generalized to a distinct setting that, nevertheless, is similar in many ways to the first setting. A

second aim of our empirical work is to learn more about the effects of HRM practices on productivity in retail trade, a topic which is rather controversial in the literature. The results that we obtain from this new study are very similar to our earlier study, thus increasing confidence in our earlier conclusion that HRM policies and practices do matter for productivity in retailing.

Finally we briefly consider the potential of the econometric case study method for future studies. We note that there are still many potential advantages of the method that do not appear to have been used to best advantage to date. One example is that, with some limited exceptions (e.g. Jones and Kato (2006) and Bandiera et al.(2005), the potential for realizing major gains exists by combining different types of data within the case has not been exploited. For example by combining customized survey data within a case with objective performance data one can begin to better understand the specific channels through which HRM policies may enhance enterprise performance. Another possible extension of the method that promises large payoffs is to use multiple units such as employee outcomes and firm outcomes. One obvious route is to try to assemble and combine panels of data for employee outcomes with panels of objective performance data. Finally, as researchers develop trust with key personnel at the case, the possibility arises of persuading the case to permit experiments to be undertaken. To date it appears that the only published study along these lines is Shearer (2004).

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TABLE 1
Descriptive statistics

Variable	Obs	Mean	Standard deviation
Inputs and Outputs			
Log Value added	1584	1,14	0,48
Log Hours	1584	8,72	0,34
Log Space (m2)	1584	8,40	0,37
HRM			
Information sharing	1560	3,89	0,29
Participation on the job	1560	3,86	0,30
Development talks	1560	0,83	0,14
Supervisor fair	1560	4,04	0,38
Supervisor efficient	1560	4,01	0,33
Performance monitoring	1560	4,11	0,27
Principal component score 1	1560	0,00	1,81
Principal component score 2	1560	0,00	1,03
Principal component score 3	1560	0,00	0,80
Principal component score 4	1560	0,00	0,69
Scale	1560	0,00	0,81

Notes. 1) See Section IV (iii) for details of the HRM variable definitions.

2) All monetary values are in real terms and measured in euros. The deflator is monthly consumer price index, where Jan. 2000=100.

TABLE 2
The Impact of HRM on Productivity: Establishment Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(8)	(9)
Log Hours	0.541*** [7.10]	0.515*** [6.45]	0.515*** [6.46]	0.517*** [6.54]	0.511*** [6.35]	0.510*** [6.36]	0.511*** [6.33]	0.516*** [6.50]
Log Space	0.211** [1.99]	0.208** [2.01]	0.219** [2.13]	0.239** [2.31]	0.232** [2.26]	0.215** [2.12]	0.226** [2.20]	0.207** [2.03]
Information sharing		0.034* [1.73]						0.013 [0.45]
Participation on the job			0.033 [1.41]					0.016 [0.45]
Development talks				0.086** [2.17]				0.071* [1.83]
Supervisor treats employees fairly					0.017 [1.38]			-0.017 [0.76]
Supervisor efficient manages efficiently						0.029** [2.08]		0.022 [0.98]
Performance monitoring							0.03 [1.45]	0.005 [0.19]
Observations	1584	1560	1560	1560	1560	1560	1560	1560
R-squared	0.891	0.894	0.894	0.894	0.894	0.894	0.894	0.895

Notes. 1) Coefficients are reported in the table and t-statistics in brackets.

2) Significance of the variables is indicated as follows: * significant at 10%; ** significant at 5%; *** significant at 1%.

3) The t-statistics are robust to heteroscedasticity and autocorrelation within each establishment.

4) The specifications include a constant as well as month and year dummies.

TABLE 3
The Impact of HRM on Productivity Using Summary Measures

Principal component score 1	0.006***		
	[2.58]		
Principal component score 2	0.011**		
	[2.02]		
Principal component score 3	0,003		
	[0.53]		
Principal component score 4	0		
	[0.07]		
Scale	0.014**	0.011*	
	[2.21]	[1.74]	
Development talks		0.073*	
		[1.88]	
Observations	1560	1560	1560
R-squared	0.895	0.895	0.895

Notes. Table reports only the coefficients of the summary measures of HRM from fixed effects regressions. Other regressors are the same as in Table 2, and their coefficients are similar to Table 2. For other notes, see Table 2.

Endnotes

¹ Thus unlike others we are not using the term “replication” to mean additional analysis of the original data (usually by researchers different from the original authors) in order to verify findings from the original study.

² See Jones et al. 2006a, for a more elaborate version of the theoretical framework.

³ Also as Borin and Farris (1995) show, if market conditions are rapidly changing the value of these kinds of models is diminished.

⁴ There are a handful of missing observations due to missing personnel surveys for two establishment years.

⁵ In our previous study on retailing (Jones et al. 2006a) we had a variable that focused more squarely on managerial recognition. In this dataset we do not access to that information and thus we use the variable “supervisor fair” to account for managerial recognition. We think it is plausible that a supervisor is more apt to be identified as “unfair” when she did not recognize good work.

⁶ Note that our data comprise a mix of variables that vary by month (such as value added and hours) and other variables that vary annually. Since this presents a potential timing problem, we also estimated models in which we aggregated the performance data to an annual basis. Our preferred estimates based on principal components are insensitive to this procedure.

⁷ The full results of the principal component analysis are available upon request.

⁸ All the models have been estimated using the xtivreg2 package in Stata.

⁹ One should also note that we were not able to fully replicate the empirical approach adopted in Jones et al. (2006a). We do not have manager dummies in the present analysis, nor do we have as rich set of control variables as in the earlier analysis. This makes the comparison of the results less transparent.