

Workplace Practices and Firm Performance in manufacturing: a Comparative Study of Italy and UK.

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Abstract

Using data from the 2004 Workplace Employee Relations Survey on British establishments and two surveys on manufacturing firms located in the North of Italy, we look at the diffusion of new workplace practices in the two countries and at their impact on the firm's value added. We find that the adoption of innovation practices has spread substantially more across the British manufacturing firms than across the Italian ones; however our results also indicate that the practices' association with the firms' VA is much lower in the UK than in Italy. The counterfactual analysis shows that had the Italian workplaces the same characteristics of British ones, in terms of diffusion of practices, capital intensity and skills, their average predicted value added would triplicate. On the other hand, were the Italian establishments to move and operate in the British context, their performance would improve very modestly.

JEL Classification: C33, J41, J53, L20

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1 Introduction

Since the late eighties a growing number of studies has investigated the economic impact of some innovative workplace practices centered on the concepts of employees' involvement, empowerment and autonomy. Although the extensive empirical literature has helped delimiting a consensus set of such practices, which typically include information sharing, formal arrangements to discuss production problems, systems of rewarded suggestions, autonomous team-working, job rotation and de-layering, the further objective of a common definition and measurement of these practices is more difficult to reach. The reason is, quite simply, that workplace practices data are survey-based and partly qualitative in nature; hence the definition of a practice crucially depends on the questions posed, on how they are phrased and ordered in the questionnaires and how the latter are collected. Another usual difficulty is the need to match survey data with balance sheet information referred to the same unit of investigation (firm or establishment), unless the relevant accounting items are collected in the survey itself, but this is uncommon. On the whole, these specificities have limited somewhat cross-country comparison exercises even where nationally representative surveys exist, like in France (REPONSE), in USA (EQW-NES), in Britain,(WERS). Consequently, although most of the evidence agrees that these practices exert a positive impact on firms' productivity and this is true in a number of countries (Greenan (1996), Cappelli and Neumark (2001), Godard (2001), Black and Lynch (2004), Thomas (2004)¹, their relevance in explaining across country firm performance remains largely unexplored. A recent contribution to cross-country evidence, is the work by Bloom and Van Reenen (2007) based on a survey accurately designed and targeted to collect information on managerial practices; the survey addressed a sample of 732 medium-sized manufacturing firms in the United States, the United Kingdom, France, and Germany. They

¹These findings also explains why such practices are also referred to as high performance workplace practices (HPWP)

find a considerable variation of practices across countries and a significant association between better management practices and higher productivity, profitability, Tobins Q, sales growth rates, and firm-survival rates. Another example is Caroli and Van Reenen (2001) who use French REPOSE and British WIRS (successively denominated WERS) to test the skilled-biased organizational change hypothesis across the two countries and the two data sets.

Our paper adds to this limited cross-country literature by comparing innovative workplace practices in the manufacturing sector in Britain and Italy. We use two existing surveys: WERS for Britain and, for Italy, a survey designed on WERS but addressed only to the manufacturing sector of two provinces of Lombardy (described in the next section). The basic research question we pose is whether differences in productivity across the two samples are associated to differences in innovative workplace practices. Our initial objective is therefore to sketch a picture of the diffusion of a commonly defined set of 'standard' innovative workplace practices in the manufacturing sectors of the two countries and our second objective is to investigate the role of these practises on the firm's VA and TFP in the two samples.

At this regard, a crucial point made in the economic and managerial literature is that the productivity enhancing effect of these practices is not granted by their adoption: their distinctive function of addressing the management of people, aiming to obtain the employees' involvement in the production process and their active interaction, implies that these practices' effectiveness rests greatly on how they are made operative (Black and Lynch, 2001). An effective implementation usually implies a deeper reorganization, it is likely to involve higher costs and probably resistance on the part of some groups (typically, middle managers (Batt, 2004)), and to be a lengthy process². It may

²Kato and Morishima (2002) find that participatory human resource management practices lead to a significant increase in productivity only seven years after their introduction; Brynjolfsson et al. (2002) find that the performance effect of the interacted ICT-reorganization term is evident from the third year; similarly Bauer (2003) shows that the productivity effect of implementing high performance workplace practices rises over time and has a positive impact on labor efficiency only in the long run.

therefore happen that innovative practices are present, for example because they pay in terms of image, but their productivity effect is low because substantial reorganizations are avoided or because a poor management quality prevents a full exploitation of their potential.

Our final research question then addresses this issue of the efficacy of the practices versus their extension of adoption and investigates how these two factors contribute to the gap in the average VA (and TFP) between the two sample of firms. By applying a standard decomposition exercise we distinguish the contribution of a different 'endowment' of practices from the contribution of a different efficacy of the same set of practices. We find that 40% of the higher productivity of the British manufacturing firms relative to the Italian firms is explained by a different extent of adoption of the practices and that the remaining 60% is ascribable to a different efficacy of the practices adopted. The practices that the most contribute to the overall higher efficacy are good industrial relations and functional flexibility (job rotation); the practice that mostly contributes to the higher overall 'endowment' effect is financial participation.

2 The determinants of practices across countries

Generally speaking, differences in the extent of adoption and in the effectiveness of the adopted practices may be expected because of firms heterogeneity and because the context in which firms operate is different and leads to different organizational choices. Looking first at the latter argument, one expects market competition to be of some relevance. First of all, because it affects managers' behaviour, and managers are responsible for the decision to innovate; secondly because it also affects workers' behaviour, and workers are those who take active part in the reorganization and influ-

The Danish Ministry of Business and Industry (1996) documents that the implementation of both ICT investments and organizational changes deploys a positive and rising impact on productivity from the fourth year after adoption.

ence its effectiveness.

Drawing on the extensive literature on managers' effort, a well known result is that market competition has theoretically an ambiguous effect on managerial effort essentially for the negative effect that competitiveness exerts on profits, which are a source of managers' earnings (Nickell, 1996 and reference therein). This implies that managers, in a competitive setting, are not necessarily willing to go for the most innovative practices and/or to implement them 'effectively'; the fact that the positive returns from the innovative process may be collected only after a few years may hold back even further the decision to innovate. Hence, as long as the decision to innovate rests on the firm's management, a higher market competition, *ceteris paribus*, does not guarantee, *a priori*, a more extensive use of HPWP nor a better implementation.

In fact, the existing evidence on cross-country comparison of workplace practices concludes that competitiveness is crucial for good management practices and generally for organizational changes. Bloom and Van Reenen (2007) show that the degree of market competition, measured in terms of import penetration, Lerner index of competition, number of competitors, is positively and significantly related to the score of good performing management practices and that, by reverse, low competition accounts for a large proportion of the gap in good practices between Anglo-Saxon countries and continental Europe. Similarly, Caroli and Van Reenen (2001) argue, by comparing Britain and France, that deregulation can be a strong stimulus to organizational changes; in particular they find that in France firms belonging to the public sector as well as unionized firms retard organizational restructuring, while in Britain the substantial legislative changes towards liberalization and the decline of union strength that took place in the eighties appeared to have acted as triggers of dramatic re-organizations (Caroli and Van Reenen (2001) p.27). However, typical indicators of market competitiveness were not found to add significant explicative power to the probability of

organizational changes in their samples³.

As market competition reduces rents, also reduces the possibility for workers to share the rents, either through higher wages or less effort (Nickell 1996). Workers' effort then increases with competition and, other things equal, any practice can therefore be expected to be more efficient in a competitive setting. However, with regards to innovative workplace practices, the more important issue is the workers' resistance to change. Recessions, by rising unemployment and lowering the probability of finding an alternative jobs, generally reduce resistance to change (Schmidt, 1997). Channels that give employees voice and specifically unions also reduce resistance to change as unions' presence guarantees against possible job losses and worsening working conditions (Lynch, 2007). However unions may fear the introduction of innovative practice as the latter may weaken their role by allowing employees to have a direct voice with the management (Freeman and Rogers 1999). On whole, we conclude that whereas the presence of unions has a priori an ambiguous sign on the probability of adoption, and this is indeed confirmed in the empirical literature (Lynch 2007 and references therein), unions' presence is expected to be beneficial to the effectiveness of the existing practices.

Two other determinants of managerial effort emphasized in the literature are shareholders' control and financial pressure (Nickell, 1996). Managerial ownership can in principle discipline the managers but conflicting objectives may prevail beyond a certain equity ownership; external control is usually a safer way to reduce managerial slack: Nickell, Nicolitsas and Drymes (1997), on a sample of UK firms, find that only the presence of an external dominant shareholder affects firms' productivity. Bloom and Van Reenen (2007) find that the probability of bad management rises where the

³Lynch (2007) on a sample of US firms finds that having an external focus (incidence of exports on sales, benchmarking) rises the probability of organizational changes in manufacturing. A broader external focus means more opportunity for comparison of performance, which is also a facet of competition.

CEO is the eldest son of the founder: on the whole, primogeniture and market competition, taken together, account for about half of the badly performing firms in their sample. Cucculelli and Micucci (2008), on a sample of 3548 Italian manufacturing firms, find that post-succession firm performance decreases more in family succession, where the heir is appointed CEO than in firms where the CEO is unrelated to the family. Finally, with regards to the firm's financial pressure, high interest payments relative to earnings raise, *ceteris paribus*, the probability of bankruptcy and hence the pressure for managers to perform well (Schmidt, 1997); the threat of bankruptcy could then induce substantial organizational changes⁴.

Turning to firms' heterogeneity, differences in the production process may also determine different practices. A highly specialized production, for example, may need more training-related practices; smaller firms may need relatively less information sharing; autonomous team working can be more useful where products are technically complex. The presence of high skills and/or ICT investments may induce the adoption of complementary practices. In section... we discuss heterogeneity in our samples which will be taken care, in the regression analysis, by proper controls.

3 The context in Britain and Italy

In this section we discuss the differences of the economic contexts in which the British and Italian firms operate. We will mainly focus on the extent of market competition drawing from country-level information. Some firm-level information on the degree of competition and on the ownership structure is also available in the two samples and is described in section... below.

⁴Market, financial pressure and corporate governance can substitute each other in disciplining the managers (Aghion and Howitt (1996); indeed, Nickell, Nicolitsas and Drymes (1997) find that financial pressure and corporate governance are more effective on firm productivity where market competition is low and rents are high. Likewise, the productivity enhancing effect of innovative practices may not be linearly linked to the degree of market competition as long as other disciplining factors are relevant.

Take a manufacturing firm and place it first in Britain, then in Italy. Which differences in terms of the economic context, would she mostly perceive?

The extent of regulation of the manufacturing sector is likely to be one. According to Nicoletti and Scarpetta (2003, p.29) this is well captured by the administrative burdens and by tariff and non tariff barriers to trade. Indeed, the OECD (2003) indicator of administrative burdens, which varies between 0-6 from least to most regulated, although it declined from 4.64 in 1998 to 2.44 in 2003 is still much larger in Italy than in the UK (0.66 in 2003). Similarly, Djankov et al. (2002) find that Italy is one of the most restrictive countries for the number of procedures required to set-up a business and the UK is one of the least demanding ⁵. Regarding barriers to trade, the difference between the two countries is less striking, thanks to the UE participation: the indicator is 1.15 in 2003 in Italy and 0.36 in the UK.

In addition, the manufacturing firm would also discover that in Italy a further penalization comes from the use of services which also operate in a more regulated market. Indeed, the OECD (2003)'s all-economy measure of product market regulations⁶ ranks Italy fifth, after Poland, Turkey, Mexico and Hungary while the UK sits at the other end, just before Australia.

Another difference between the two contexts is the employment protection legislation: again, the UK is one of the most liberal countries and Italy one of the strictest (Nicoletti et al. (2000)) although the surge in temporary contracts, since the late nineties, have reduced somewhat the famous rigidity of the Italian labour market.

⁵An entrepreneur in Italy has to follow 16 different procedures to acquire the necessary permits to start a business, which is the same number required in Senegal, Ecuador, Romania and Vietnam, and well above the worldwide average number of 6.04 procedures. The corresponding number for UK is only 5. This study also finds, that in Italy the minimum time to start up a firm is about 62 days, while in UK is just about 4 days.

⁶This measure captures: (1) barriers to entrepreneurship (e.g., administrative burdens on start-ups and corporate firms, licensing and permit systems, existence of antitrust exceptions for public enterprises), as well as (2) state control over business enterprises (e.g., size of public enterprise sector, price controls in competitive industries) and barriers to international trade and investments

If innovative workplace practices are a way to perform better⁷, and competition exerts a positive pressure to do so, then, other things equal, we expect innovative practices to be less common in the Italian context.

4 The datasets

For the Italian sample of firms, workplace data are drawn from two surveys jointly conducted in two adjacent provinces of Lombardy. Lombardy, located in the North of Italy, is the most industrialized region of the country, producing over 27% of the Italian industrial VA (excluding constructions) and employing over a fourth of the Italian employees of the industrial sector (all data refer to 2003). The two provinces together make up, in 2003, 23% of the region's industrial VA (excluding construction) and employ an equal percentage of workers in the same sector. Their productive structure is well representative of large areas of the North of Italy and some areas of Central Italy, which make us believe that the analysis, although carried out on a specific sample of firms, can provide valid results beyond the local context.

In particular, the sources of information used for the empirical analysis are the following: 1) a survey conducted in 2003 and addressed to all the firms with more than 50 employees belonging to the Industrial Employers Confederation of the province of Bergamo; 2) a very similar survey conducted in the same year and addressed to all firms

⁷Most of the evidence supports the productivity enhancing effect of high performance workplace practices. Ichniowski, Shaw and Prennushi (1997) find that in the US steel finishing industry productivity rises by 6.7% under innovative human resource management systems. Black and Lynch (2000) confirm the role of workplace reengineering and new human resource practices for productivity using US nationally representative data. Similar conclusions have been reached for Germany (Bauer, 2003; Zwick, 2004), France (Greenan, 1996; Caroli and Van Reenen, 2001) and Italy (Cristini, Gaj and Leoni, 2003). However, Freeman and Kleiner (2000) and Capelli and Neumark (2001) do not find a significant impact of employee involvement programs on productivity and Godard (2004) argues that the literature all together may have emphasized the positive productivity results more than the negative ones.

with more than 50 employees belonging to the Industrial Employers Confederation of the province of Brescia; 3) a longitudinal balance sheet data-set relative to both samples of firms. The questionnaire ⁸ were sent to a stratified sample of 380 firms located in Bergamo and to a stratified sample of 290 firms located in Brescia. The response rate was respectively 24 and 28 percent, implying a sample of 87 firms located in the province of Bergamo and 78 located in the province of Brescia. For the empirical analysis we combine these two samples given that the questionnaires are identical in the sections of interest and that the two surveys were conducted in parallel and followed by the same team of researchers. The final sample contains 165 firms, representing 16% of the firm population with more than 50 employees recorded in the last Industry Census conducted in 2001 (Table ??). The main sections of the questionnaire are based on WERS and include complete information on teamworking, industrial relations, hiring and selection procedures, extent and quality of training, consultation, information sharing and incentive pay systems; detailed data on firm characteristics (size, sector, market share, etc) at plant level are also included.

The questionnaires was jointly designed by a team of Department of Economics of the University of Bergamo⁹ and the Bergamo Personnel Managers Association (DIPER) whose collaboration had been essential both in helping formulating the questions in a management comprehensible language and in advocating the relevance of the survey among the firms¹⁰. The panel information on accounting data (value added, capital

⁸An English version of the questionnaires is available upon request from the authors.

⁹Leoni (ed.) (2008) provides a full account of the whole project, substantially financed by the Ministry of University and Research (PRIN, 2001), which took care of the various steps of the surveys. The first wave, in 1999, was addressed to the employers of the firms located in the provinces of Bergamo; the second wave, in 2003, was again addressed to the employers of the firms located in Bergamo and, in addition, to the Unions' representatives of the same firms (Leoni et al, 2001 and Leoni et al., 2003). In 2003 the survey was extended to the confining province of Brescia and was here addressed to the employers (Albertini and Paloia, 2008); Albertini and Leoni, (2008). Econometric analysis on the first wave are in Leoni (2008), Cristini et al. (2004) and Cristini and Leoni (2008).

¹⁰The surveys were proceeded also by a series of conferences mainly addressed to the employers and were followed by a conference in which the results and the Report were presented. A recent volume by Albertini and Leoni (2008) compares the findings of the surveys in the two provinces.

stock, accumulation rate, leverage and profits) is drawn either directly from the Balance Sheets Collector (Centrale dei Bilanci di Torino) or from a huge database of accounts, balance sheet ratios and activities at company level for Italy (AIDA), available from Bureau Van Dyck. For comparability with the cross-section financial performance information available for the British sample, we use only information of the accounting year in which the survey was conducted. One inevitable disadvantage of using balance sheets data is that financial information may not match plant level practices if firms are multi-plant; in our sample almost 60% of firms are mono-plant and in the regression analysis we take care of this by a suitable dummy variable..

For the UK we use the WERS 2004 which is nationally representative survey of workplaces with five or more employees. WERS Management Questionnaire provides data on workplace practices and subjective measures of performance, while the Financial performance questionnaire provides objective measures on the performance of individual establishments for the accounting year 2003. The latter is a four page questionnaire that was issued to all workplaces at the end of the cross-section Management interview¹¹. Although respondents were encouraged to complete the additional questionnaire solely about the workplace that had been the subject of the management interview, they were given the option to report on some larger observational unit, typically, the whole enterprise. About 90% of the manufacturing sector workplaces completed the financial questionnaire with reference only to the WERS workplace; as for the Italian sample, we take care of this in the regression analysis by a dummy variable. The alternative to the Financial questionnaire is to rely on the subjective measures about the establishment performance relative to average performance in the

¹¹The Financial performance questionnaires were distributed in 2076 of the 2295 workplaces that participated in the cross-section survey (Chaplin et al., 2005). Following a three-stage reminder process, Financial performance questionnaires were obtained for 1070 workplaces, representing a response rate of 52% among workplaces accepting placement of the questionnaire and a rate of 47% among all cross-section workplaces.

industry; this information is present in the Management questionnaire¹². T. Kersley et al. (2006) undertake a careful comparison of the subjective and accounting-based productivity measures for the private sector in WERS 2004 and find that the correlations between the two measures are modest. Hence we decided to use both the objective and the subjective measures in the econometric analysis.

On the whole, the usable sample of workplaces in the private manufacturing sector for which information on objective financial performance is also available is of 161 observations (123 if we consider only workplaces with more than 50 employees).

4.1 A description of the samples

In line with the population distribution by sector, almost 40% of the firms in the Italian sample belongs to the metal and machinery sector, 14% to the textile sector and 12% to the chemical sector (Table ??). The sector distribution of the British firms is quite different: the presence in the metal and machinery sector is below 10% and the presence in the textile sector is around 3%. British establishments are prevalently in the chemical and food sectors (each absorbing 15% of the establishments) and in the wood and paper sector (12%).

Regarding firms' size, though the Italian survey excludes companies below 50 employees, the sample is still predominantly of small-medium size, 67% of the firms having between 50 and 250 employees; in fact this is an even lower percentage than that of the 2001 Census for the two provinces of interest (85%). The pervasive presence of small firms in Italy is well known: according to the 2001 Census 99% of the manufacturing firms had less than 250 employees and accounted for 77% of the manufacturing

¹²The responses, given on a Likert scale: "A lot better than average" "Better than average" "About average" "Below average" or a "A lot below average, are skewed towards positive values, as usually the case in this type of qualitative questions. In the estimation sample, for example, only 9 percent of managers rates the financial performance at their workplaces to be "a lot below" or "below average", whereas 40 per cent rates it as "average", 53 per cent rates it "above average" and 13 per cent rates it "a lot above average"

workforce¹³. In the British sample, 25% of the establishments are below 50 employees (Table ??)¹⁴; this implies that, if we had to include only establishments with more than 50 employees, coherently with the Italian sample, the average size of the British establishments would be much larger than that of the Italian firms: more than 50% of the establishments have more than 250 employees in the British sample compared with 30% in the Italian sample. The distribution by size of the two samples is more similar if we consider all British establishments, including those with less than 50 employees. In the empirical section we presents estimations for all British establishments as well as for the subsample with more than 50 employees.

Table 3 reports summary statistics of the accounting data. Italian firms are smaller in terms of employees, sales, VA and capital; the average firm has 318 (461) employees in Italy (Britain) and a turnover (nominal sales) of 109000 (125000). VA per employee is also lower in the Italian sample, being on average 85% of that of the British sample¹⁵.

4.2 Market competition and firm ownership: sample information.

The questionnaire addressed the Italian firms differ slightly between the two provinces. In particular, firms located in the province of Brescia were asked o answer a set of additional questions concerning the corporate governance whereas firms located in the province of Bergamo were asked additional questions concerning the degree of competitiveness of their market of operation. We discuss both features below and compare

¹³To take account of the over-representation of large firms in our sample, we use weighted regression analysis, the weights being the inverse of the firm size, defined by number of employees.

¹⁴Notice that, for the sake of comparability with the descriptive statistics of the Italian sample, the reported descriptive statistics for the British sample are unweighted. In the econometric analysis, however, we take account of the complex sample design used for WERS04, which involved disproportionate stratified sampling by workplace size and industry sector, by using the sampling weights provided in the data set; these weights being approximately equal to the inverse of the probability of selection of each establishment into the sample. For a straightforward discussion of the importance of accounting for the sample design in analysis of WERS data, see Purdon and Pickering 2001.

¹⁵In both sample we have excluded firms with values of capital stock above the 99th percentile

them with similar information present in WERS.

Firms located in the province of Brescia are, according to the sample, predominantly owned by individuals: in 60% of the cases the first shareholder is an Italian individual, in 24% of the cases is an Italian private industrial firms, in 4% of the cases it is a foreign industrial firms. Ownership is also particularly concentrated: in 80% of the cases the first shareholder controls more than 30% of the equity and in most cases the first five shareholders own the whole firm. Coalitions are also rather stable in time. Typically, ownership and control overlap: in 77% of the cases the first shareholder takes active part in the firm's activity and the percentages are similar for all the first five shareholders. Regarding the role of the family, in 80% of the cases the owner is also the CEO and in 62% of the cases family members perform managerial tasks; nonetheless, managers with no family links have recently increased and are present in 58% of the firms. Finally, in 41% of the firms the founder is the CEO, in 32% is one of the children to have the main responsibilities and in 6% is one of the nephews (Albertini and Paiola, 2006). Using a much larger sample of more than 3500 firms located in four regions of Italy (Veneto, Emilia Romagna, Abruzzo and Molise) Cucculelli and Micucci (2008) find a larger percentage of first generation firms: the CEO is the founder in 65% of the cases and is the heir in 23% of the cases (Cucculelli and Micucci, 2008 BdI).

Comparing the Brescia firms with the WERS manufacturing sample, the latter appears to have a less concentrated ownership and less overlapping of ownership and management: 40% of the WERS manufacturing establishments have a single individual or a family owning more than 50% of the equity and only in 64% of the cases are any of the controlling owners actively involved in day-to-day management activities. Foreign ownership is also more common in the UK, where 28% of the establishments are owned/controlled by a foreign company.

The features of extensive overlapping of ownership and management and the presence of second and third generations of family firms, together with stable coalitions, do not

bend, altogether, in favor of sharp organizational changes in Italy. The decisive internationalization and the less extensive relation between ownership and management could, instead, favor more diffused organisational innovations in Britain.

The questionnaire addressed to the firms located in the province of Bergamo included a few of the questions on market competition present in WERS. One direct question asks on the perceived degree of competition in the market in which the firm operates: 85% (28%) of the British (Italian) respondents feels it's very high and 5% (13%) thinks it is very low (Table ??). In terms of value of goods, the largest client of the Italian (British) firms has a share of over 50% in 32% (14%) of the cases and a share less than 5% in 3% (11%) of the cases. In both samples most of firms operate in the international markets but Italian firms operate comparatively more in the local and regional market. On the whole, it looks as if British establishments face a higher number of competitors.

5 Definition of workplace practices and their diffusion among firms

The precise definition of an innovative workplace practices necessarily involves some degree of arbitrariness (OECD 1999, Greenan and Mairesse 1999; Millward 2000; Cristini et al 2003); to reduce this risk and facilitate the comparison with the existing evidence for Britain, we follow the terminology adopted by Forth et al (2004) and Bryson et al (2005) and focus on three large sets of practices: task practices (defining how the work is done), individual support practices, designed to give employees the skills and the information needed to work in an involved manner; organisational support practices, aimed to secure and retain a stable and committed workplace¹⁶. In particular, task practices include:

¹⁶Appendix A reports a detailed list of questions extracted from the Italian and the British survey used to define these workplace practices.

i) team working, defined as whether at least 60% of employees in the largest occupational group work in formally designed team and team members jointly decide how the work is to be done;

ii) functional flexibility, defined as whether employees are actually requested to carry out tasks different from their official duty.

Individual support practice include:

iii) meetings between senior managers and the whole workforce taking place at least monthly and where at least 10% of time is given over to questions or contributions from employees;

iv) information disclosure, i.e. regular information from the management to employees or their representatives about the establishment's financial position, internal investment plans and staffing plans;

v) human relations training which may cover teamworking, communication or problem solving for the largest occupational group and in the last 12 months.

Organisational support practices include:

vi) financial participation schemes targeted to non-managerial employees in the last 12 months (employee share ownership scheme or profit- or performance related pay or formal evaluation to determine wage increases or premiums).

Table 4 provides an overview of the diffusion of such practices. Starting from the task practices, Italian firms prefer functional flexibility to teamworking while British firms make the opposite choice: only 22% use functional flexibility and 37% have their employees working in teams. In Italy teamworking involves, instead, only 11% of the firms and functional flexibility almost 32%. Information disclosure is largely diffused in both countries and is highest in Italy, being present in nearly 70% of the firms (60% in Britain). Human relation training, probably the most important individual support practice is the most diffused practice in Britain (62%) although the proportion

is considerably smaller in larger firms (51%). Maybe because of the small presence of teamworking, employer-employee meetings are rather diffused in Italy (35%), less so in Britain (18%). Finally, only a fifth of Italian firms offer some form of financial participation to their employees while such schemes are present in half of the British firms. On the whole, larger firms, in Britain, make less use of innovative workplace practices.

A first glance to the two countries then reveals that the difference is not so much in the magnitude of the practices adopted (the average number of practices is around 2 in both samples) as in the quality of the set of practices. In Britain the choice has been towards teamworking supported by human relations training and employees' financial participation¹⁷. In Italy firms seem to have chosen a 'softer' road to innovation based on sharing information, meetings and job rotation¹⁸.

Table ?? also reports a measure of skills¹⁹ and a measure of the quality of industrial relations²⁰; these additional measures, though not being proper workplace practices, are important 'adjuvant'. In terms of skills the Italian firms appear to be about 15% less equipped than the British firms. With regards to industrial relations..DA FINIRE.....

Table ?? presents the correlation matrix for the six workplace practices in the three samples: Italy, all British establishments and British establishments with more than 50 employees. In the Italian sample, the most used task practice, functional flexibility, is negatively correlated with all individual support practices (information disclosure, meetings and human relations training) while in Britain, functional flexibility is posi-

¹⁷Millwards and Forth (2004) on the basis of WERS (1998) also show a diffused adoption of teamworking but also of functional flexibility practices and problem-solving groups, all present in 30% to 50% of the establishments,

¹⁸Comparing the first wave conducted for the only province of Bergamo to this second wave, for the same sub-sample, it emerges that the diffusion of team working and financial participation is almost unchanged, while there is a slight increase in the diffusion of functional flexibility, up from 25%.

¹⁹This is a dummy taking the value of 1 if in the firm/establishment the share of managerial and professional occupations is above the median and the share of manual skills is below the median.

²⁰This is a dummy taking a value of 1 if the respondent agrees on the statement that employee representatives generally help to find the best ways to improve company performance.

tively correlated to the most important individual supports: human relation training and meetings. However, the more 'employee-involving' task practice, teamworking, is positively related to training and information disclosure, in both countries. Financial participation is negatively related to both task practices in Britain and appears jointly with training and information disclosure; in Italy it is negatively related to all practices, except functional flexibility²¹. Next we turn to the multivariate analysis.

6 Econometric issues

We assume a standard Cobb Douglas production function where:

$$\log(Y_i) = \text{constant} + \mathbf{a}\mathbf{X}_i + b\log(H_i) + c\log(K_i) + \mathbf{d}\mathbf{Z}_i + eI_i + \varepsilon_i \quad (1)$$

The subscript i refers to the firm or establishment; Y is the firm's 2003 objective VA in euros, K is the 2003 book value of capital stock in euros, \mathbf{Z} is the vector of the six workplace practices described above, \mathbf{X} is the vector of controls including size, sector and region dummies, I is the 'good industrial relations' dummy variable, H is a skill-augmented labour input defined as follows: $H_i = e^{\gamma \text{hsk}_i} N_i$ where hsk_j is the high skill dummy previously defined and N_j is the number of employees. The production function is estimated as a cross section because for the British sample VA and capital are available only for the accounting year 2003.²²

The estimation of equation (1) presents some well-known problems that are likely to

²¹One reading of the correlations is the following: in Britain training is pivotal (and indeed it is positively and significantly related to all practices): financial participation is through training which in turn is linked to the most used task practice, teamworking; in Italy, financial participation is directly linked to the most used task practice, functional flexibility, but it is negatively related to training and teamworking

²²See for example Black and Lynch (1999) for a similar cross-section production function using workplace practices as regressors.

bias the coefficients of the explanatory variables: possible correlations between the unobservable time invariant part of the error term and the regressors; errors in the measurement of some variable and particularly of capital; simultaneity between the choice of inputs and output determination; possible underestimation of the true impact of workplace practices as long as their productivity effect takes some time to come through. We will therefore interpret the estimates of the effects of workplace practices on establishment performance as statistical correlations that give some guidance on the true causal effect but we will be careful to draw policy conclusions. In order to check if the potential bias on the coefficients of labour and capital affect the estimation of the effects of practices, we also run regressions on the total factor productivity (TFP) calculated by inputting 'standard' values to the coefficients of capital and labour²³. As an alternative measure of performance we compute an indicator of each firm's average labour productivity relative to the industry average. In this case the ordinal nature of the dependent variable leads us to employ the standard ordered probit model:

$$Q_i = \mathbf{G}_i\beta + u_i \quad I_i = m \quad \text{if} \quad m \leq I_i \leq m + 1 \quad (2)$$

where Q_i is an indicator of relative productivity of firm i calculated as either relative value added per head or relative sales per head, m are the industry specific quartiles of the distribution of either value added per head or sales per head and \mathbf{G}_i are the same set of regressors of equation (1). For the British sample, we also use, in alternative to Q , the subjective measure of labour productivity reported in the management questionnaire.

²³The total factor productivity is calculated as following: $\ln(\text{TFP})_i = y_i - 0.65 * n_i - 0.35 * k_i$.

7 Empirical evidence

Table ?? reports the results of estimating equation (1) for the Italian sample and the British samples (all establishments and more than 50 employees)²⁴. In Model 1, the dependent variable is VA and in Model 2 it is TFP, calibrated as previously described. For Italy the estimated coefficients of K and N are very close to the conventional shares in value added; for Britain, though not as satisfactory, they are also reasonably close to their expected values if the whole sample of establishments is used. In fact, when limiting the analysis to the British establishments with more than 50 employees, none of the workplace practices is significant and the estimates of the inputs' shares are far from their expected magnitudes; still, even when calibrating the TFP, workplace practices remain totally insignificant. In what follows we therefore focus, for the British sample, on the results obtained on the whole sample of establishments.

Functional flexibility has a positive and strongly significant effect on the performance of both sample of firms, Italian and British, and it is robust to both definitions of the dependent variable. Likewise, human relation training shows a coefficient that is consistent across samples and models but its impact is negative suggesting that, at least on the contemporaneous VA and TFP, it counts more as an expense than as a resource. Teamworking is a strongly significant and productivity enhancing task practice for the Italian firms for which both task practices are therefore relevant. On the contrary, teamworking has a negative effect, though far from being statistically significant, for the productivity of the British firms. For the latter, financial participation exerts a large and positive effect both on VA and on TFP. Finally, good industrial relations raise TFP for the British firms; it has a positive but not significant effect for the Ital-

²⁴Stratification is accounted for in all regressions. By using subsample a situation in which some strata are represented by just one workplace are possible and are remedied by identifying these single strata and combining each of them with its closest neighbouring stratum. The impact of the sample design on standard errors is accounted for by the use of a linearised variance estimator (Bryson et al 2005).

ian firms ²⁵.

All the results described above are confirmed when using the relative performance indicator as dependent variable (Table ??). However, the subjective measure of performance, directly taken from WERS, gives less precise and in some cases opposite results, specially when using the whole sample of establishments. On the other hand, the subsample of establishments with more than 50 employees confirms some of the previous findings on the whole sample: a positive and significant role of financial participation, a negative and significant effect of meetings, a positive effect of functional flexibility and a negative effect of training although these latter two coefficients are not significant at conventional levels²⁶.

7.1 The productivity gap and workplace practices: a counter-factual analysis

In Italy, a flattening of the labour productivity in manufacturing dates back to the beginning of the decade 2000; in the same period and up at least to 2004, the level of labour productivity in the UK manufacturing sector followed an upward trend, diverging from Italy and the Euro average. From 2000 to 2003, labour productivity

²⁵For Italy, the existing evidence is only based on local surveys covering some areas of Lombardy and Emilia-Romagna (see for example Colombo and del Mastro (2000), Pini (2004) and Cainelli et al (2001). Although the definition of workplace practices is a little different, econometric results from the first wave of the survey for Bergamo, found that most workplace practices increased productivity only if industrial relations were good and the organizational structure relatively flat (Cristini, Gay, Labory and Leoni (2003)).

²⁶Previous results from the UK found that the labour productivity effects of the practices, if estimated using national representative data, are overall, rather limited: Wood and Menezes, 1998 and de Menezes et al. (2001) find little association between systems of involvement practices, at various degrees, and subjective measures of labour productivity; similarly Bryson et al (2005), using WERS (1998), find that high-involvement practices have a positive impact on a subjective measure of labour productivity but this effect is confined to unionized workplaces and is not at all significant on a subjective measure of financial performance. On the other hand, studies using specific samples do find a positive association between workplace practices and either subjective ratings of labour productivity (Hoque, 1999; Guest et al., 2003; Guest and Hoque, 1994) or quantitative measure of productivity growth (Patterson et al, 1997). This could suggest that productivity effects might depend on specific firm characteristics or specific bundles of practices which are hard to pin down at the economy level.

in manufacturing showed virtually zero growth in Italy (0.1%) while it grew at 3.4% on average per year in the UK (OECD Statistical database, 2007). Consistently with this macro view, our sample of Italian firms shows a significantly lower average VA per employee, relative to the British sample, as reported in Table ??.

How much of this difference is explained by the different extent and composition of the innovative workplace practices adopted in the two countries and how much is it explained by the different efficacy of the adopted workplace practices? To answer this question we compare the average predicted (log) VA (and TFP) of the Italian establishments with that of the British ones and apply an Oaxaca-type decomposition method to to quantify the relative role of two components: the differences in the establishment characteristics (endowment or variable effect) and the differences in the estimated coefficients (coefficient effect). Taking Italy as reference, the difference in the average predicted log VA (TFP) between the British establishments and the Italian ones can be decomposed as follows:

$$(\hat{y}_{uk} - \hat{y}_{ita}) = [(\bar{x}_{uk} - \bar{x}_{ita}) \hat{\beta}_{uk}] + [(\hat{\beta}_{uk} - \hat{\beta}_{ita}) \bar{x}_{ita}] \quad (3)$$

The first term in brackets in equation ?? measures the contribution of the difference in establishment characteristics to the difference in the average predicted value added (i.e. variable effect). The second term indicates the difference in the average value added due to differences in estimated coefficients (i.e. coefficient effect). Table ?? reports the Oaxaca decomposition, based on the regression results of Table ?. The first panel uses the results for log VA, the second the results for TFP; in this case we also present the detailed contribution of each practice. In the first (second) panel, the diagonal elements of the first two rows are the average predicted log VA (TFP) using establishment characteristics and estimated coefficients associated to the same country; the columns give the effect of changing the establishment characteristics and

the rows report the effect of changing the estimated coefficients. The difference in the average predicted VA between the British and the Italian samples is 25% and the difference in the predicted TFP is 13%. The large role of the magnitude of the variables in explaining differences in VA is likely to be driven by the firm's size, both in terms of employment and capital. Instead, by looking at the TFP difference, we keep constant the size and the effect of K and N and analyse the sole role of workplace practices, skills and industrial relations. In this case, we find that the contribution of the endowments to the total difference in the predicted TFP, drops to 40% and the remaining 60% is due to the different effect or efficacy of the explanatory variables. The final panel shows the contribution of each variable. Information disclosure, which is the most diffused practice in both samples, is more effective for the British firms; functional flexibility and financial participation also contribute to explain the 'coefficient effect' in favor of Britain but it is the difference efficacy of good industrial relations that mostly contribute to the overall coefficient effect. Financial participation largely contributes to explain the difference in terms of endowment and, similarly, meetings although their efficacy favors the Italian sample. Finally, the difference in skills brings a positive but relatively small contribution to both the endowment and the coefficient effect. Figure 1a illustrates the kernel densities of the predicted TFP for the Italian and the British establishments; the other figures in the panel represent the predicted TFP of the Italian establishments when they are attributed the characteristics of the British establishments (Figure 1b) and when they are attributed the efficacy of the British establishments. The TFP distribution of the Italian firms moves rightwards in both cases²⁷. By assigning the British sample's endowment, the distribution of the TFP rises in mean but also in variance: all the distribution moves to the right implying that both bad and good performing firms would benefit from the different endowment.

²⁷In both cases the counterfactual distribution is significantly different from the initial predicted one according to a Kolmogorov test (p.value 0.00)

By assigning the coefficients of the British sample to the Italian firms, which can be interpreted as moving the Italian firms in the British context, the variance of the distribution rises less (DARIO INSERISCI SE CREDI UTILE; MEDIE e VARIANZE DELLE DISTRIBUZIONI), the left tail is trimmed only a little while the right hand side tail becomes fatter indicating that the best performing firms are those that would gain more from a change of the context: the best firms would do even better²⁸.

7.2 The progression of the reorganization process and its effect on the firm's performance

In the regression analysis we have not attempt to interact workplace practices, mainly for the small number of observations in our samples. In fact, it is well documented that practices, when forming complementary bundles, can exert a larger effect on productivity ²⁹. It has also been suggested (Freeman et al. (2000)) that practices may be adopted along an ideally sequential path where the easiest practices are the first ones to be introduced, gradually followed by the more difficult ones. In this case, the bundle of practices, at a point in time, would be indicative of how far, along the reorganization path, has the firm proceeded. In what follows we exploit this idea. First of all, we check to what extent the data on the diffusion of workplace practices confirm a sort of sequential path, i.e. we test whether the most diffused practices are indeed the easiest and the least diffused are the most difficult ones; secondly, we compute, for each firm, a measure of the of the reorganization process and use this as a regressor in the production function.

In order to investigate whether the most widely adopted workplace practices are also

²⁸Kernel densities of analogous predicted values using VA are qualitatively similar although the distribution of VA in the British sample is less compressed. Moreover, kernel densities by subsections (region and sector) do not show a significantly different results across sub-samples

²⁹For the evidence see, for example: Ichniowski, Shaw and Prennushi (1997), Brynjolfsson et al. (2002); Breshnan et al. (2002); for the theoretical production function see: Milgrom and Roberts (1990)

the easiest to adopt we apply the Rasch analysis. This belongs to the so called "unidimensional latent trait models" largely applied in education to assess the ability of a person in response to a set of questions. In this case the latent variable we want to measure is the reorganisation process and we measure it along an ideal continuum; this means that the more difficult is the adoption of a given practice, the further away this practice will be placed along the reorganization path and the more its adoption will be retarded in comparison to easier practices.

More formally, let y_{ij} be the binary response to whether the practice is adopted or not, where $i = 1, \dots, n$ with n the number of the establishments and $j = 1, \dots, m$, with m the number of practices. The Rasch model can be written as a logit-linear model:

$$\log \text{it Pr}(y_{ij} = 1 | \alpha_i) = \alpha_i - \theta_j \quad (4)$$

here α_i can be interpreted as an unobserved firm ability to innovate and θ_j as an item-difficulty parameter. It is assumed that conditional on α_i , the y_{i*} are independent (local independence). Actually Rasch (1960) gave an axiomatic derivation of the model in which next to local independence, the main characterizing properties were that the y_{*j} and y_{i*} form a sufficient statistic for α_i θ_j . Andersen (1980) showed that the conditional maximum likelihood estimator of θ_j , where conditioning occurs on the subject's score y_{i*} , is efficient and is actually asymptotically normal distributed, with all the nice properties of ml properties analogous to those of the standard likelihood-ratio test.

We estimate equation (2) using both the conditional fixed effects and the random effects estimators. Results are given in Table ???. The estimates obtained assuming that θ_j are fixed or random effects indicate the same order of the items. For the British sample with more than 50 employees the order of the practices, from the most diffused to least, is the same order resulting from the estimated coefficients confirming that the

most frequently adopted practice, i.e. information disclosure, in this case, is also the "easiest"; likewise, functional flexibility is the least frequently adopted practice and the most difficult to adopt. For the whole sample of establishments, this correspondence is less precise: the easiest practice is again information disclosure but human relation training is the most diffused; functional flexibility is the least diffused but still easier than meetings. For the Italian sample the correspondence is also confirmed: teamworking is the most difficult practice and information disclosure is the easiest³⁰.

Since the Rasch measure is unidimensional, the estimated coefficients indicate the position of each practice along an ideal continuum (the reorganization process). The position of the practices along such a 'reorganization-meter' indicates that for the Italian firms the most difficult change is to go beyond the first practice (information disclosure), in the sense that the increase in the difficulty is highest in this step; for the British firms the most difficult step is to introduce teamworking.

We decide to use the practice difficulty parameters obtained from the Rasch analysis as weights of a count weighted measure that adds up each of the practices. With respect to the raw count variable, which identify the number of practice adopted ("quantity"), the weighted one should capture, more properly, the progression of the reorganization process, accounting more weight to the practices more advanced along the reorganization path. It is not clear, a priori, if the firm's performance is linearly linked to the progression of the reorganization process or if the relation is non-linear involving an initial decrease, in correspondence, for example, with the initial expenses and a still insufficient complementary bundle of practices.

We estimate an equation like (1) where Z is now a vector including the count of the

³⁰We ran Hausman specification test to investigate whether the difficulty parameters are the same for the "the most innovative" firms and the "least innovative" firms, distinguished via their total number of practices. By comparing the theta estimates obtained from the full sample with the theta estimates obtained from the "most innovative" firms, i.e. those adopting more than two practices or "least innovative" firms, i.e. those adopting less than two practices, we conclude that the difficulty of items does not differ across the sub-samples. Results are available on request from the authors.

practices, the linear measure of the progression of the reorganization progression (the weighted count described above) and its squared term. Results are presented in Table ??.

VA rises linearly with the progression of the reorganization in the Italian sample but in the British sample the relation is non linear. In particular for the whole sample of British establishments, the reorganization process initially lowers VA and starts exerting a positive impact for values of the indicator greater than 2.9 ..SAY MORE HERE FROM THE DISTRIBUTION OF THE INDICATOR: A QUANTILE PERCENTILE CORRESPONDE???.The results for the subsample of establishments with more than 50 employees show a similar non linearity but are less reliable both in terms of the variance explained and because of the large upward bias of the coefficient of employment.

8 Conclusions

Using data from the 2004 Workplace Employee Relations Survey on British establishments and two comparable surveys on manufacturing firms located in the North of Italy, this paper contrasts the adoption of workplace practices in the manufacturing private sectors of the two countries and looks at the impact of new workplace practices on objective measures of financial performance. Our main results are summarizable in the following points: (i) the average incidence of the innovation practices in the Italian and British sample is very similar; on average each firm has adopted two innovative practices; the main difference between the two countries is in terms of the composition of the set of workplace practices. Italian firms privilege functional flexibility (job rotation), information sharing and meetings while British firms have opened to teamworking, human relation training and employees' financial participation. (ii) Regardless the different diffusion, the statistical associations between practices and the firm's performance shows some features that are robust across countries: functional

flexibility is positively related to VA, TFP and to a relative performance measure; human relation training is negatively related to any of the (contemporaneous) measures of firm performance. On the contrary, the effect of financial participation is positive and significant only in the British sample and the effect of teamworking is positive and significant only in the Italian sample. (iii) Could the Italian firms operate in the British context, their TFP would rise by 8%, on average; were they given the same endowments of the British establishments, in terms of skills, industrial relations and workplace practices, their TFP would raise, on average by 5%. (iv) When regarded as parts of a whole reorganization process, workplace practices can be used to measure the progression of such reorganization. Borrowing from psicometry, we attempted to 'measure' the progression of the reorganization process, separately for the Italian and the British sample, by using the Rasch approach. We find that as reorganization advances, the performance of the Italian firms improves linearly whereas the relationship between reorganization and firms' performance is non linear in the British sample; in this case the reorganization improves performance once it has progressed sufficiently but not at its initial stage.

A Appendix: Questions used to defined workplace practices in the Italian and WERS 2004 survey

1. Team working (Italy): 1) "What proportion of employees work in groups (teams, project teams, continuous improvement teams, etc.) formally set up? All (100%); Almost all (80-90%); Most (60-79%); About half (40-59%); Few (1-19%); None (0%)" ; 2) "The team members decide together how to do the work? Yes; No";
2. Team working (WERS): 1) "What proportion, if any, of the largest occupational group at this workplace work in formally designated teams? All (100%); Almost all (80-90%); Most (60-79%); About half (40-59%); Few (1-19%); None (0%)" ; 2) "Which, if any, of the following statements apply to the way that team working operates among at this workplace.... team members jointly decide how the work is to be done? Yes; No";
3. Functional flexibility (Italy): 1) Employees are frequently requested to carry out tasks different from their official duty? Mostly agree; agree; neither agree nor disagree; disagree; mostly disagree";
4. Functional flexibility (WERS): 1) What proportion of largest occupational group actually do jobs other than their own at least once a week? All (100%); Almost all (80-90%); Most (60-79%); About half (40-59%); Few (1-19%); None (0%)" ;
5. Meetings (Italy): 1) "Do you have meetings between senior managers and the employees? Yes, No"; 2) "During meetings of heads with their collaborators, what proportion of time is dedicated to questions raised or suggestions made by collaborators? None; A small part; up to 25%, More than 25%";
6. Meetings (WERS): 1) "Do you have meetings between senior managers and the whole workforce (either altogether or group by group)? Yes; No"; 2) "On average,

- what proportion of the time at the meetings is usually available for questions from employees, or for employees to offer their views? None; A small part; up to 25%, More than 25%”
7. Information disclosure (Italy): 1) ”Does the top management regularly provides information to employees on investment programmes? Yes; No”; 2) ”Does the top management regularly provides information to employees on economic performance of the company? Yes; No”;
 8. Information disclosure (WERS): 1) ”Does management regularly give employees, or their representatives, any information about internal investment plans? Yes; No”; 2) ”Does management regularly give employees, or their representatives, any information about the financial position of the establishment? Yes; No”;
 9. Human relations training (Italy): 1) ”In the last 12 months have experienced members of the largest occupational received off the job training covering team work, interpersonal relationships and communication or problem solving methods? Yes; No”;
 10. Human relations training (Italy): 1) ”In the last 12 months have experienced members of the largest occupational received off the job training covering team-working, communication skills or problem solving methods? Yes; No”;
 11. Financial participation (Italy): 1) ”What is the share of employees who are subject periodically to formal evaluation?all (100%); Almost all (80-90%) Most (60-79%); About half (40-59%); Few (1-19%); None (0%); 2) ”Is the objective of evaluation to determine wage increases or premiums? Yes; No”
 12. Financial participation (Italy): 1) ”What proportion of non-managerial employees at this workplace are eligible for the employee share ownership scheme(s)? all (100%); Almost all (80-90%) Most (60-79%); About half (40-59%); Few (1-19%);

None (0%); 2) "What proportion of non-managerial employees at this workplace receive profit or performance related pay? all (100%); Almost all (80-90%) Most (60-79%); About half (40-59%); Few (1-19%); None (0%)"

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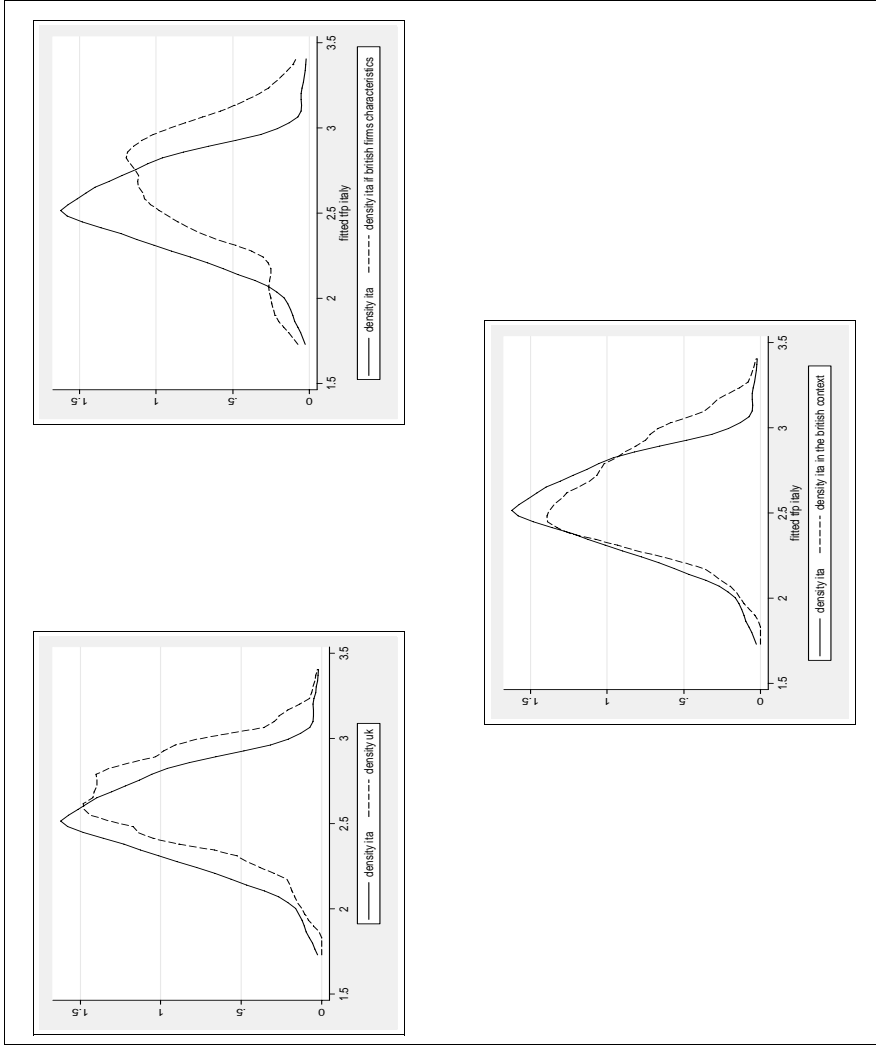


Figure 1: Kernel density of the predicted TFP for Italian and British firms and their counterfactuals.

Table 1: Distribution by size and sector of firms located in the provinces of Bergamo and Brescia: 2001 Census versus *sample*.

	Food	Textile	Wood-Pap	Chemicals	Metal-Mach	Other	Class size total
50-99							
nr. firms	22	71	29	83	318	17	573
percent							50
row percent	3,8	12,4	5,1	14,5	55,5	8,7	100,0
	4,0	14,0	0,0	16,0	32,0	34,0	100,0
100-199							
nr. firms	7	51	12	37	130	34	271
percent							48
row percent	2,6	18,8	4,4	13,7	48,0	12,5	100,0
	0,0	22,9	4,2	10,4	37,5	25,0	100,0
200-249							
nr. firms	3	8	1	4	25	6	47
percent							13
row percent	6,4	17,0	2,1	8,5	53,2	12,8	100,0
	0,0	23,1	7,7	0,0	30,8	38,5	100,0
250-499							
nr. firms	3	13	3	7	47	9	82
percent							27
row percent	3,7	15,9	3,7	8,5	57,3	11,0	100,0
	0,0	3,7	0,0	11,1	51,9	33,3	100,0
≥ 500							
nr. firms	0	13	4	8	8	50	83
percent							23
row percent	0,0	15,7	4,8	9,6	47,8	60,2	100,0
	4,3	8,7	0,0	17,4	21,7	21,7	100,0
Sector total							
nr. firms	35	156	49	139	528	149	1056
percent							165
row percent	3,3	14,8	4,6	13,2	50,0	14,1	100,0
	1,8	13,9	1,8	12,1	38,8	30,9	100,0

Table 2: Distribution by size and sector of British establishments in the sample.

	Food	Textile	Wood-Pap	Chemicals	Metal-Mach	Other	Size class total
0-49							
nr.est	3	2	6	3	4	21	39
percent							25.32
row percent	7.69	5.13	15.38	7.69	10.26	53.85	100.00
50-99							
nr.est	2	0	3	5	3	7	20
percent							12.99
row percent	10.00	0.00	15.00	25.00	15.00	35.00	100.00
100-199							
nr.est	6	1	2	8	2	12	31
percent							20.13
row percent	19.35	3.23	6.45	25.81	6.45	38.71	100.00
200-249							
nr.est	2	0	1	0	0	2	5
percent							3.25
row percent	40.00	0.00	20.00	0.00	0.00	40.00	100.00
250-499							
nr.est	5	2	4	5	1	12	29
percent							18.83
row percent	17.24	6.90	13.79	17.24	3.45	41.38	100.00
≥ 500							
nr.est	5	0	3	2	3	17	30
percent							19.48
row percent	16.67	0.00	10.00	6.67	10.00	56.67	100.00
Sector total							
nr.est	23	5	19	23	13	71	154
percent	14.94	3.25	12.34	14.94	8.44	46.10	100.00

Notes: Source, Workplace Relations Survey 2004.

Table 3: Some indicators of competitiveness in the UK and Italy.

	UK	Italy
Where is the market for your product or service?		
local	5.44	10.86
regional	13.61	19.58
national	40.14	32.62
international	40.82	36.95
Total	100	100
Largest customer in terms of the value of goods?		
less than 5%	10.79	3.41
5-10%	18.71	14.77
11-25%	30.22	20.45
26-50%	26.62	29.55
more than 50%	13.67	31.82
Total	100	100
How would you assess the degree of competition in this market?		
Very high	85.52	28.09
Neither high nor low	8.97	55.06
Low	5.52	16.85
Total	100	100

Notes: Source, Workplace Relations Survey 2004.

Table 4: Summary statistics: Italy and Britain.

Variables:	Italy						Britain all						Britain ≥ 50							
	obs	mean	s.d.	min	max	obs	mean	s.d.	min	max	obs	mean	s.d.	min	max	obs	mean	s.d.	min	max
Average nr. employees	161	318.0	600.7	21.0	4342.8	126	460.6	736.3	4.4	4467	102	563.1	784.3	50.4	4467					
Value added*	145	33154.8	154927.3	40.9	1791044.0	1126	47545.3	118759.5	200	729306.2	102	54843.8	126101.3	1096.3	729306.2					
Sales*	147	108758.3	400917.8	0.0	4284702.0	126	125354.4	353468.4	450.7	3112593.0	102	150702.1	387243.7	2375.4	3112593.0					
Capital*	145	40625.1	238480.4	0.0	2832450.0	131	30055.99	79182.2	5.8	759182.6	112	34655.6	84784.6	53.6	759182.6					
Value added per employee*	141	67.0	73.1	0.3	635.1	125	79.2	136.3	7.8	1307.2	102	85.4	149.3	7.8	1307.2					
High skill dummy	165	0.21	0.41	0	1	154	0.25	0.44	0	1	130	0.26	0.44	0	1					
Subjective lab prod						141	2.40	0.78	1	4	122	2.38	0.80	1	4					

Notes: Source, Workplace Relations Survey 2004 and Italian sample, 2003. * Nominal values in thousands of euros

Table 5: Incidence of workplace practices in manufacturing firms, Britain 2004 (weighted percentages) and Italy 2003.

	Italy	Britain	
		all	≥ 50
Task practices			
Team	10.9	37.2	29.9
Functional Flexibility	31.5	22.3	13.4
Individual supports			
Meetings	35.1	17.9	19.7
Information disclosure	69.7	58.3	59.9
Human relations training	35.1	62.0	51.0
Organisational supports			
Financial participation	21.8	50.0	43.9
Number of adopted practices	2.0	2.2	2.4
High skill dummy	0.21	0.25	0.26
Good industrial relation dummy

Notes: Source for British data, Workplace Relations Survey 2004 and Italian sample, 2003.

Table 6: Correlation matrix for workplace practices, Britain 2004 and Italy 2003.

Italy						
	1	2	3	4	5	6
Information disclosure	1					
Functional flexibility	-0.092*	1				
Meetings	0.099*	-0.035	1			
Human relations training	0.184*	-0.092*	0.067*	1		
Financial participation	-0.0005	0.081*	-0.023	-0.146*	1	
Team working	0.188*	-0.028	-0.013	0.189*	-0.092*	1
Britain all						
	1	2	3	4	5	6
Information disclosure	1					
functionalf	-0.098*	1				
Meetings	-0.011	0.099*	1			
Human relations training	0.170*	0.014	0.176*	1		
Financial participation	0.180*	-0.130*	-0.066*	0.158*	1	
Team working	0.044	0.154*	0.121*	0.133*	-0.103*	1
Britain ≥ 50						
	1	2	3	4	5	6
Information disclosure	1					
functionalf	-0.091*	1				
Meetings	-0.044	0.085*	1			
Human relations training	0.128*	0.082*	0.254*	1		
Financial participation	0.220*	-0.061*	-0.006	0.096*	1	
Team working	0.053	0.099*	0.073*	0.175*	-0.084*	1

Notes: ** Statistically significant at 0.05 level. Source for British data, Workplace Relations Survey 2004.

Table 7: The effects of workplace practices on firm performance.

	Italy		Britain all		Britain ≥ 50	
	Model1	Model2	Model1	Model2	Model1	Model2
ln K	0.35*** (0.02)		0.20*** (0.05)		0.15*** (0.07)	
ln N	0.67*** (0.09)		0.95*** (0.10)		1.08*** (0.15)	
High skilled	0.05 (0.12)	0.08 (0.11)	0.17 (0.13)	0.25** (0.12)	-0.12 (0.23)	-0.05 (0.22)
Team	0.25** (0.11)	0.29** (0.13)	-0.09 (0.14)	-0.15 (0.14)	-0.12 (0.19)	-0.08 (0.20)
Functional flexibility	0.19** (0.08)	0.25*** (0.09)	0.41*** (0.14)	0.37** (0.15)	-0.29 (0.30)	-0.22 (0.31)
Meetings	0.03 (0.10)	0.07 (0.10)	-0.36* (0.18)	-0.56** (0.22)	-0.11 (0.22)	-0.28 (0.25)
Information disclosure	-0.03 (0.11)	-0.05 (0.10)	0.17 (0.22)	0.22 (0.22)	0.32 (0.36)	0.34 (0.34)
Human relations training	-0.16* (0.09)	-0.25** (0.11)	-0.37** (0.14)	-0.31** (0.13)	-0.35 (0.21)	-0.37 (0.22)
Financial participation	0.004 (0.10)	-0.13 (0.14)	0.43*** (0.15)	0.39** (0.16)	0.32* (0.19)	0.23 (0.20)
Industrial relations	0.05 (0.09)	0.10 (0.11)	0.21 (0.17)	0.36** (0.17)	-0.18 (0.24)	-0.16 (0.25)
R sq.	0.95	0.29	0.92	0.48	0.73	0.31
N	132	132	113	113	89	89

Notes: For the Italian sample: i) all regressions include industry dummies and a dummy variable related to whether the firm is a mono-plant one; ii) estimates are obtained using weighted least squares, the weights being the inverse of the firm size, defined by the number of employees; iv) heteroschedastic consistent standard errors. For the British samples: i) all regressions include industry, regional dummies a dummy related to whether the accounting data were provided at site level; ii) estimates take account of the complex sample design. *Statistically significant at the .10 level, **at the .05 level, ***at the .01 level. Model1: dependent variable is the log of value added; Model2: dependent variable is the log of total factor productivity.

Table 8: The effects of the workplace practices on relative firm productivity compared with other firms in the same industry.

	Italy			Britain all			Britain ≥ 50		
	Model1	Model2	Model3	Model1	Model2	Model3	Model1	Model2	Model3
High skilled	-0.05 (0.33)	0.18 (0.34)	0.83** (0.40)	0.21 (0.45)	0.67* (0.34)	0.36 (0.50)	-0.46 (0.45)	0.02 (0.35)	
Team	0.44* (0.23)	0.22 (0.37)	-0.37 (0.38)	-0.30 (0.43)	0.13 (0.42)	-0.05 (0.36)	-0.03 (0.39)	0.20 (0.33)	
Functional flexibility	0.41* (0.23)	0.39* (0.22)	1.55*** (0.41)	2.31*** (0.43)	-0.64 (0.58)	-0.06 (0.62)	0.25 (0.65)	1.10 (0.72)	
Meetings	0.29 (0.26)	0.21 (0.27)	-0.97* (0.50)	-0.09 (0.36)	-0.29 (0.45)	-0.59 (0.50)	0.25 (0.38)	-1.14** (0.53)	
Information disclosure	0.00 (0.29)	0.03 (0.30)	0.60 (0.47)	0.25 (0.48)	-0.69* (0.35)	0.64 (0.62)	0.76 (0.54)	-0.23 (0.39)	
Human relations training	-0.50* (0.29)	-0.48* (0.27)	-0.97** (0.39)	-0.48 (0.37)	-0.22 (0.37)	-0.74* (0.39)	-0.30 (0.41)	-0.36 (0.43)	
Financial participation	-0.27 (0.26)	-0.19 (0.29)	1.02*** (0.38)	1.62*** (0.41)	-0.34 (0.34)	1.07*** (0.33)	0.70*** (0.32)	0.74** (0.33)	
Industrial relations	0.12 (0.26)	0.01 (0.28)	0.83** (0.36)	-0.39 (0.44)	0.67 (0.46)	-0.27 (0.38)	-0.45 (0.40)	-0.42 (0.33)	
N	132	132	113	113	102	89	89	82	

Notes: For the Italian sample: i) all regressions include industry dummies and a dummy variable related to whether the firm is a mono-plant one; ii) estimates are obtained using weighted least squares, the weights being the inverse of the firm size, defined by the number of employees; iv) heteroschedastic consistent standard errors. For the British samples: i) all regressions include industry, regional dummies a dummy related to whether the accounting data were provided at site level; ii) estimates take account of the complex sample design. *Statistically significant at the .10 level, **at the .05 level, ***at the .01 level. Model1: dependent variable is the relative value added per head; Model2: dependent variable is the relative sales per head; Model3: subjective productivity.

Table 9: Rasch model results: conditional fixed and random effects estimates. Sample of Italian firms.

Italy				
	Fixed effects		Random effects	
	Coeff	P-value	Coeff	P-value
Practice difficulty parameter				
Theta1	-	-	-0.88	0.00
Theta2	1.56	0.00	0.62	0.00
Theta3	1.51	0.00	0.57	0.001
Theta4	1.75	0.00	0.82	0.00
Theta5	2.16	0.00	1.23	0.00
Theta6	3.04	0.00	2.13	0.00
Britain all				
	Fixed effects		Random effects	
	Coeff	P-value	Coeff	P-value
Practice difficulty parameter				
Theta1	-	-	-0.04	0.81
Theta2	-0.38	0.103	-0.43	0.01
Theta3	0.31	0.199	0.26	0.13
Theta4	0.95	0.00	0.91	0.00
Theta5	2.02	0.00	1.97	0.00
Theta6	1.53	0.00	1.49	0.00
Britain ≥ 50				
	Fixed effects		Random effects	
	Coeff	P-value	Coeff	P-value
Practice difficulty parameter				
Theta1	-	-	-0.94	0.00
Theta2	0.46	0.10	-0.48	0.01
Theta3	0.93	0.00	-0.02	0.93
Theta4	1.93	0.00	0.99	0.00
Theta5	2.46	0.00	1.52	0.00
Theta6	3.32	0.00	2.39	0.00

Notes: In the Italian sample, Theta1 corresponds to information disclosure, Theta2 to meetings, Theta3 to human relations training, Theta4 to functional flexibility, Theta5 to financial participation, Theta6 to team. For Britain, all sample: Theta 1 corresponds to human relations training, Theta 2 to information disclosure, Theta 3 to financial participation, Theta 4 to teamworking, Theta 5 to functional flexibility and Theta 5 to meetings. For the British establishments with more than 50 employees, Theta1 corresponds to information disclosure, Theta2 to human relations training, Theta3 to financial participation, Theta4 to team, Theta5 to meetings, Theta6 to functional flexibility. Source for British data, Workplace Relations Survey 2004.

Table 10: The effects of the quality and the quantity of practices adopted on firm performance.

	Italy			Britain all			Britain ≥ 50		
	Model1	Model2	Model3	Model1	Model2	Model3	Model1	Model2	Model3
ln K	0.37*** (0.02)	0.36*** (0.02)	0.36*** (0.02)	0.14*** (0.05)	0.16*** (0.05)	0.15*** (0.05)	0.15* (0.09)	0.15 (0.09)	0.14* (0.08)
ln N	0.67*** (0.10)	0.68*** (0.09)	0.68*** (0.10)	0.96*** (0.12)	0.93*** (0.11)	0.95*** (0.11)	1.07*** (0.18)	1.04*** (0.17)	1.07*** (0.15)
High skilled	0.08 (0.12)	0.05 (0.12)	0.07 (0.12)	0.07 (0.15)	0.04 (0.15)	0.07 (0.16)	-0.08 (0.24)	-0.15 (0.24)	-0.14 (0.24)
Number of practices	-0.13 (0.10)	-0.10 (0.10)	-0.04 (0.13)	0.01 (0.10)	-0.02 (0.10)	-0.10 (0.09)	0.14 (0.17)	0.17 (0.17)	0.41** (0.17)
Quality of workplace innovation	0.11** (0.04)	0.10* (0.04)	0.08 (0.07)	-0.01 (0.07)	-0.29** (0.15)	-0.00 (0.08)	-0.18** (0.08)	-0.41** (0.18)	-0.40*** (0.13)
(Quality of workplace innovation) ²		0.01 (0.01)			0.10** (0.04)			0.04* (0.02)	
Number of practices* Industrial relations			-0.14 (0.18)			0.23 (0.19)			-0.54 (0.34)
Quality of workplace innovation*Industrial relations			0.03 (0.11)			-0.02 (0.15)			0.38** (0.17)
Industrial relations	0.02 (0.10)	0.04 (0.10)	0.22 (0.19)	0.28 (0.22)	0.22 (0.21)	-0.20 (0.47)	-0.12 (0.26)	-0.11 (0.26)	0.34 (0.67)
R sq.	0.95	0.95	0.96	0.89	0.90	0.90	0.71	0.72	0.73
N	132	132	132	113	113	113	89	89	89

Notes: For the Italian sample: i) all regressions include industry dummies and a dummy variable related to whether the firm is a mono-plant one; ii) estimates are obtained using weighted least squares, the weights being the inverse of the firm size, defined by the number of employees; iv) heteroschedastic consistent standard errors. For the British samples: i) all regressions include industry, regional dummies a dummy related to whether the accounting data were provided at site level; ii) estimates take account of the complex sample design. *Statistically significant at the .10 level, **at the .05 level, ***at the .01 level. Model1-Model3: dependent variable is the log of value added.

Table 11: Oaxaca decomposition of the average predicted value added and total factor productivity.

<i>Predicted Value Added</i>		
Characteristics	Coefficients	
	Italy	Britain
Italy	9.12	9.08
Britain	9.8	9.37
Oxaca decomposition		
1) Variable effect	0.28	
2) Coefficient effect	-0.03	
3) Coefficient*Variable effect	0	
Total effect	0.25	
<i>Predicted Total Factor Productivity</i>		
Characteristics	Coefficients	
	Italy	Britain
Italy	2.53	2.61
Britain	2.7	2.66
Oxaca decomposition		
1) Variable effect	0.05	
2) Coefficient effect	0.08	
3) Coefficient*Variable effect	0	
Total effect	0.13	
Oxaca decomposition for each variable:		
	Variable effect	Coefficient effect
High skilled	0.01	0.03
Team	-0.06	-0.05
Functional flexibility	-0.06	0.12
Meetings	0.09	-0.22
Information disclosure	-0.02	0.19
Human relations training	-0.06	-0.02
Financial participation	0.10	0.12
Industrial relations	0.05	0.20
Other variables	0	-0.29
Total	0.05	0.08