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# DO PRIVATE EQUITY-OWNED

# FIRMS HAVE BETTER MANAGEMENT PRACTICES?

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Abstract:
We use an innovative survey tool to collect *management practice* data from over 4,000 medium sized manufacturing firms across Asia, Europe and the US. These measures of managerial practice are strongly associated with firm-level performance (e.g. productivity, profitability and stock market value). Private equity firms *are* significantly better managed than government, family and privately owned firms. Although they are also better managed on average than publicly listed firms with dispersed owners, this difference is not statistically significant. Looking at management practices in detail we find that private equity owned firms have strong people management practices (hiring, firing, pay and promotions) but even stronger operations management practices (lean manufacturing, continuous improvement and monitoring). This suggests that private equity ownership is associated with broad based operational improvement in management rather than just stronger performance incentives. Finally, looking at changes in management practices over time, it appears that PE targets poorly managed firms and these firms improve their management practices at a faster rate than other ownership types.

# SECTION I: INTRODUCTION

Private equity (PE) ownership has become commonplace within the US and UK[1]. It is also increasing rapidly within Continental Europe and Asia. PE also appears to generate increases in profitability, as documented in several studies[2]. One view of this evolution is that PE ownership is associated with improved profitability through more effective use of debt and other financial instruments without any associated change in 'real' performance, such as greater productivity for ongoing business units. A second view of PE ownership is that it does enable improved firm-level productivity, but only through more efficient reallocations of labour and capital across plants from more targeted lay-offs and capital spin-outs. A third view is that PE ownership is a way to achieve improved management practices within firms through the introduction of new managers and better management practices[3]. In this paper, we focus on the last claim by looking at management practices across 4,000 PE-owned and other firms in a sample of medium-sized manufacturing firms in Asia, Europe and the US[4].

To implement this we first have to develop a technique to measure management practices across firms and countries. To do this we use a double-blind management survey developed in Bloom and Van Reenen [2007] to score on monitoring, targets and incentive management practices.

One part of the double-blind methodology is that our interviewers are not told anything about the financial performance of the firms they interview. The interviewers are simply given the firms' names and telephone numbers, making them 'performance blind' as they generally have not heard of the medium-sized companies we survey. The second part of the double-blind technique is that the managers we interview are not informed that they are being scored. To achieve this, we score management using a predefined practice grid provided by a leading international consultancy company and open-ended questions. The fact interviewers are 'performance blind' and managers are 'scoring blind' appears to provide informative management survey data.

To validate the accuracy of the scoring we carry out two pieces of analysis. First, we re-interview 222 firms using both a different interviewer and a different plant manager at the same firm. Comparing these independently run interviews with the first interviews, we confirm that our management practice survey is consistently measuring practices within firms. Second, we match our management practice data to firm-level performance indicators from independently collected company accounts, such as productivity, profitability, sales growth and Tobin's Q. We find that better management practices are strongly correlated with these independently collected firm performance measures. This is true for firms we interviewed from every region – the Anglo-Saxon countries (US and UK), Continental Europe (France, Germany, Sweden, Italy, Poland, Greece and Portugal) and Asia (China, India and

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[1] See Davis et al [2008]. They also point out that in inflation-adjusted dollars, fundraising by US PE groups was over 100 times greater in 2006 than in 1985. PE ownership is defined as a PE firm representing the largest ownership block.
[2] See Kaplan and Schoar [2005], Muscarella and Vetsuypens [1990] or Phalippou and Gottschalg [2007]. Bebchuk and Fried [2004] and Schleifer and Summers [1998] offer a more skeptical view.
[3] This is the view associated with Jensen [1986, 1989] – leverage, active investors and enhanced alignment of incentives of managers and shareholders drive business improvements. Holstrom and Kaplan [2001] argue that although this may have been true in the past technological change and deregulation meant that by the late 1990s these practices have been more generally adopted.
[4] We focus on medium-sized firms because there is little accounting information on very small firms. Our survey method involves interviewing one or two plant managers, which would not be representative of very large firms that could operate across hundreds of plants.

Japan). This suggests our survey measures of management practices are robustly informative about firm performance.

Using this new management practice data (collected in 2006) on over 4,000 firms in Asia, Europe and the US we turn to the analysis of the management practices in PE-owned firms. We find three broad sets of results. First, PE firms are on average the best-managed ownership group in the sample[5]. PE-owned firms are significantly better managed than government, family and privately owned firms. This is true even after controlling for a range of other firm characteristics such as country, industry, size and employee skills. While the results for PE vs dispersed shareholding firms are not statistically significant, they indicate that PE-owned firms have slightly higher management practice scores than those owned by dispersed shareholders. This seems consistent with Leslie and Oyer [2008], who found no evidence that PE firms outperformed public firms in their sample of US firms between 1996 and 2004.

Second, the main reason for the high average levels of management practices in PE firms is the lack of any 'tail' of very badly managed firms under their ownership (that is, very few PE firms are *really* badly managed). While government and family-owned firms, as well as firms owned by private individuals, have substantial 'tails' of badly managed firms, those owned by private equity appear to be all consistently well managed.

Finally, disaggregating the types of management practice, it seems that PE-owned firms have strong people management practices, in that they adopt merit-based hiring, firing, pay and promotions practices. Relative to other firms, they are even better at target management practices, in that PE-owned firms tend to have tough targets (evaluation metrics), which are integrated across the short and long run, well understood by the employees and linked to firm performance. However, PE-owned firms are better still at operational management practices. Operational management practices include the adoption of modern 'lean manufacturing' practices, using continuous improvements and a comprehensive performance documentation process. As such, this suggests PE ownership is associated with broad-based improvements across a wide range of management practices rather than simply just stronger performance incentives[6].

The layout of the rest of the paper is as follows. Section II discusses measuring management practices and the management data, and Section III offers an external validation of the survey tool. In Section IV we discuss the distribution of management practices across ownership types, focusing on PE in particular. Finally, some concluding comments are offered in Section V.

# SECTION II: MEASURING MANAGEMENT PRACTICES

To investigate these issues we first have to construct a robust measure of management practices and overcome three hurdles: scoring management practices, collecting accurate responses and obtaining interviews with managers. We discuss these issues in turn.

### III.A: Scoring management practices

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[5] The other ownership groups we consider are dispersed ownership, family-owned (external CEO), managerially owned, private individuals, family-owned (family CEO), founder-owned and government-owned. We discuss this in detail below.
[6] Leslie and Oyer [2008] show that PE-owned firms adopt much stronger incentives for their top managers (although this does not persist for more than one or two years after they go public).

To measure management requires codifying the concept of 'good' or 'bad' management into a measure applicable to different firms across the manufacturing sector. This is a hard task as good management is tough to define, and is often contingent on a firm's environment. There is no single index of good management, but our initial hypothesis is that while some management practices are too contingent to be evaluated as 'good' or 'bad', others can potentially be defined in these terms, and it is these practices we tried to focus on in the survey. To do this we used a benchmarking tool developed by a leading international management consultancy firm. In order to prevent any perception of bias with our study we chose to receive no financial support from this firm.

The practice evaluation tool defines and scores from 1 (worst practice) to 5 (best practice) across 18 key management practices used by industrial firms. These were chosen by working closely with a leading international management consultancy and are focused on best practices that can be used to increase manufacturing productivity. In Appendix A (Table A1) we detail the practices and the type of questions we asked in the same order as they appeared in the survey. In Table A2 we give four example practices, the associated questions and scoring system, and three anonymized responses per practice. Bloom and Van Reenen [2006] give examples that are more extensive across all 18 practices.

These practices are grouped into four areas:
    I)    *operations* (three practices)
        i.  introduction of lean manufacturing techniques
        ii.  documentation of improvements in processes
        iii.  rationale behind introduction of improvements
    II)    *monitoring* (five practices)
        i.  tracking of performance of individuals
        ii.  reviewing performance (e.g. through regular appraisals and job plans)
        iii.  performance dialogue (how meetings are structured, what type of feedback occurs)
        iv.  consequence management (e.g. making sure that plans are kept and appropriate sanctions and rewards are in place)
        v.  performance clarification and comparability
    III)    *targets* (five practices)
        i.  type of targets (whether goals are simply financial or operational or more holistic)
        ii.  realism of the targets (stretching, unrealistic or non-binding)
        iii.  transparency of targets (simple or complex)
        iv.  range of targets
        v.  interconnection of targets (e.g. whether they are given consistently throughout the organization)
    IV)    *incentives* (five practices)
        i.  rewarding high-performers (e.g. pay and bonus where best practice is deemed the approach that gives strong rewards for those with both ability and effort)
        ii.  removing poor performers (fixing or firing bad performers)
        iii.  promotion criteria (e.g. purely tenure-based or including an element linked to individual performance)
        iv.  attracting human capital
        v.  retaining human capital

A subset of the practices has similarities with those used in studies on human resource management practices.

Since the scaling may vary across practices in the econometric estimation, we convert the scores (from the 1-5 scale) to z-scores by normalizing by practice to mean zero and standard deviation one. In our main econometric specifications, we take the unweighted average across all z-scores as our primary measure of overall managerial practice, but we also experiment with other weighting schemes based on factor analytic approaches.

There is scope for legitimate disagreement over whether all of these measures really constitute 'good practice'. Therefore, an important way to examine the external validity of the measures is to examine whether they are correlated with data on firm performance constructed from completely independent data sources – company accounts and the stock market. We do this in Section IV, where we show that our measures are strongly correlated with measures of (total factor) productivity, profitability, sales growth, market-to-book ratios and firm survival. We also investigate whether the measures may be culturally biased towards an Anglo-Saxon view of the world. Although this is possible, at least two pieces of evidence suggest that the measures are not wholly biased in this manner. First, we show that our management scores are correlated with productivity among every regional group – that is, the relationship between our measures of management and productivity as derived from an entirely separate data source (firm accounts) is as strong (if not stronger) in France and Germany as it is in the US or the UK. Second, although the US scores on average the highest on our management measures, Britain scores relatively poorly – significantly worse than Japan, Germany or Sweden for example. If the measures were fundamentally biased towards English-speaking nations it is unlikely that England would score so poorly.

### III.B: Collecting accurate responses

With this evaluation tool, we can provide some quantification of firms' management practices. However, an important issue is the extent to which we can obtain unbiased responses to our questions from firms. In particular, will respondents provide accurate responses? As is well known in the surveying literature (for example, Bertrand and Mullainathan [2001]) a respondent's answer to survey questions is typically biased by the scoring grid, anchored towards those answers that they suspect the interviewer thinks are correct. In addition, interviewers may themselves have preconceptions about the performance of the firms they are interviewing and bias their scores based on their ex ante perceptions. More generally, a range of background characteristics, potentially correlated with good and bad managers, may generate some kinds of systematic bias in the survey data.

To try to address these issues we took a range of steps to obtain accurate data. First, the survey was conducted by telephone without telling the managers that they were being scored[7]. This enabled scoring to be based on the interviewer's evaluation of the firm's actual practices, rather than its aspirations, the manager's perceptions or the interviewer's impressions. To run this 'blind' scoring we used open questions (for example, "Can you tell me how you promote your employees?"), rather than closed questions (for example, "Do you promote your employees on tenure [yes/no]?"). Furthermore, these questions target actual practices and examples, with the discussion continuing until the interviewer can make an accurate assessment of the firm's typical practices based on these examples. For each practice, the first question is broad with detailed follow-up questions to fine-tune the scoring. For example, in dimension (1) *Modern manufacturing introduction* the initial question is

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[7] This survey tool has been passed by Stanford Univerity's Human Subjects Committee. The deception involved was deemed acceptable because it is: (i) <u>necessary</u> to get unbiased responses; (ii) <u>minimized</u> to the management practice questions and is temporary (we send managers debriefing packs afterwards); and (iii) <u>presents no risk</u> as the data are confidential.

"Can you tell me about your manufacturing process?" and is followed up by questions such as "How do you manage your inventory levels?".

Second, the interviewers did not know anything about the firm's financial information or performance in advance of the interview. This was achieved by selecting medium-sized manufacturing firms and by providing only the names of the firms and their contact details to the interviewers, but no financial details. Consequently, the survey tool is 'double blind' – managers do not know that they are being scored and interviewers do not know about the performance of the firm. The interviewers were incentivized on the number of interviews they ran and so had no interest in spending time researching the companies in advance of running the interview. These smaller firms (the median size was 675 employees) would not be known by name and are rarely reported in the business media. The interviewers were specially trained graduate students from top European and US business schools. All interviews were conducted in the manager's native language.

Third, each interviewer ran over 50 interviews on average, allowing us to remove interviewer-fixed effects from all empirical specifications. This helps to address concerns over inconsistent interpretation of categorical responses (see Manski [2004]), standardizing the scoring system.

Fourth, the survey instrument was targeted at plant managers, who are typically senior enough to have an overview of management practices but not so senior as to be detached from day-to-day operations of the enterprise.

Fifth, we collected a detailed set of information on the interview process itself (number and type of prior contacts before obtaining the interviews, duration, local time of day, date and day of the week); on the manager (gender, seniority, nationality, company and job tenure, internal and external employment experience and location); and on the interviewer (individual interviewer-fixed effects, time of day and subjective reliability score). Some of these survey controls are significantly informative about the management score[8] and help reduce residual variation.

### III.C: Ensuring international comparability
In comparing organizational and management surveys across countries we have to be extremely careful to ensure comparability of responses. To maximize comparability we undertook three steps. First, every interviewer had the same initial three days of interview training, provided jointly by the Centre for Economic Performance and our partnering international consultancy firm. This training included three role-play calibration exercises, where the group would all score a role-played interview and then together discuss the scoring of each question. This was aimed at ensuring every interviewer had a common interpretation of the scoring grid. In addition, every Friday afternoon throughout the survey period the group met for 90 minutes for training and to discuss any problems with interpretation of the survey.

Second, the team operated from one location, the Centre for Economic Performance at the London School of Economics (LSE), using two large survey rooms. The different national survey teams were

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[8] In particular, we found the scores were significantly higher for senior managers, when interviews were conducted later in the week and/or earlier in the day. That is to say, scores were highest, on average, for senior managers on a Friday morning and lowest for junior managers on a Monday afternoon. By including information on these characteristics in our analysis, we explicitly controlled for these types of interview bias.

thus listening in on each other's surveys on a daily basis, were organized and managed in the same way, and ran the surveys using exactly the same telephone, computer and software technology[9].

Third, the individual interviewers interviewed firms in multiple countries. The team language was English, with every interviewer able to complete English language interviews, so that interviewers were able to interview firms from their own country plus the UK and US. As a result, the median number of countries that each interviewer scored was three, enabling us to remove interviewer-fixed effects in the cross-country analysis.

### III.D: Obtaining interviews with managers
Each interview took on average 50 minutes and was run in the summer of 2006. Overall, we obtained a relatively high response rate of 45%, which was achieved through four steps. First, the interview was introduced as "a piece of work"[10] without discussion of the firm's financial position or its company accounts, making it relatively uncontroversial for managers to participate. Interviewers did not discuss financial information in the interviews, both to maximize the participation of firms and to ensure our interviewers were truly 'blind' on the firm's financial position. Second, the survey was ordered to lead with the least controversial questions (for example, on shop-floor operations management), leading on to monitoring, incentives and organizational structure. Third, interviewers' performance was monitored, as was the proportion of interviews achieved, so they were persistent in chasing firms. The questions were also about practices within the firm in order that any plant manager could respond, so there were potentially several managers per firm who could be contacted[11]. Fourth, the written endorsement of many official institutions[12] helped demonstrate to managers that this was an important academic exercise with official support. Fifth, the involvement of Cambridge and Stanford universities and the LSE, along with the institutions of the interviewers[13], provided a signal of the research focus of the work.

### III.E: Defining private equity ownership
For 80% of the firms in our sample, the ownership definition was collected during the survey interview. During the interview the manager was asked about the ultimate ownership of the firm. Interviewers would then allocate the response to the most appropriate ownership definition from the following options: 1) Dispersed shareholders (defined as no one holding more than 25% of the firm's equity); 2) Cooperative; 3) Family; 4) Founder; 5) Government; 6) Managers; 7) Private equity or venture capital; 8) Private individuals; 9) Other.

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[9] See http://www.youtube.com/watch?v=HgJXt8KwhA8 for video footage of the survey team.

[10] We avoided using the words "research" or "survey" as many firms link these to market research surveys, which they often refuse to be involved with.

[11] We found no significant correlation between the number, type and timescale of contacts before an interview was conducted and the management score. This suggests that while different managers may respond differently to the interview proposition this does not appear to be correlated with their responses or the average management practices of the firm.

[12] The Banque de France, Bank of Greece, Bank of Japan, Bank of Portugal, Bundesbank, Confederation of Indian Industry, European Central Bank, European Commission, Federation of Greek Industries, IUI Sweden, Ministero delle Finanze, National Bank of Poland, Peking University, People's Bank of China, Polish Treasury, Reserve Bank of India, Shenzhen Development Bank, Sveriges Riksbank, UK Treasury and Warsaw Stock Exchange

[13] Interviewers were drawn from the following universities: Berkeley, City of London, Columbia, Harvard, HEC School of Management, IESE Business School, Imperial, INSEAD, Kellogg, London Business School, LSE, Lund, MIT, Nova de Lisbon, Oxford, Stanford and Yale.

In order to cross-check the accuracy of this information[14] and to populate the other 20% of the data we gathered additional data from manual searches. More specifically, we used the global ultimate owner information provided by ORBIS and ZEPHYR, Bureau van Dijk (BVD) datasets specifically designed to study firm-level ownership information. For about 30% of the sample, ownership data were not available from either ORBIS or ZEPHYR so we also looked at companies' websites as many firms report information on ownership in the 'about us' or 'company history' sections of their websites. If nothing could be found on company websites, we then looked for generic news articles on firms using Lexis/Nexis and simple Google searches. This enabled us to collect ownership data for all the firms in the database.

There was a problem in the Swedish sample as a large number of firms said that they were owned by Wallenberg (called Investor AB). We dropped these from the sample in the main results, but also examined what happened if we defined these as PE firms. The results were robust when using this definition.

### III.F: Sampling frame and additional data

Since our aim is to compare across countries we decided to focus on the manufacturing sector, where productivity is easier to measure than in the non-manufacturing sector. We also focused on medium-sized firms, selecting a sample of firms with predicted employment of between 100 and 5,000 workers (with a median of 270). Very small firms have little publicly available data. Very large firms are likely to be more heterogeneous across plants, and so it would be more difficult to get a picture of organization in the firm as a whole from interviews with one or two plant managers. We drew a sampling frame from each country to be representative of medium-sized manufacturing firms and then randomly chose the order of which firms to contact (see Appendix B for details). Since we use different databases in Europe (Amadeus), the US (Icarus), China and Japan (Oriana) and India (Firstsource) we had concerns regarding the cross-country comparisons so we include country dummies in all of the preferred specifications. Our choice of countries was determined by economic size, data and our ability to hire analysts who were natives of the countries in which interviews were being conducted (in order for the interview to be conducted fluently in the same language as the plant manager being interviewed).

Comparing the responding firms with those in the sampling frame, we found no evidence that the responders were systematically different from the non-responders on any of the performance measures. They were also statistically similar on all the other observables in our dataset. The only exception was on size and multinational status, where our firms were slightly larger on average than those in the sampling frame and slightly more likely to be a multinational subsidiary (see Appendix B for details).

We also collected a large amount of additional data from the survey to use as controls. On the human resource side, we have information on the proportion of the workforce with degrees, average hours worked and the gender and age breakdown of the workforce. In addition, from the sample databases we have information on firm size, whether the firm was listed on the stock exchange and standard accounting information on sales, capital, etc.

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[14] The manager's statements were almost always correct.

# SECTION III: VALIDATING THE MANAGEMENT PRACTICES MEASURES

Before we investigate the reasons for the spread of management practices across firms it is worth evaluating whether these practices are correlated with firm performance. The purpose of this exercise is not to directly identify a causal relationship between our management practice measures and firm performance. It is rather an external validity test of the survey measurement tool to check that the scores are not just 'cheap talk' but are actually correlated with quantitative measures of firm performance from independent data sources on company accounts, survival rates and market value.

### III.A: Internal data validation: Independent manager and interviewer resurveys

The data potentially suffer from several types of measurement error that are likely to bias the association of firm performance with management towards zero. First, we could have measurement error in the management practice scores obtained using our survey tool. To quantify this, we performed repeat interviews on 222 firms, contacting different managers in the firm, typically at different plants and using different interviewers. To the extent that our management measure is truly picking up general company-wide management practices these two scores should be correlated, while to the extent the measure is driven by noise the measures should be independent.

The correlation of the first interview against the second interview was strongly positive (a correlation coefficient of 0.627 with a p-value of 0.000), and is plotted in Figure 1. Furthermore, there is no obvious (or statistically significant) relationship between the difference between the first and second interviews and the absolute score. That is to say, high and low scores appear to be as well measured as average scores, and firms that have high (or low) scores on the first interview tend to have high (or low) scores on the second interview. Thus, firms that score below two or above four appear to be genuinely badly or well managed rather than extreme draws of sampling measurement error.

### III.B External data validation: Management practices and productivity

Consider the basic firm 'production function':

(1) $$y_{ijc} = \alpha_l\, l_{ijc} + \alpha_k\, k_{ijc} + \alpha_n\, m_{ijc} + \beta\ MNG_{ijc} + \gamma' Z_{ijc} + \eta_j + \theta_c + u_{ijc}$$

where $y = \ln(\text{deflated sales})$ of firm $i$ in (three-digit) industry $j$ in country $c$. The conventional factor inputs are $l$, ln(labour), $k$, ln(capital) and $m$, ln(materials); and in some specifications reported we allow country-specific parameters on the inputs. The $Z$s are a number of other controls that will affect productivity, such as workforce characteristics (the proportion of workers with a college degree and the average hours worked), firm characteristics (firm age and whether the firm is publicly listed on the stock market), a complete set of three-digit industry dummies and country dummies.

The crucial variable for us is management practices denoted *MNG*. Our basic measure takes z-scores of each of the 18 individual management practices and then averages over the variables to proxy *MNG*. We experimented with a number of other approaches, including using the primary factor from factor-analysis and using the raw average management scores, and found very similar results.

Table I investigates the association between firm performance and management practices. Column (1) simply reports a level OLS specification including only industry, country and time dummies as additional controls. The management score is strongly positively and significantly associated with

higher labour productivity. The second column includes fixed capital, materials and skills, plus our general controls of industry dummies, average hours worked, education, firm age and listing status, and a full set of interview 'noise controls' to mitigate biases across interviewers and types of interviewees. This has little effect on the point estimate on the management term. Overall, the first two columns suggest that the average management score is positively and significantly correlated with higher productivity.

Columns (3), (4) and (5) of Table I examine three other measures of firm performance. In column (3) we use an alternative performance measure, which is return on capital employed (ROCE). The significant and positive coefficient on management in the ROCE equation, which also includes the same set of controls as in column (2), confirms the basic productivity results. In column (4) we look at sales growth and also find a positive and (weakly) significant coefficient. In column (5), we estimate a Tobin's Q specification (the ratio of the market value of the firm to its book value), which again includes the same set of controls as in the production function. We also find a significant and positive coefficient on management. Note that we also find a strong and positive correlation between firm size and management practices, which is often used as another measure of firm performance and is consistent with the Lucas [1978] model. Survival rates are also higher for better-managed firms (see Bloom and Van Reenen [2007]).

We were concerned that the definition of 'good management' may be culturally biased towards an Anglo-Saxon view of the management world. Some may regard such business practices as suitable for Britain and America, but less suitable for Continental Europe. We empirically tested this by regressing our preferred productivity equation from column (2) separately for firms from Anglo-Saxon countries (US and UK, in column (6)), Asian countries (China, India and Japan, in column (7)) and Continental European countries (France, Germany, Greece, Italy, Poland, Portugal and Sweden in column (8)). We found that the management coefficient was positive and significant in all regional blocs, which suggests that our concept of good management is not specific to the English-speaking world but of more general applicability[15].

Finally, in two other pieces of work we have looked at the relationship between management practices and wider 'social performance' measures. In Bloom, Kretschmer and Van Reenen [2006] we examined the relationship between management practices and work-life balance in the firm, both in terms of subjective employee statements on overall work-life balance and objective measures of the ability of employees to work from home, job-share, work part-time and take time off for child care. We found that firms that scored more highly on our indicators for management practices also had significantly higher subjective and objective employee work-life balance. This is consistent with the view that improved management practices do not come at the expense of workers' welfare (at least in the dimension of work-life balance). In Bloom, Genakos, Martin et al. [2008] we looked at the relationship between management practices and firms' energy use, finding that well-managed firms tended to use less energy in the production process. One obvious explanation is that the adoption of modern lean manufacturing techniques enables firms to profitably reduce the energy intensity of their production process.

Overall then, there is substantial evidence that the measures of management we use are positively and significantly associated with better firm performance across a number of dimensions. These results

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[15] The coefficients on the factor inputs suggest constant returns to scale in each country, but with different factor intensities. Material inputs are not available for UK and US companies.

also offer some external validation of the survey tool, implying that we are not simply measuring statistical noise.

# SECTION IV: MANAGEMENT PRACTICES IN PRIVATE EQUITY FIRMS

### IV.A: Overall management practices

We start by investigating the relationship between private equity ownership and management practices. To do this we have allocated firms into several ownership groups according to the type of their single-largest shareholding block. In Figure 2 we show the average management score by these ownership groups, while in Table I we show these results in statistical form after adding a variety of controls.

Looking first at Figure 2, three main results stand out from the raw data. First, PE firms received the highest management scores on average. Second, dispersed ownership firms (those with no ownership block above 25%, often publicly quoted) are almost as well run as PE-owned firms. Third, government-owned firms, family-owned firms with a family CEO[16], founder-owned firms (the individual who set up the company) and companies owned by private individuals are notably more poorly managed than PE-owned firms.

Table II column (1) reports these differences alongside standard errors, produced by regressing management practices on ownership dummies with the PE ownership category as the omitted category. This shows that the difference between PE-owned firms and dispersed ownership firms are small in magnitude and not statistically significant. On the other hand, the difference between PE-owned firms and government-, founder- and family-owned and family-CEO firms is highly significant. In column (2) we add country dummies, because many PE firms are in more developed countries (US, UK and Sweden) while many government-owned and family-owned firms are in developing countries. Controlling for country of location reduces the gaps between the ownership types, but leaves the qualitative results broadly unchanged. In columns (3) and (4) we add in subsequent controls for three-digit industry dummies, firm size, worker skills, hours and a survey noise, and again find the results are broadly robust.

Figure 2 also contains information on management practices based on the current owner (dark shading) and based on the ownership if this has been continuous for the last three years (light shading). We see that among firms with stable ownership over the last three years PE-managed firms appear to have a slightly better average management score. This suggests that PE ownership is associated with relatively better management practices after a longer period of ownership. This is presumably because firms recently acquired by PE firms may be badly managed, if they are selected on their potential for performance improvement. We investigate this selection issue in more detail in sub-section IV.D below by examining the subset of our data where we have longitudinal information on changes in management practices.

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[16] Family-owned firms that appoint an external CEO appear to be well managed, suggesting that it is merit-based appointment of senior managers which matters more than family ownership per se.

### IV.B Consistency of management practices across ownership types

Figure 3 plots the management practice histogram across firms by ownership category (in solid shading). Overlaid on this is the kernel density plot[17] for PE firms (dashed line), to facilitate a comparison between the distribution of firms' management practices between PE firms and other ownership categories. This shows that PE-owned firms have better management practices on average than government-owned, founder-owned, family-owned and family-CEO, and privately owned firms because of the lack of a tail of badly managed firms. For example, out of the 137 PE-owned firms in the sample only one has a management score of less than 2 while government-, founder- and family-owned and family-CEO firms all have more than 15% of their management scores less than 2. By contrast, dispersed shareholder firms have a very similar distribution of scores to PE-owned firms.

### IV.C: Types of management practices

We also investigate in Table III to what extent the difference between PE management practices and other firms is due to particular types of management practices. This reports the results from regressing the average management scores for the four subgroups of management practices outlined in Section II.A – operations management, monitoring, targets and incentives – against a PE ownership dummy, with all other firms as the baseline group. Each one of the four management practice subgroups was normalized to have a standard deviation to unity. Therefore, the coefficient on the private equity dummy in each column reports how many standard deviations PE firms are different from all other firms on that management practice.

In column (1) of Table III we report the results for operations management (lean manufacturing and continuous improvement) and find PE firms are significantly better-managed on this dimension than other types of firms. In column (2) we add controls for country, industry, firm and noise and find that PE firms are still significantly better than other firms on operations management. Columns (3) to (8) repeat similar estimations of the difference between PE and non-PE firms on monitoring, targets and incentives management with and without other controls. Interestingly, we find that while PE firms are significantly better than non-PE firms on all types of management practices, this is notably so on operations and monitoring practices.

In Table IV we look at the differential between PE-owned firms and all other firms on all 18 of the individual management practices. What we find is that PE firms are substantially better at the adoption of modern lean manufacturing techniques, and at process documentation, review and tracking. Interestingly, the other area where they are notable better than other firms is in removing poor performers, suggesting that they are more willing to retrain or exit underperforming employees.

### IV.D: Changes in management practices over time

We followed the 732 firms interviewed in 2004 in Bloom and Van Reenen [2007] through to 2006. We were able to collect information on 561 of these firms and can observe how our management measure evolves over time. Fifty-six of these firms had some change in ownership over these two years so we can examine changes in practices among firms who stayed in the same ownership type and in those who changed. Figure 4 plots out the change in the management index by ownership type. The bottom bar shows that firms which remained in private equity hands for at least three years had the fastest *improvement* of management practices of all the different ownership types. By contrast, the firms whose management performance was deteriorating were more likely to be taken over by private equity (second from bottom bar).

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[17] The kernel is estimated using an Epanechnikov smoother over a bandwidth of 100 firms.

The obvious interpretation of this graph is that PE disproportionately targets firms whose management is underperforming and are then better at improving them. Although this is consistent with anecdotal evidence, an important caveat is that we do not have a long period after the PE takeover so we cannot be sure of this interpretation. Furthermore, some of the cell sizes are very small – we only have nine firms who remained in PE for three years or more, for example.

With these caveats in mind, Figure 4 reinforces the point in Figure 2 that we may be underestimating the benefits of PE ownership by simply looking at the cross-sectional correlations. The fact that PE seem to target underperforming firms means that there will be a downward bias to the cross-sectional regressions in Tables II through IV (which may be why PE firms appear no better than those with dispersed ownership patterns).

A final reason why we may be underestimating some of the benefits of PE is that we are mixing all types of very heterogeneous PE firms together. It may be that the larger and more prestigious PE firms are much better at improving firm performance. To investigate this we identified the names of the PE firms who owned the firms in our sample and examined whether these 'top tier' PE firms were different[18]. Unfortunately, we were unable to detect significant differences between these types of firms, which was probably related to the small sample size of PE firms (there are only 137 in our sample).

# SECTION V: CONCLUSIONS

Using a new survey tool we collect management practice and ownership data from over 4,000 medium-sized manufacturing firms across Asia, Europe and the US. We find three broad sets of results.

First, PE firms are on average the best-managed ownership group in the sample. PE firms are significantly better managed than government-owned, family-owned and privately owned firms. This is true even after controlling for a range of other firm characteristics such as country, industry, size and employee skills. However, the difference in management practice scores between PE and dispersed shareholding firms (including publicly quoted firms) is small and insignificant. Second, the reason for the high average levels of management practices in PE firms is the lack of any tail of badly managed firms under their ownership. While government-owned, family-owned and privately owned firms have substantial tails of badly managed firms, those owned by private equity are all consistently well managed. Finally, PE-owned firms are particularly strong at operations management practices, such as the adoption of modern lean manufacturing practices, using continuous improvements and a comprehensive performance documentation process. As such, this suggests PE ownership is associated with broad-based improvements across a wide range of management practices rather than simply just stronger performance incentives.

One limitation of our study is that it is mainly cross-sectional, so we cannot determine the causal effect of PE on management practices and performance as we do not have a sufficiently long panel or an instrumental variable for PE. Nevertheless, we do find evidence suggesting that we may be underestimating the positive effects of PE. Using a small panel of changes in management practices,

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[18] We used the 'top 15' PE firms from the website http://www.peimedia.com/pei50. Results are similar when using the top 10 or 5.

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we find that PE firms have the fastest improvement in management. This is partly disguised because PE firms also seem to select underperforming firms, which they then subsequently help turn around.

A second limitation is that our measures of management practice are coarse and cannot capture all of the nuances of management style and strategy. Having some quantitative cross-national measures that can be used across a range of industries is, in our view, an important advantage of this study. These practice measures are complementary to (and strongly correlated with) other measures of firm performance such as productivity. The findings reported here are the first for PE and management practices so are an initial step in a longer-term research programme.

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## TABLE I: Management practices and firm performance

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Firms | All | All | All | All | Quoted | US and UK | Asian | Continental European |
| Dependent variable | Ln (Y) $_{it}$ Sales | Ln (Y) $_{it}$ Sales | ROCE Profitability | Sales growth | Ln (Tobin's Av. Q) | Ln (Y) $_{it}$ Sales | Ln (Y) $_{it}$ Sales | Ln (Y) $_{it}$ Sales |
| **Management z-score** | 0.616*** | 0.192*** | 0.982** | 0.007* | 0.223*** | 0.169*** | 0.474** | 0.203*** |
| | (0.038) | (0.021) | (0.438) | (0.004) | (0.079) | (0.033) | (0.187) | (0.027) |
| **Ln (L) $_{it}$** Labour | | 0.626*** | 1.035*** | -0.007 | 0.097 | 0.750*** | 0.239** | 0.584*** |
| | | (0.029) | (0.327) | (0.004) | (0.075) | (0.033) | (0.093) | (0.044) |
| **Ln (K) $_{it}$** Capital | | 0.255*** | -1.126*** | 0.007** | -0.096 | 0.201*** | 0.493*** | 0.233*** |
| | | (0.017) | (0.226) | (0.003) | (0.066) | (0.025) | (0.049) | (0.023) |
| **Ln (N) $_{it}$** Materials | | 0.205*** | 0.212 | 0.018*** | -0.057 | | 0.240** | 0.251*** |
| | | (0.015) | (0.243) | (0.003) | (0.053) | | (0.113) | (0.019) |
| **ln (H) $_{it,}$** % employees with a degree | | 0.057*** | 0.166 | 0.000 | 0.103*** | 0.043*** | -0.015 | 0.055*** |
| | | (0.010) | (0.202) | (0.002) | (0.036) | (0.013) | (0.045) | (0.013) |
| Country, time and industry dummies | YES | YES | YES | YES | YES | YES | YES | YES |
| Firm controls | NO | YES | YES | YES | YES | YES | YES | YES |
| Noise controls | NO | YES | YES | YES | YES | YES | YES | YES |
| Firms | 3,278 | 3,278 | 2,432 | 2,953 | 327 | 1,058 | 615 | 1,605 |
| Observations | 13,922 | 13,922 | 11,656 | 12,948 | 1,561 | 4,691 | 914 | 8,317 |

NOTES: ***denotes that a coefficient is significant at the 0.01 level, ** at the 0.05 level and * at the 0.10 level. All columns estimated by OLS. In all columns standard errors are in parentheses under coefficient estimates and allow for arbitrary heteroskedasticity and serial correlation (i.e. clustered by firm). '**Firm controls**' comprise of firm-level controls for ln(average hours worked), ln(firm age), a dummy for being listed and the share of the workforce with degrees. **'Noise controls'** are 48 interviewer dummies, the seniority, gender, tenure and number of countries worked in of the manager who responded, the day of the week the interview was conducted, the time of day the interview was conducted, the duration of the interviews and an indicator of the reliability of the information as coded by the interviewer. Accounting data span 2001 to 2006. All regressions include a full set of three-digit industry dummies and 11 country dummies. Materials data were not directly available for the UK and US so we could not include this variable in the regressions of column (6). In other columns (1)-(5) we include a dummy variable for when materials data are missing.

# TABLE II: Ownership types and management practices

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **Estimation method** | OLS | OLS | OLS | OLS |
| **Dependent variable** | Management raw score | Management raw score | Management raw score | Management raw score |
| **PE-owned** | Baseline | Baseline | Baseline | Baseline |
| **Dispersed shareholders** | -0.044 | -0.003 | -0.011 | -0.042 |
| | (0.041) | (0.042) | (0.042) | (0.039) |
| **Family-owned, external CEO** | -0.094 | -0.071 | -0.058 | -0.121** |
| | (0.060) | (0.059) | (0.059) | (0.052) |
| **Managers** | -0.179*** | -0.143** | -0.126* | -0.099* |
| | (0.065) | (0.065) | (0.067) | (0.059) |
| **Private individuals** | -0.348*** | -0.249*** | -0.239*** | -0.169*** |
| | (0.045) | (0.046) | (0.046) | (0.042) |
| **Family-owned, family CEO** | -0.482*** | -0.414*** | -0.384*** | -0.281*** |
| | (0.045) | (0.046) | (0.046) | (0.043) |
| **Founder ownership** | -0.573*** | -0.403*** | -0.381*** | -0.267*** |
| | (0.046) | (0.047) | (0.048) | (0.044) |
| **Government ownership** | -0.633*** | -0.401*** | -0.393*** | -0.378*** |
| | (0.061) | (0.061) | (0.061) | (0.056) |
| **Other** | -0.204*** | -0.131*** | -0.127** | -0.136*** |
| | (0.050) | (0.051) | (0.051) | (0.046) |
| **Country controls** | NO | YES | YES | YES |
| **Industry controls** | NO | NO | YES | YES |
| **Firm and noise controls** | NO | NO | NO | YES |
| **Firms** | 4,081 | 4,081 | 4,081 | 4,081 |

NOTES: *** denotes that a coefficient is significant at the 0.01 level, ** at the 0.05 level and * at the 0.10 level. All columns estimated by OLS. In all columns robust standard errors are in parentheses under coefficient estimates. '**Firm controls**' are comprised of firm-level controls for ln(average hours worked), ln(firm age), a dummy for being listed and the share of the workforce with degrees. **'Noise controls'** are 48 interviewer dummies; the seniority, gender, tenure and number of countries worked in of the manager who responded; the day of the week the interview was conducted; the time of day the interview was conducted; the duration of the interviews; and an indicator of the reliability of the information as coded by the interviewer.

# TABLE III: Management practice types and private equity ownership

| Dependent variable: | (1)<br>Operations | (2)<br>Operations | (3)<br>Monitoring | (4)<br>Monitoring | (5)<br>Targets | (6)<br>Targets | (7)<br>Incentives | (8)<br>Incentives |
|---|---|---|---|---|---|---|---|---|
| **PE-owned** | 0.454***<br>(0.074) | 0.163**<br>(0.078) | 0.482***<br>(0.067) | 0.239***<br>(0.067) | 0.398***<br>(0.074) | 0.138**<br>(0.069) | 0.196***<br>(0.074) | 0.108<br>(0.069) |
| **Country controls** | NO | YES | NO | YES | NO | YES | NO | YES |
| **Industry controls** | NO | YES | NO | YES | NO | YES | NO | YES |
| **Firm and noise controls** | NO | YES | NO | YES | NO | YES | NO | YES |
| **Firms** | NO | YES | NO | YES | NO | YES | NO | YES |
| **Observations** | 4,081 | 4,081 | 4,081 | 4,081 | 4,081 | 4,081 | 4,081 | 4,081 |

NOTES: *** denotes that a coefficient is significant at the 0.01 level, ** at the 0.05 level and * at the 0.10 level. All columns estimated by OLS. Columns (1) and (2) dependent variable is operations management (Table A1 questions 1, 2 and 3), columns (3) and (4) dependent variable is monitoring (Table A1 questions 4, 5, 6, 7 and 12), columns (5) and (6) dependent variable is targets (Table A1 questions 8, 9, 10, 11 and 13), while columns (7) and (8) dependent variable is incentives (Table A1 questions 14, 15, 16, 17 and 18). The management dependent variables in each column have been normalized to have a standard deviation of unity. In all columns robust standard errors are in parentheses under coefficient estimates. '**Firm controls**' are comprised of firm-level controls for ln(average hours worked), ln(firm age), a dummy for being listed and the share of the workforce with degrees. **'Noise controls'** are 48 interviewer dummies; the seniority, gender, tenure and number of countries worked in of the manager who responded; the day of the week the interview was conducted, the time of day the interview was conducted; the duration of the interviews; and an indicator of the reliability of the information as coded by the interviewer.

## TABLE IV: Individual management practices and private equity ownership

| Practice name | Practice number | Practice type | Average value for private equity (Point estimate) |
|---|---|---|---|
| **Modern manufacturing,** | 1 | Operations | 0.129 (0.085) |
| **Modern manufacturing, rationale** | 2 | Operations | 0.069 (0.080) |
| **Process documentation** | 3 | Operations | 0.219*** (0.076) |
| **Performance tracking** | 4 | Monitoring | 0.231*** (0.071) |
| **Performance review** | 5 | Monitoring | 0.191*** (0.072) |
| **Performance dialogue** | 6 | Monitoring | 0.261*** (0.078) |
| **Consequence management** | 7 | Monitoring | 0.138* (0.072) |
| **Target breadth** | 8 | Targets | 0.128* (0.074) |
| **Target interconnection** | 9 | Targets | 0.105 (0.076) |
| **Target time horizon** | 10 | Targets | 0.141* (0.083) |
| **Targets are stretching** | 11 | Targets | 0.100 (0.074) |
| **Performance clarity and comparability** | 12 | Monitoring | 0.056 (0.080) |
| **Managing human capital** | 13 | Targets | 0.026 (0.083) |
| **Rewarding high performance** | 14 | Incentives | 0.036 (0.080) |
| **Removing poor performers** | 15 | Incentives | 0.142** (0.070) |
| **Promoting high-performers** | 16 | Incentives | 0.057 (0.088) |
| **Attracting human capital** | 17 | Incentives | 0.020 (0.073) |
| **Retaining human capital** | 18 | Incentives | 0.092 (0.085) |

NOTES: Each row shows the point estimate (standard error) from regressing the z-score for that practice against a private equity ownership dummy in the sample of 4,081 firms with complete management practice data. The practice z-score is the score outlined in Appendix A below, normalized to have a mean of zero and a standard deviation of 1. *** denotes that the variable is significant at the 1% level, ** denotes 5% significance and * denotes 10% significance. Estimation by OLS with robust standard errors in parentheses. Controls are the same as in columns (2), (4), (6) and (8) of Table III, so include country dummies, industry dummies, firm and plant size, and noise controls. Noise controls include the day of the week the interview took place, an interview reliability score, the manager's seniority and tenure, the duration of the interview, and four dummies for missing values in seniority, tenure, duration and reliability.

# APPENDIX A: DETAILS OF THE SURVEY QUESTIONNAIRES

## TABLE A1: Full list of management practices with examples of the questions asked

| Practice | Practice number | Practice type | Example of questions we asked |
|---|---|---|---|
| **Modern manufacturing, introduction** | 1 | Operations | a) Can you describe the production process for me?<br>b) What kinds of lean (modern) manufacturing processes have you introduced? Can you give me specific examples?<br>c) How do you manage inventory levels? What is done to balance the line? |
| **Modern manufacturing, rationale** | 2 | Operations | a) Can you take me through the rationale to introduce these processes?<br>b) What factors led to the adoption of these lean (modern) management practices? |
| **Process documentation** | 3 | Operations | a) How would you go about improving the manufacturing process itself?<br>b) How do problems typically get exposed and fixed?<br>c) Talk me through the process for a recent problem.<br>d) Do the staff ever suggest process improvements? |
| **Performance tracking** | 4 | Monitoring | a) Tell me how you track production performance?<br>b) What kind of key performance indicators (KPIs) would you use for performance tracking? How frequently are these measured? Who gets to see this KPI data?<br>c) If I were to walk through your factory could I tell how you were doing against your KPIs? |
| **Performance review** | 5 | Monitoring | a) How do you review your key performance indicators (KPIs)?<br>b) Tell me about a recent meeting. Who is involved in these meetings?<br>c) Who gets to see the results of this review? |
| **Performance dialogue** | 6 | Monitoring | a) How are these meetings structured? Tell me about your most recent meeting.<br>b) During these meetings, how much useful data do you have?<br>c) How useful do you find problem-solving meetings?<br>d) What type of feedback occurs in these meetings? |

| | | | |
|---|---|---|---|
| **Consequence management** | 7 | Monitoring | a) What happens if there is a part of the business (or a manager) who isn't achieving agreed-upon results? Can you give me a recent example? <br> b) What kind of consequences would follow such an action? <br> c) Are there any parts of the business (or managers) that seem to repeatedly fail to carry out agreed actions? |
| **Target breadth** | 8 | Targets | a) What types of targets are set for the company? What are the goals for your plant? <br> b) Tell me about the financial and non-financial goals. <br> c) What do company headquarters (CHQ) or its appropriate manager emphasize to you? |
| **Target interconnection** | 9 | Targets | a) What is the motivation behind your goals? <br> b) How are these goals cascaded down to the individual workers? <br> c) What are the goals of the top management team (do they even know what they are!)? <br> d) How are your targets linked to company performance and its goals? |
| **Target time horizon** | 10 | Targets | a) What kind of timescale are you looking at with your targets? <br> b) How are long-term goals linked to short-term goals? <br> c) Could you meet all your short-term goals but miss your long-term goals? |
| **Targets are stretching** | 11 | Targets | a) How tough are your targets? Do you feel pushed by them? <br> b) On average, how often would you say that you meet your targets? <br> c) Are there any targets which are obviously too easy (will always be met) or too hard (will never be met)? <br> d) Do you feel that on targets that all groups receive the same degree of difficulty? Do some groups get easy targets? |
| **Performance clarity and comparability** | 12 | Monitoring | a) What are your targets (i.e. do they know them exactly)? Tell me about them in full. <br> b) Does everyone know their targets? Does anyone complain that the targets are too complex? <br> c) How do people know about their own performance compared with other people's performance? |
| **Managing human capital** | 13 | Targets | a) Do senior managers discuss attracting and developing talented people? <br> b) Do senior managers get any rewards for bringing in and keeping talented people in the company? <br> c) Can you tell me about the talented people you have developed within your |

team? Did you get any rewards for this?

| | | | |
|---|---|---|---|
| **Rewarding high performance** | 14 | Incentives | a) How does your appraisal system work? Tell me about the most recent round.<br>b) How does the bonus system work?<br>c) Are there any non-financial rewards for top performers? |
| **Removing poor performers** | 15 | Incentives | a) If you had a worker who could not do his job what would you do? Could you give me a recent example?<br>b) How long would underperformance be tolerated?<br>c) Do you find any workers who lead a sort of charmed life? Do some individuals always just manage to avoid being fixed/fired? |
| **Promoting high-performers** | 16 | Incentives | a) Can you rise up the company rapidly if you are really good? Are there any examples you can think of?<br>b) What about poor performers – do they get promoted more slowly? Are there any examples you can think of?<br>c) How would you identify and develop (i.e. train) your star performers?<br>d) If two people both joined the company five years ago and one was much better than the other would he/she be promoted faster? |
| **Attracting human capital** | 17 | Incentives | a) What makes it distinctive to work at your company as opposed to your competitors?<br>b) If you were trying to sell your firm to me how would you do this (get them to try to do this)?<br>c) What don't people like about working in your firm? |
| **Retaining human capital** | 18 | Incentives | a) If you had a star performer who wanted to leave what would the company do?<br>b) Could you give me an example of a star performer being persuaded to stay after wanting to leave?<br>c) Could you give me an example of a star performer who left the company without anyone trying to keep them? |

## TABLE A2: Management practice interview guide and example responses for 4 of the 18 practices

**Any score from 1 to 5 can be given, but the scoring guide and examples are only provided for scores of 1, 3 and 5. Multiple questions are used for each dimension to improve scoring accuracy.**

**Practice 3: Process problem documentation (Operations)**

| | Score 1 | Score 3 | Score 5 |
|---|---|---|---|
| **Scoring grid:** | No, process improvements are made when problems occur. | Improvements are made in weekly workshops involving all staff, to improve performance in their area of the plant. | Exposing problems in a structured way is integral to individuals' responsibilities and resolution occurs as a part of normal business processes rather than by extraordinary effort/teams. |
| **Examples:** | A US firm has no formal or informal mechanism in place for either process documentation or improvement. The manager admitted that production takes place in an environment where nothing has been done to encourage or support process innovation. | A US firm takes suggestions via an anonymous box, they then review these each week in their section meeting and decide any that they would like to proceed with. | The employees of a German firm constantly analyse the production process as part of their normal duty. They film critical production steps to analyse areas more thoroughly. Every problem is registered in a special database that monitors critical processes and each issue must be reviewed and signed off by a manager. |

**Practice 4: Performance tracking (Monitoring)**

| | Score 1 | Score 3 | Score 5 |
|---|---|---|---|
| **Scoring grid:** | Measures tracked do not indicate directly if overall business objectives are being met. Tracking is an ad-hoc process (certain processes are not tracked at all). | Most key performance indicators are tracked formally. Tracking is overseen by senior management. | Performance is continuously tracked and communicated, both formally and informally, to all staff using a range of visual management tools. |
| **Examples:** | A manager of a US firm tracks a range of measures when he does not think that output is sufficient. He last requested these reports about eight months ago and had them printed for a week until output increased again. Then he stopped and has not requested anything since. | At a US firm every product is bar-coded and performance indicators are tracked throughout the production process; however, this information is not communicated to workers. | A US firm has screens in view of every line. These screens are used to display progress to daily target and other performance indicators. The manager meets with the shop floor every morning to discuss the day past and the one ahead and uses monthly company meetings to present a larger view of the goals to date and strategic direction of the business to employees. He even stamps napkins with key performance achievements to ensure everyone is aware of a target that has been hit. |

**Practice 11: Targets are stretching (Targets)**

| | Score 1 | Score 3 | Score 5 |
|---|---|---|---|
| **Scoring grid:** | Goals are either too easy or impossible to achieve; managers provide low estimates to ensure easy goals. | In most areas, top management pushes for aggressive goals based on solid economic rationale. There are a few 'sacred cows' that are not held to the same rigorous standard. | Goals are genuinely demanding for all divisions. They are grounded in solid economic rationale. |
| **Examples:** | A French firm uses easy targets to improve staff morale and encourage people. They find it difficult to set harder goals because people just give up and managers refuse to work people harder. | A chemicals firm has two divisions, producing special chemicals for very different markets (military, civil). Easier levels of targets are requested from the founding and more prestigious military division. | A manager of a UK firm insisted that he has to set aggressive and demanding goals for everyone – even security. If they hit all their targets he worries he has not stretched them enough. Each KPI is linked to the overall business plan. |

**Practice 16: Promoting high-performers (Incentives)**

| | Score 1 | Score 3 | Score 5 |
|---|---|---|---|
| **Scoring grid:** | People are promoted primarily on the basis of tenure. | People are promoted on the basis of performance. | We actively identify, develop and promote our top performers. |
| **Examples:** | A UK firm promotes based on an individual's commitment to the company, measured by experience. Hence, almost all employees move up the firm in lock-step. Management was afraid to change this process because it would create bad feeling among the older employees who were resistant to change. | A US firm has no formal training programme. People learn on the job and are promoted based on their performance on the job. | At a UK firm each employee is given a red light (not performing), amber light (doing well and meeting targets), a green light (consistently meeting targets/very high performer) and a blue light (high-performer capable of promotion of up to two levels). Each manager is assessed every quarter based on his succession plans and development plans for individuals. |

NOTE: The full set of scoring and examples can be found in Bloom and Van Reenen [2006]

# APPENDIX B: DATA

*B.1: Survey data*

**The survey sampling frame**

Our sampling frame was based on the BVD Amadeus dataset for Europe (France, Germany, Greece, Italy, Poland, Portugal and the UK); on BVD Icarus for the US, on Centre for Monitoring Indian Economy (CMIE) Firstsource dataset for India, and on the BVD Oriana dataset for China and Japan. These databases all provide sufficient information on companies to conduct a stratified telephone survey (company name, address and a size indicator). These databases also typically have some accounting information, such as employment, sales of capital assets, etc. However, apart from size, we did not insist on having accounting information to form the sampling population.

Amadeus and Firstsource are constructed from a range of sources, primarily the national registries of companies (such as Companies House in the UK and the Registry of Companies in India). Icarus is constructed from the Dun & Bradstreet database, which is a private database of over 5 million US trading locations built up from credit records, business telephone directories and direct research. Oriana is constructed from the databases of Huaxia Credit in China and Teikoku Databank in Japan, covering all public and private firms with one of the following: 150 or more employees, US$ 10 million of sales or US$ 20 million of assets.

In every country the sampling frame was all firms with a manufacturing primary industry code and between 100 and 5,000 employees on average over the most recent three years of data (typically 2002 to 2004)[19]. In Japan and China we used all manufacturing firms with 150 to 5,000 employees since Oriana only samples firms with over 150 employees[20]. In Portugal, the population of firms with 100 to 5,000 employees was only 242, so we supplemented this with the 72 firms with 75 to 100 employees. We checked the results by conditioning on common size bands (above 150 in all countries). Interviewers were each given a randomly selected list of firms from the sampling frame, which further analysis in Bloom, Genakos, Martin et al. [2008] confirms.

In addition to randomly surveying from the sampling frame described above we also tried to resurvey the firms we interviewed in the 2004 survey wave used in Bloom and Van Reenen [2007]. This was a sample of 732 firms from France, Germany, the UK and the US, with a manufacturing primary industry code and 50 to 10,000 employees (on average during the period 2000 to 2003). This sample was drawn from the Amadeus dataset for Europe and Standard & Poor's Compustat dataset for the US. Only companies with accounting data were selected. Therefore, for the UK and France this sampling frame was very similar to the 2006 sampling frame. For Germany, it is more heavily skewed towards publicly quoted firms since smaller privately held firms do not report balance sheet information. For the US, it comprised only

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[19] In the US only the most recent year of employment is provided. In India employment is not reported for private firms, so for these companies we used forecast employment, predicted from their total assets (which are reported) using the coefficients from regressing log (employees) on log (assets) for public firms.

[20] Note that the Oriana database does include firms with less than 150 employees if they meet the sales or assets criteria, but we excluded this to avoid using a selected sample.

publicly quoted firms. As a result, when we present results we always include controls for firm size. As a robustness test we drop the firms that were resurveyed from 2004. These resurveyed firms were randomly distributed among the relevant country interviewers.

**The survey response rate**

Of the firms we contacted 44.9% took part in the survey: a high success rate given the voluntary nature of participation. Of the remaining firms, 16.8% refused to be surveyed and the remaining 38.3% were in the process of being scheduled when the survey ended. The reason for this high share of 'scheduling in progress' firms was the need for interviewers to keep a portfolio of firms that they cycle through when trying to set up interviews. Since interviewers only ran an average of 2.8 interviews a day the majority of their time was spent trying to contact managers to schedule future interviews. For scheduling it was efficient for interviewers to keep a stock of between 100 and 500 firms to cycle through. The optimal level of this stock varied by country – in the US and UK many managers operated voicemail, so large stocks of firms were needed. In Japan, after two weeks the team switched from working Japanese hours (midnight to 08.00) to Japanese afternoons and UK mornings (04.00 till midday), which left large stocks of contacted firms in Japan[21]. In Continental Europe, in contrast, managers typically had personal assistants rather than voicemail, who wanted to see government endorsement materials before connecting interviewers with the managers, and therefore each approach was more time-consuming, requiring a smaller stock of firms.

The ratio of successful interviews to rejections (ignoring 'scheduling in progress') is above 1 in every country. Hence, managers typically agreed to the survey proposition when interviewers were able to connect with them. This agreement ratio is lowest in China and Japan. There were two reasons for this: first, the Chinese and Japanese firms did appear to be genuinely more likely to refuse to be interviewed; and second, time zone differences meant that our interviewers could not call during the Chinese or Japanese morning, which sometimes led to rejections if managers were too busy to talk in the afternoon.

We also find (detailed in Bloom, Genakos, Martin et al. [2008]) that the decision to accept the interview proposition is uncorrelated with revenues per worker, listing status of the firm or firm age. Large firms and multinationals did appear to be more predisposed to accepting the interview proposition, although the size of this effect is not large – multinationals were about seven percentage points more likely to agree to the interview, and firms about four percentage points more likely for each doubling in size. The likelihood of managers accepting the interview proposition did not rise significantly through the survey. Finally, compared with the US only four countries had a significantly higher conditional acceptance rate – France, Greece, Italy and Poland – while none had a significantly lower acceptance rate.

*B.2: Firm-level data*

Our firm accounting data on sales, employment, capital, profits, shareholder equity, long-term debt, market values (for quoted firms) and wages (where available) came from the BVD Amadeus

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[21] After two weeks of the Japanese team working midnight to 08.00 it became clear this schedule was not sustainable due to the unsociability of the hours, with one of the Japanese interviewers resigning. The rest of the team then switched to working 04.00 until noon.

dataset for Europe (France, Germany, Greece, Italy, Poland, Portugal and the UK), the BVD Icarus dataset for the US, the CMIE Firstsource dataset for India, and the BVD Oriana dataset for China and Japan.

### B.3: Industries and industry-level data

Our basic industry code is the US Standard Industrial Classification (SIC) 1997 three-digit level – which is our common industry definition in every country. We allocate each firm to its main three-digit sector (based on sales). For the 3,601 firms in the sample we have 134 unique three-digit industries. There are at least 10 sampled firms in each industry for 96.9% of the sample.

The 'Lerner index of competition' constructed, as in Aghion et al. [2005], as the mean of (1 – profit/sales) in the entire database (excluding the surveyed firms themselves) for every country industry pair. Profits are defined as EBIT (earnings before interest and taxation) to include the costs of labour, materials and capital but excluding any financing or tax costs. The five-year period 2000 to 2004 is used in every country to ensure comparability across countries (since earlier data are not available in Oriana). In the US and India private firms do not provide profits data so the index was constructed from the population of all publicly listed firms, obtained from Compustat for the US and the CMIE Prowess dataset for India.

### B.4: Data descriptive statistics

A set of descriptive statistics broken down by country is in Table B1. We have 3,902 firms with 4,038 observations, since 136 firms were interviewed twice. There are also a few missing values for some control variables (for example, the percentage of employees with a degree). In these cases we set the value of the control variable equal to zero when it was missing and include an additional dummy variable to indicate this. However, the results are robust to dropping missing values entirely.

# TABLE B1: The survey sample descriptive statistics

| | All | CN | FR | GE | GR | IN | IT | JP | PO | PT | SW | UK | US | Missing, # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Observations, # | 4,038 | 325 | 323 | 348 | 187 | 470 | 204 | 122 | 239 | 177 | 286 | 649 | 694 | n/a |
| Firms, # | 3,902 | 319 | 313 | 308 | 187 | 467 | 207 | 121 | 239 | 177 | 259 | 609 | 682 | n/a |
| Firms, excluding 2004 resurvey, # | | | 242 | 225 | | | | | | | | 560 | 535 | n/a |
| Firm employees (median) | 270 | 700 | 240 | 500 | 230 | 250 | 185 | 310 | 250 | 183 | 267 | 250 | 375 | 0 |
| Firm employees, excluding 2004 resurvey | | | 200 | 325 | | | | | | | | 250 | 300 | n/a |
| Plant employees (median) | 150 | 500 | 150 | 225 | 120 | 150 | 150 | 150 | 150 | 125 | 150 | 140 | 150 | 0 |
| Production sites (median), # | 2 | 1 | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 94 |
| Age of firm (median, years) | 34 | 12 | 39 | 40 | 32 | 22 | 33 | 57 | 31 | 35 | 62 | 34 | 33 | 101 |
| Listed firm, % | 14.5 | 6.4 | 4.6 | 16.4 | 18.7 | 26.2 | 1.4 | 28.3 | 2.3 | 5.6 | 1.7 | 6.5 | 30.1 | 121 |
| Share of workforce with degrees, % | 17.3 | 8 | 17.3 | 14.9 | 11.9 | 22.0 | 16.3 | 30.9 | 20.0 | 9.6 | 19.8 | 12.9 | 20.1 | 436 |
| Management (mean) | 2.99 | 2.61 | 2.99 | 3.18 | 2.64 | 2.54 | 3.00 | 3.15 | 2.88 | 2.73 | 3.15 | 3.00 | 3.31 | 0 |
| Trust (%) | 38 | 65 | 17 | 33 | 15 | 39 | 40 | 43 | 31 | 16 | 72 | 36 | 42 | 48 |
| 1-Lerner index | .957 | .950 | .965 | .949 | .935 | .923 | .965 | .966 | .967 | .972 | .980 | .968 | .940 | 111 |
| % of foreign MNEs | 0.25 | 0.20 | 0.46 | 0.31 | 0.19 | 0.10 | 0.25 | 0.03 | 0.35 | 0.18 | 0.44 | 0.38 | 0.14 | 0 |
| % of domestic MNEs | 0.22 | 0.01 | 0.34 | 0.36 | 0.13 | 0.02 | 0.22 | 0.32 | 0.04 | 0.20 | 0.39 | 0.25 | 0.33 | 0 |
| Interview duration (minutes) | 47.9 | 48.6 | 46.3 | 44.7 | 49.8 | 59.8 | 46.6 | 58.4 | 47.8 | 54.5 | 56.3 | 43.5 | 46.8 | 34 |

Notes: All=All countries combined, CN=China, FR=France, GE=Germany, GR=Greece, IN=India, IT=Italy, JP=Japan, PO=Poland, PT=Portugal, SW=Sweden, UK=United Kingdom, US=United States.

# Figure 1: Internal validation of management practice score consistency within firms



Note: The figure plots the average score across all 18 questions for the 1st and 2nd interviews on a set of 222 firms. These double-interviews on the same firms had a different interviewee and interviewer for both interviews, with the two interviews run independently.
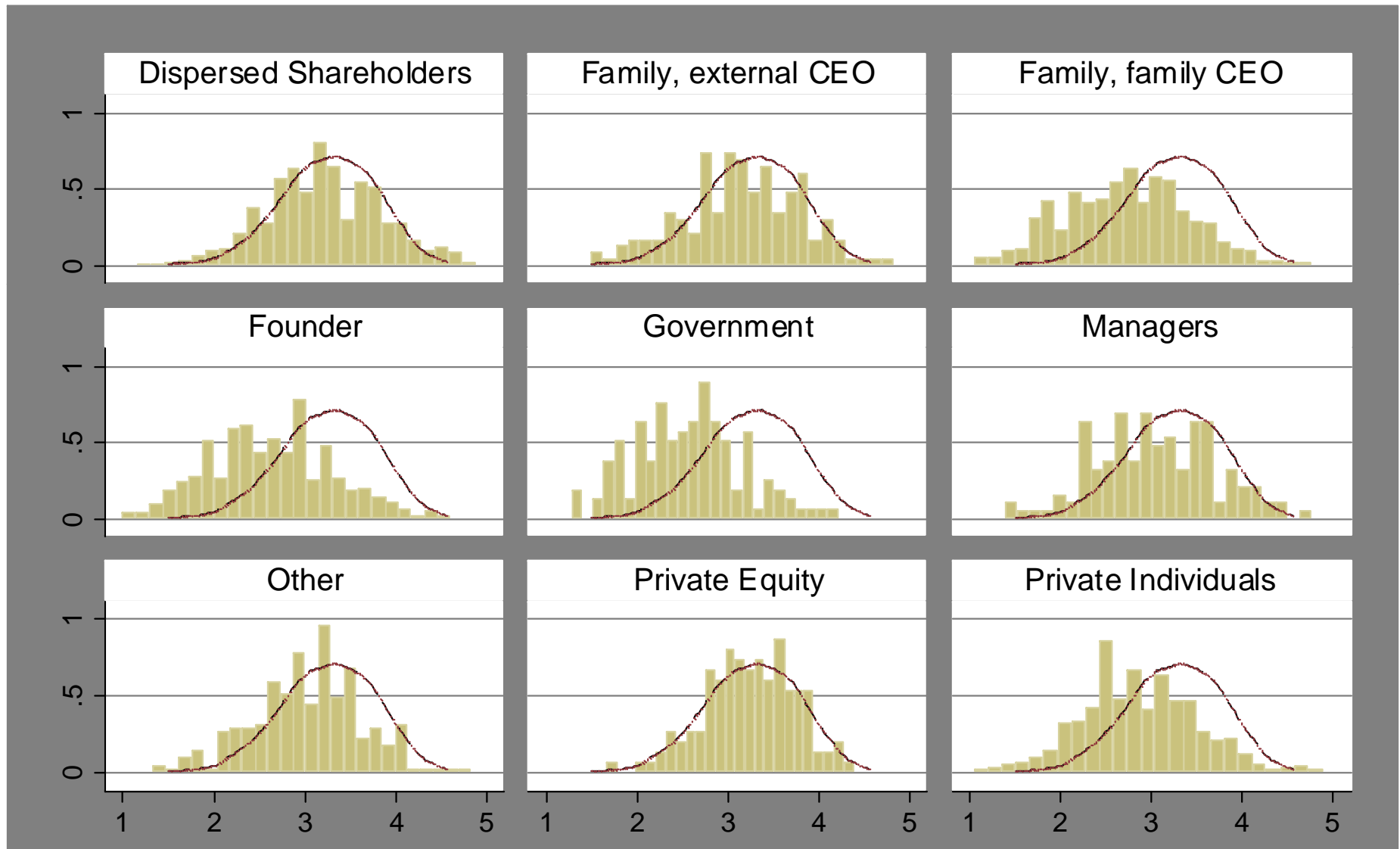
# Figure 2: Private equity owned firms have the best raw management practice scores on average

**Average score on 18 management practice questions**



| | Number of firms |
|---|---|
| ■ Management | 134 |
| ■ Management (same ownership 3+ years) | |

- Government — 134
- Founder — 635
- Family, family CEO — 722
- Private Individuals — 625
- Other — 290
- Managers — 138
- Family, external CEO — 174
- Dispersed Shareholders — 1357
- Private Equity — 137

2

Note: Sample of 4,221 medium-sized manufacturing firms. The bottom bar-chart only covers the 3696 firms which have been in the same ownership for the last 3 years. The "Other" category includes venture capital, joint-ventures, charitable foundations and unknown ownership.

# Figure 3: Private equity owned firms high average scores reflect their small tail of badly managed firms

**Distribution of firm management scores by ownership. Overlaid dashed line is the PE kernel density**



Note: Sample of 4,221 medium-sized manufacturing firms.