CENTRE for ECONOMIC PERFORMANCE

WORK LIFE BALANCE, MANAGEMENT PRACTICES AND PRODUCTIVITY

Nick Bloom, Toby Kretschmer and John Van Reenen

We would like to thank the ***Anglo-German Foundation****, the* ***Economic and Social Research Council*** *and the* ***Advanced Institute of Management Research*** *for their generous financial support.*

Work-Life Balance, Management Practices and Productivity

Nick Bloom[1] , Tobias Kretschmer[2] and John Van Reenen[3]

January 2006

[1]Dept. Economics, Stanford & Centre for Economic Performance, London School of Economics
[2]Dept. Management & Centre for Economic Performance, London School of Economics
[3]Dept. Economics & Centre for Economic Performance, London School of Economics

Abstract

Do "Anglo-Saxon" management practices generate higher productivity only at the expense of lousy work-life balance (WLB) for workers? Many critics of "neo-libéralisme sauvage" have argued that increased competition from globalisation is damaging employees' quality of life. Others have argued the opposite that improving work-life balance is actually a competitive tool that companies can use to raise productivity. We try to shed some empirical light on these issues using an innovative survey tool to collect new data on *management* and *work-life balance practices* from 732 medium sized manufacturing firms in the US, France, Germany and the UK. First, we show that our measure of work-life balance is a useful summary of a range of policies in the firm – family-friendly policies, flexible working, shorter hours, more holidays, subsidised childcare, etc. We show that this work-life balance measure is significantly associated with better management. Firms in environments that are more competitive and/or who are more productive, however, do not have significantly worse work-life balance for their workers. These findings are inconsistent with the view that competition, globalisation and "Anglo-Saxon" management practices are intrinsically bad for the work-life balance of workers. On the other hand, neither are these findings supportive of the optimistic "*win-win*" view that work-life balance improves productivity in its own right. Rather we find support for a "hybrid" theory that work-life balance is a choice for managers that is compatible with low or high productivity.

Keywords: Work-life balance, family-friendly work practices, management practices, productivity, competition.

Contact details: n.bloom@lse.ac.uk; t.kretschmer@lse.ac.uk; j.vanreenen@lse.ac.uk

Acknowledgements: Our partnership with Stephen Dorgan, John Dowdy and Tom Rippin has been invaluable for the project. We would like to thank the **Anglo-German Foundation,** the **Economic and Social Research Council** and the **Advanced Institute of Management Research** for their generous financial support.

EXECUTIVE SUMMARY

As unemployment in the UK has fallen to historically low levels, policy and media attention has focused more on the quality of work rather than just the quantity of jobs. This focus has sharpened as female workforce participation has steadily increased and issues of work-life balance (WLB) and family-friendly policies have risen up on the political agenda. Many of these debates have focused around the important issue of equity at work. However, what are the economic effects of changing WLB practices and how do they relate to firm productivity and management more generally?

To dig deeper into this puzzle we crudely characterise two opposing views on WLB-enhancing practices – the "*Chirac*" theory and the "*win-win*" theory. The *Chirac* theory argues that Anglo-Saxon "neo-liberalism" encapsulated by tougher product market competition and globalisation has undesirable consequences. Although these forces will raise productivity, they come at the expense of misery for workers in the form of poor WLB (long hours, job insecurity, intense and unsatisfying work). The *win-win* theory in contrast argues that better WLB will improve productivity; and employers are making the mistake of failing to treat their workers as assets by implementing better WLB policies. The present UK government is closer to the *win-win* view and has introduced more generous provisions for maternity and paternity leave, for example.

In our study, we find evidence for a hybrid view between these two polar extremes. Using originally collected data on WLB measures and management practices on over 700 firms in Europe and the US, we first find that the *Chirac* hypothesis is not supported by the data – <u>there is a positive association between overall management quality and work-life balance</u>. That is, better-managed firms provide a better WLB for their employees. Similarly, the hypothesis that competition and globalisation are bad for workers' WLB also receives little support: <u>There is no relationship between competition and work-life balance. In addition, larger firms – which are typically more globalised – typically have better WLB practices.</u>

However, the *win-win* view that WLB will improve productivity also received little empirical support: <u>there is no systematic relationship between productivity and WLB</u> once good management is accounted for.

We consequently find some support for the third "hybrid" theory where "good management" and work-life balance are neither straightforward substitutes for each other nor strictly complementary. If firms do introduce better WLB this neither penalises them in terms of productivity (as suggested by the *Chirac* theory), nor does it significantly reward them (as claimed by the *win-win* view). On average, they are neutral.

This may suggest that improving WLB is socially desirable – workers obviously like it and firm productivity does not suffer. However, our results do not give a green light for policy-makers to regulate more WLB. Even if *productivity* does not fall, WLB is costly to implement and maintain, and may result in significantly lower *profitability*. Any proposed changes to WLB policies need to take these additional costs on firms into account.

I. INTRODUCTION

Does "good management"[1] and higher productivity come at the expense of work-life balance (WLB), or is good work-life balance an important component of the management of successful firms?

Proponents of the "European social model" often support the first view, that unregulated firms will sacrifice workers' wellbeing in response to increasing globalisation and tougher competition. This view is reflected in statements by European politicians who see their social model under threat in the face of increased competition from within and outside the EU. For example, Gerhard Schröder, the former German Chancellor, stated that:

> *"Preserving social cohesion is also a European task, since people frequently see a unified European market […] as a Trojan Horse of increasing competition dissolving […] societal ties that are indispensable for productive coexistence."*[2]

Similarly, Jacques Chirac, the French president, stressed that:

> *"[Europe's] model is the social market economy, [the] alliance of liberty and solidarity, with the public authority safeguarding the public interest. […] France will therefore never let Europe become a mere free-trade area. We want a political and social Europe rooted in solidarity."*[3]

Conversely, a more optimistic "win-win" view is often justified by citing the tangible and intangible business benefits of good WLB.[4] Tony Blair, the UK Prime minister, for example stated:

> *"The UK has shown it is possible to have flexible labour markets combined with […] family friendly policies to help work/life balance […]. The result has been higher growth, higher employment and low unemployment."*[5]

Given the inability of Continental Europe to match US productivity growth and labour market performance since the mid-1990s[6] the question of the trade-off between job quality and competition has featured prominently when discussing reform strategies (e.g. around the Lisbon Agenda). There

---

[1] We will explain in detail below how we empirically measure good managerial quality as a combination of best practices based on shopfloor operations, targets, monitoring and people management. These tend to have an "Anglo-Saxon" flavour, but we will show they are key to better firm performance.

[2] Gerhard Schröder, "Auf die Kleinen ist Verlass", Die Zeit, 20/10/2005 (http://www.zeit.de/2005/43/ZukunftEuropa?page=all).

[3] Euractiv, "Blair, Chirac in drive to win citizens' support", 27/10/2005 (http://www.euractiv.com/Article?tcmuri=tcm:29-146484-16&type=News).

[4] See, for example, Employers for Work-Life Balance (http://www.employersforwork-lifebalance.org.uk/work/benefits.htm).

[5] Toby Helm and David Rennie, "Blair attack on "out-of-date" Chirac", Daily Telegraph, 25/03/2005 (http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2005/03/25/weu25.xml&sSheet=/news/2005/03/25/ixnewstop.html).

[6] See, for example, http://cep.lse.ac.uk/textonly/people/vanreenen/papers/productivity_mindthegap.pdf.

is a fear that market-oriented reforms may help productivity growth, but will undermine the work-life balance of employees.

Recent policy debates on European and national level have focused on issues surrounding or directly addressing issues of WLB and elements thereof. For example, the Working Time Directive has been under intense discussion recently, with several governments in Continental Europe challenging Britain's' right to opt-out of the maximum ceiling of 48 hours a week.[7] In addition, the European Commissions' proposed Services Directive is designed to open up the service sector of Member State to greater intra-EU competition in a hitherto sheltered sector. It has been stalled by opposition in France and Germany partly because of the claims that it will exert a heavy toll on the work-life balance of workers.

On both sides of the argument, there seem to be underlying empirical assumptions regarding the interaction between productivity and WLB. Unfortunately, the current econometric evidence is still limited in this area.[8] The question of WLB-enhancing practices, their implementation and effectiveness has recently been taken up by in the management literature. A crude generalisation of the findings would be:

i) WLB measures have a positive effect on firm or workplace performance[9]

ii) WLB measures are more effective in situations demanding high employee flexibility and responsiveness[10]

iii) Firms with a more skilled workforce are more likely to implement WLB-enhancing practices[11]

This leaves us with a dilemma: Policymakers are concerned that firms are failing to introduce sufficient measures to ensure a sensible work-life balance for their employees because the costs of doing this are too high in competitive global markets. On the other hand, the academic literature

[7] David Gow, "Britain faces EU showdown over renewal of working time opt-out ", The Guardian, 08/12/2005 (http://www.guardian.co.uk/eu/story/0,7369,1661880,00.html).

[8] For an overview of economic statistics relating to job quality see Green (2006).

[9] Delaney and Huselid, 1996, Huselid, Jackson and Schuler, 1997, Konrad and Mangel, 2000, Perry-Smith and Blum, 2000, Guthrie, 2001, Budd and Mumford, forthcoming, Gray, 2002.

[10] For example in high-technology industries (Arthur, 2003) or in highly differentiated firms (Lee and Miller, 1999, Guthrie et al., 2002, Youndt et al. 1996).

[11] Gray and Tudball (2003), Osterman (1995). The percentage of female employees has a weakly positive association with the implementation of WLB practices (Harel et al., 2003, Gray and Tudball, 2003, Miliken, Martins and Morgan, 1998, Martins, Eddleston and Veiga, 2002, Perry-Smith and Blum, 2000, Guthrie and Roth, 1999).

seems to believe all firms should be adopting positive WLB schemes given their apparently positive impact of firm performance, particularly in more competitive markets (where the value of speedy responses is presumably high).

Our study sheds light on these contrasting views using a new dataset on over 700 European and US firms, containing rich data on firm performance, management and WLB practices. As we show, many of the prior academic results disappear when controls for more general management practices are included in the analysis. Well-managed firms treat their employees better (higher WLB), hire staff that are more skilled and are highly productive. Without controls for management quality, a range of spurious results can therefore easily arise. In particular, the positive "effect" of WLB on productivity is not robust when we include a control for the overall quality of management (Bloom et al, 2005). We find that firms with good WLB are no more (or less) productive than those with poor WLB.

Our results need to be interpreted carefully, of course, as they are derived from a cross section of data and we are not able to evaluate the implementation of a policy. Identifying the direction of the arrow of causality between WLB, competition and productivity is therefore hazardous. Nevertheless, the conditional correlations we report caution against the simplistic pessimistic and optimistic models of WLB commonly heard in the debate.

In section II, we discuss our general models of management practices and firm performance. In section III, we provide a detailed discussion of our datasets and the procedures used to collect this. In section IV, we discuss our results and in section V, we provide some concluding comments. A detailed set of empirical appendices then follows.

II. MODELS

Based on the discussion above, we can characterize several "models" of WLB. Let us characterize two polar positions and one hybrid position. The first model we shall label (rather unfairly, given how crudely we will state the position) the "*Chirac*" theory after the current French president, and the second we will label the "*win-win*" theory.

The Chirac Theory

The critique of "neo-libéralisme sauvage" runs roughly as follows. The US (and to a lesser extent the UK) have achieved some economic success in recent years relative to the largest Continental European countries (France, Germany and Italy). This, it is alleged, is due to the unleashing of market forces that has toughened up competition in product markets (and labour and capital markets) through privatisation, trade liberalisation, the removal of state subsidies for national champions, etc. In Britain, this began under Mrs. Thatcher and has continued under Mr. Blair. Competition has fostered the use of "Anglo-Saxon management practices" that has helped increase productivity, but it has been at the expense of the quality of workers' lives both in the workplace and at home. Poor work-life balance arises from long and intense working hours with little flexibility. In short, the forces of globalisation that intensify competition should be resisted because better productivity should not come at the expense of the quality of life and social cohesion. Jacques Chirac and Gerhard Schröder's quotes in the introduction concisely outline this view.

Win-Win Theory

The alternative view is far more optimistic. Improving employee work-life balance helps bolster morale and enables firms to retain and attract better quality workers. For example, potential employees with children will not supply their labour to firms with poor WLB so such companies will miss a pool of potential talent. Why, then, do employers not adopt these good practices? It may be that some firms are simply badly managed and are making mistakes – as information spreads about the benefits of WLB this will change (or else the firms will be driven out of business). The government could have a role in information provision or, more radically, in forcing employers to do the "right thing". Alternatively, firms may know that improving WLB will increase productivity but they do not want to incur the costs of change. In other words, a firm currently running a low WLB strategy may not find it profitable to move to a high WLB strategy because of the costs of changing. Since having more WLB is good for people in general, it is then argued that the government needs to intervene to shift employers to a better "high WLB, high productivity" equilibrium.[12]

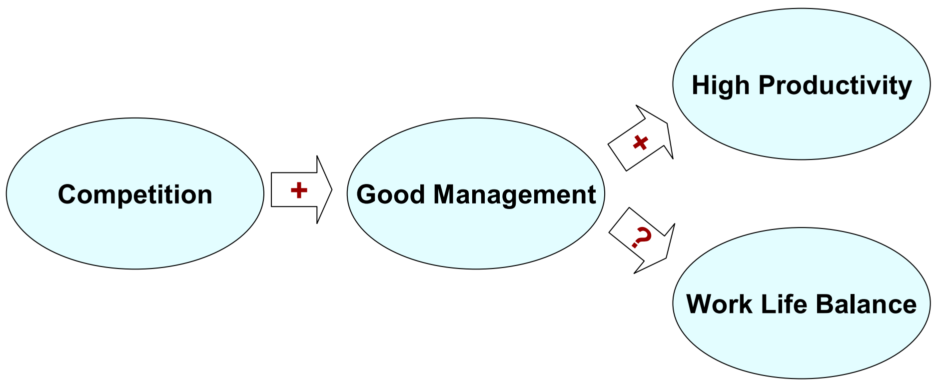
[12] Many of these arguments mirror those in favour of unions (e.g. Freeman and Medoff, 1984).

"Hybrid" Theory

A third, hybrid view, steers a middle course. Competition stimulates better management and productivity. Good managers may also be more likely to introduce better WLB, but WLB has no direct effect at all on productivity. Firms introduce WLB based on the relative costs and benefits depending on what goods they produce and the type of workers they seek to hire. Greater competition has no direct effect on WLB.

The flow diagram in figure 1 captures this intuition. If firms with better WLB also tend to have better management in general then a naïve regression of productivity on WLB would uncover a positive coefficient. This will be entirely spurious, however, as better productivity and WLB are due to the firm having higher managerial quality that is an unobserved variable. The only way to disentangle the relationship is to gather data on management quality in general.

Figure 1: "Hybrid" view of Competition, Management & WLB



To summarize, these three models provide a set of predictions laid out in Table 1 below, which we will subsequently take to the data.

Table 1: Correlations predicted by the different theories

	Theories		
Correlation of WLB and:	**Chirac**	**Win-Win**	**Hybrid**
Competition	Negative	Ambiguous	Ambiguous
Management	Negative	Positive	Ambiguous
Productivity	Negative	Positive	Zero

III. DATA

III.A Scoring WLB and Management Practices

Measuring WLB and management practices requires codifying these concepts into something widely applicable across different firms across the manufacturing sector. This is a hard task as WLB and good management are obviously tough to define. To do this we combined questions that have been used previously in: (i) the Workplace Employment Survey (WERS); (ii) a management practice evaluation tool developed by a leading international management consultancy firm; and (iii) the prior economics and management academic literature.

Work-Life Balance

In Appendix A2 we detail the Human Resources Interview Guide which was used to collect a range of detailed WLB practices and characteristics from firms. We collected three types of key data. (a) Workforce characteristic data on key variables including average employee age, hours, holidays and proportion female, plus a full set of conditioning variables on skills, training and unionization. (b) WLB policies data on key variables including childcare flexibility, home-working entitlements, part-time to full-time flexibility, job-sharing schemes and childcare subsidy schemes. (c) WLB perceptions data on individuals' view of their own firms WLB versus other firms in the industry. This will be our key WLB measure, which will be validated by showing its strongly significant links to both the workforce characteristics data and the WLB policies data. This question was defined as follows:

Question:	Relative to other companies in your industry how much does your company emphasize work-life balance?
Response choices (scoring):	Much less (1); Slightly less (2); The same (3); Slightly more (4); Much more (5)

In the empirical work reported, we use this as a continuous variable coded 1 through 5, but the results are robust to other statistical ways of treating the ordering[13] (e.g. using an ordered probit approach instead of OLS).

Management Practices

In Appendix A1, we detail the practices and the questions in the same order as they appeared in the survey, describe the scoring system and provide three anonymous responses per question. These practices can be grouped into four areas: *operations* (3 practices), *monitoring* (5 practices), *targets* (5 practices) and *incentives* (5 practices). The *operations management* section focuses on the introduction of lean manufacturing techniques, the documentation of process improvements and the rationale behind introductions of improvements. The *monitoring* section focuses on the tracking of the performance of individuals, reviewing performance (e.g. through regular appraisals and job plans), and consequence management (e.g. making sure that plans are kept and appropriate sanctions and rewards are in place). The *targets* section examines the type of targets (whether goals are simply financial or operational or more holistic), the realism of the targets (stretching, unrealistic or non-binding), the transparency of targets (simple or complex) and the range and interconnection of targets (e.g. whether they are given consistently throughout the organization). Finally, *incentives* (or people management) include promotion criteria, pay and bonuses, and fixing or firing bad performers, where best practice is deemed to be an approach that gives strong rewards for those with both ability and effort. A subset of the practices has similarities with those used in studies on HRM practices, such as Ichniowski, Shaw and Prenushi (1997) and Black and Lynch (2001).

Since the scaling may vary across practices in the econometric estimation, we convert the scores (from the 1 to 5 scale) to z-scores by normalising each practice to mean zero and standard deviation

[13] 50% of firms reported that their WLB was average (3, the middle category). There were 4% in the bottom category (1, much less than average), 12% in the second category (2, slightly less than average), 26% in the fourth category (4, slightly more than average) and 8% in the top category (5, much more than average). The bias towards exaggerating one's own WLB performance should not affect the statistical results if this measurement error is random across firms.

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 weightings schemes based on factor analytic approaches.

There is legitimate scope for 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 company accounts and the stock market.

III.B Collecting Accurate Responses

With this evaluation tool we can, in principle, provide some quantification of firms' WLB and management practices. However, an important issue is the extent to which we can obtain unbiased responses to questions from firms. In particular, will respondents provide accurate responses? As is well known in the surveying literature (see, for example, Bertrand and Mullainathan, 2001) a respondent's answer to survey questions is typically biased by the scoring grid and anchored towards those answers that they expect the interviewer to consider "correct". In addition, interviewers may themselves have pre-conceptions 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 they were being scored.[14] This enabled scoring to be based on the interviewer's evaluation of the actual firm practices, rather than the firm's aspirations, the manager's perceptions or the interviewer's impressions.[15] To run this "blind" scoring we used open questions (i.e. "can you tell me how you promote your employees"), rather than closed questions (i.e. "do you promote your employees on tenure [yes/no]?"). These questions target actual practices and examples, with the discussion continuing until the interviewer

---

[14] This survey tool has been passed by Stanford's Human Subjects Committee. The deception involved was deemed acceptable because it is: (i) <u>necessary</u> to get unbiased responses; (ii) <u>minimised</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 is confidential.

[15] If an interviewer could not score a question, it was left blank, with the firm average taken over the remaining questions. The average number of un-scored questions per firm was 1.3%, with no firm included in the sample if more than three questions were un-scored.

could make an accurate assessment of the firm's typical practices. Typically about three or four questions were needed to score each practice.

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 firm names and contact details to the interviewers (but no financial details). These smaller firms would typically 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, with a median age of twenty-eight and five years prior business experience in the manufacturing sector[16]. 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 targeted 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, a detailed set of information was also collected 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 (we can include individual interviewer-fixed effects, time-of-day and a subjective reliability score assigned by the interviewer). Some of these survey controls are significantly informative about the management score (see Table C1)[17], and when we use these as controls for interview noise in our econometric evaluations the coefficient on the management score typically increased (see Bloom and Van Reenen, 2005).

[16] Thanks to the interview team of Johannes Banner, Michael Bevan, Mehdi Boussebaa, Dinesh Cheryan, Alberic de Solere, Manish Mahajan, Simone Martin, Himanshu Pande, Jayesh Patel and Marcus Thielking.

[17] 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.

III.C Obtaining Interviews with Managers

The interview process took about 50 minutes on average, and was run from the London School of Economics. Overall, we obtained a response rate of 54%, which was achieved through four steps.

First, the interview was introduced as "a piece of work"[18] without discussion of the firm's financial position or its company accounts, making it relatively uncontroversial for managers to participate. Interviewers did not discuss financials 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, questions were ordered to lead with the least controversial (shop-floor management) and finish with the most controversial (pay, promotions and firings). The WLB questions were placed at the end of the interview to ensure the most candour in the response to this.

Third, interviewers' performance was monitored, as was the proportion of interviews achieved, so they were persistent in chasing firms (the median number of contacts each interviewer had per interview was 6.4). The questions are also about practices within the firm that any plant manager can respond to, so there are potentially several managers per firm who could be contacted[19].

Fourth, written endorsement of the Bundesbank (in Germany) and the Treasury (in the UK), and a scheduled presentation to the Banque de France, helped demonstrate to managers this was an important exercise with official support.

III.D 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 where employment ranged between 50 and 10,000 workers (with a median of 700). Very small firms have little publicly available data. Very large firms are likely to be more heterogeneous across plants, and it would be more difficult to get a picture of managerial performance in the firm as a whole from one or two plant interviews. We drew a sampling frame from each country to be representative of medium sized manufacturing firms and then randomly

[18] Words like "survey" or "research" should be avoided as these are used by switchboards to block market research calls.
[19] We found no significant correlation between the number, type and time-span of contacts before an interview is conducted and the management score. This suggests while different managers may respond differently to the interview proposition this does not appear to be directly correlated with their responses or the average management practices of the firm.

chose the order in which to contact firms (see Appendix B for details). We also excluded any clients of our partnering consultancy firm from our sampling frame[20].

Comparing the responding firms with those in the sampling frame, we found no evidence that the responders were systematically different to 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 where our firms were slightly larger than average than those in the sampling frame.

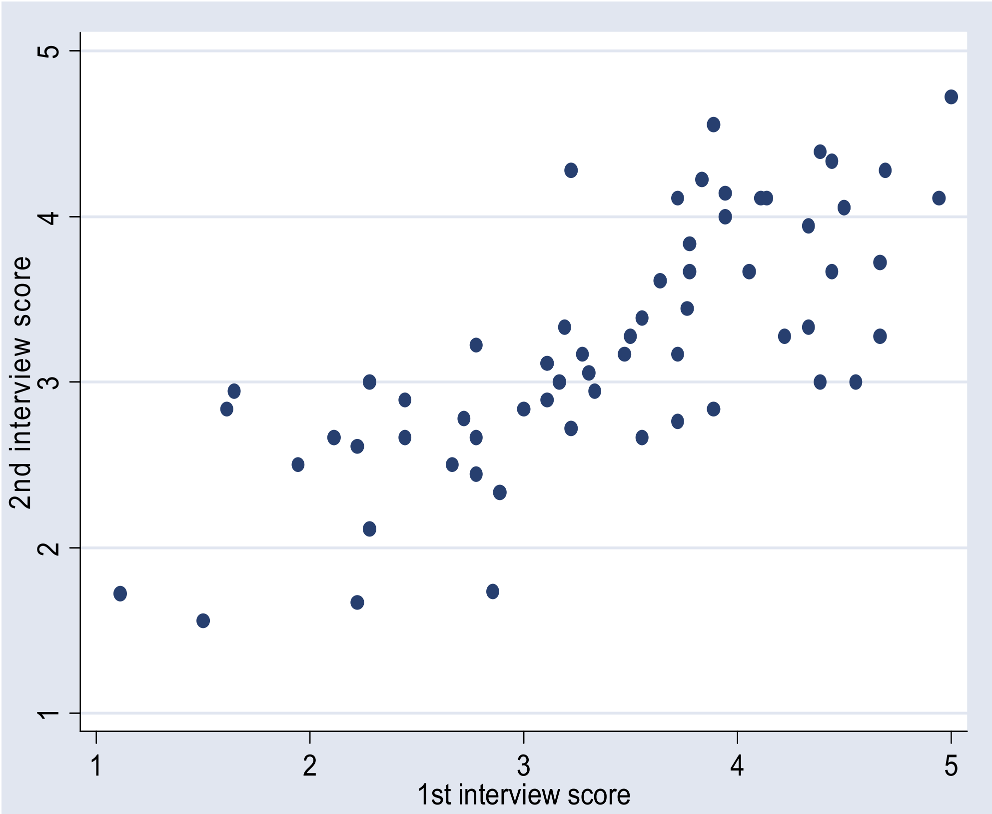
III.E Evaluating and Controlling for Potential Measurement Error

We could have measurement error in the WLB and management practice scores obtained using our survey tool. To quantify this we performed repeat interviews on management practice data on 64 firms, contacting different managers in the firm, typically at different plants, using different interviewers. To the extent that our measures are truly picking up general company-wide practices these two scores should be correlated, while to the extent that the measure is driven by noise the measures should be independent.

Figure 2 plots the average firm level management scores from the first interview against the second interviews, from which we can see that they are highly correlated (correlation 0.734 with p-value 0.000). Furthermore, there is no obvious (or statistically significant) relationship between the degree of measurement error 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 2 or above 4 on the 1-5 scale of composite management scores appear to be genuinely badly or well managed rather than extreme draws of sampling measurement error.

[20] This removed 33 firms out of our sampling frame of 1,353 firms

Figure 2: The Management Scoring Appears Reliable



Note: Scores from 64 repeat interviews on the same firm with different managers and different interviewers.

III.F Productivity and Competition Data

Quantitative information on firm sales, employment, capital, materials etc. came from the company accounts and proxy statements, and is used to calculate firm level productivity. The details are provided in Appendix B. To measure competition we follow Nickell (1996) and Aghion et al. (2005) in using three broad measures. The first measure is the degree of import penetration in the country by three-digit industry measured as the share of total inputs over domestic production. This is constructed for the period 1995-1999 to remove any potential contemporaneous feedback[21]. The second is the 3-digit SIC industry Lerner index of competition by country, which is (1 – profits/sales), calculated as the average across the entire firm level database (excluding each firm itself)[22]. Again, this is constructed for the period 1995-1999 to remove any potential contemporaneous feedback. The third measure of competition is the survey question on the number

[21] Melitz (2003) and others have suggested this measure of trade exposure should truncate the lower part of the productivity distribution. We have also looked at (Imports+Exports)/Production as an alternative indicator of trade exposure with similar results to those reported here.
[22] Note that in constructing this we draw on firms in the population database, not just those in the survey.

of competitors a firm faces (see Appendix A2), valued 0 for "no competitors", 1 for "less than 5 competitors", and 2 for "5 or more competitors"[23].

IV. RESULTS

The first thing we look at is whether our key measure of WLB is correlated with features of the firm that should "objectively" reflect better WLB. If this did not turn out to be true, we would suspect that the WLB measure was not really reflecting the actual events on the ground, but rather some other missing firm-specific characteristic.

IV.A Validating our Work-Life Balance Measure

Table 2 examines this issue by regressing the WLB perceptions indicator on a number of variables that we would expect to be associated with better work-life balance. Reassuringly we find that all the associations are sensible.

Column (1) simply correlates WLB with average hours worked per week in the firm. An extra 10 hours a week worked is associated with a 12% lower WLB score (about 0.4 lower than the mean of 3.21). This association is significant at the 5% level. In the second column, we control for country dummies, the size of the firm, whether the firm is publicly listed and the age of the firm. Large firms appear to have significantly better WLB than smaller firms. With the exception of the country dummies, all other variables are insignificant. The coefficient on managerial hours stays essentially the same. The next column splits hours into average hours worked by managers and average hours worked by non-managers. Both variables are negatively related to WLB at the 10% significance level or higher, suggesting WLB is related to the hours worked by *both* workers and managers.

Column (4) includes the number of days' holiday per year – more holidays are associated with a higher WLB score. Similarly, firms that are flexible and allow some working from home (column (5)), job switching (column (6)) and job sharing (column (7)) also have higher reported WLB. The next two columns show that firms who have "family-friendly" policies with regard to allowing flexibility for employees to take time off for children (column (8))[24] or offer childcare subsidies

[23] This question has been used by inter alia Nickell (1996) and Stewart (1990).

[24] This variable was in response to the question "*If an employee needed to take a day off at short notice due to child-care problems or their child was sick how they generally do this?*", and was ordered conceptually as: 1 = Not allowed; 2 = Allowed but unpaid; and 3 = Allowed and paid. Hence, we allocated the responses to the scores as

(column (9)) also score more highly on WLB. All of these correlations are significant and consistent with the notion that the WLB measure is picking up something real about the policies in the firm.

The final column includes the proportion of female managers in the regression. Firms who have a greater proportion of female managers are also more likely to report a higher WLB. This correlation is specifically related to the proportion of female managers, not females in the workplace as a whole. (the share of females in non-managerial positions is not correlated with WLB). This result could be due to a combination of factors: (i) more female managers will mean greater bargaining power for issues particularly important to women such as the childcare related parts of WLB, (ii) women are able to advance to more senior roles in firms with better WLB which support their home life and/or (iii) female managers are particularly attracted to better WLB firms.

Across all these specifications in Table 2 it is also worth noting that firm size is always significantly and positively correlated with work-life balance. This suggests large firms typically treat their employees better.[25]

IV.B Work-Life Balance and Management

Table 3 examines the correlation between WLB and our composite measure of good management described in the previous section. In previous work (e.g. Bloom et al, 2005) we have found this a reliable metric of the overall degree of managerial quality in the firm and the management score is strongly correlated with superior firm performance. Is it the case that firms who adopt these better "Anglo-Saxon" practices do so at the expense of employees' WLB? The evidence in Table 3 suggests not.

---

follows: A score of 1 for "Not Allowed" or "Never been asked"; a score of 2 for "Take as leave without pay" or "Take time off but make it up later" and a score of 3 for "Take as annual leave" or "Take as sick leave".

[25] Directly including a multi-national dummy, we observe a positive but insignificant coefficient.

TABLE 2: OUR WORK-LIFE BALANCE INDICATOR IS CORRELATED WITH FEATURES OF THE FIRM IN THE EXPECTED WAY

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**
Hours (all Employees)	-0.038** (0.012)	-0.037** (0.012)								
Hours (Managers)			-0.016** (0.008)							
Hours (Non-managers)			-0.023* (0.013)							
Days Holiday p.a.				0.026** (0.007)						
Working from Home allowed					0.286** (0.098)					
Job Switching allowed						0.185* (0.094)				
Job Sharing allowed							0.369** (0.151)			
Childcare flexibility								0.321** (0.094)		
Childcare subsidy									0.265** (0.106)	
Proportion of Female managers										0.005** (0.002)
Firm size,ln (employees)		0.104*** (0.036)	0.113*** (0.037)	0.113*** (0.038)	0.097*** (0.038)	0.079*** (0.037)	0.087*** (0.038)	0.109*** (0.036)	0.084*** (0.038)	0.111*** (0.037)
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firms	525	525	525	525	525	525	525	525	525	525

NOTES: In all columns, standard errors are in parentheses under coefficient estimates and allow for arbitrary heteroskedasticity ***=significant at the 1% level, **=significant at the 5% level, *=significant at the 10%level. **Controls** include country dummies, a dummy for public listing and the ln(age) of the firm.

In the first column of Table 3, we regress WLB on the average management score and nothing else. There is a strong positive and significant correlation between the two indices. Including the usual vector of control variables in the second column (size, age, four country dummies and listing status) does little to change this. The third column includes a more rigorous set of controls – the share of female managers and whether the firm is a subsidiary of a US or non-US multinational (these variables were insignificant). We also include a skills measure – the proportion of workers with degrees – which is significant at the 5% level. Hence, firms with more skilled workers also tend to have better work-life balance practices.

We then disaggregate our management measure into four components – operations, monitoring, targets and people management (incentives). Interestingly, the WLB measure is correlated with each of these when entered individually into the regression (columns (4) through (6)). When all four are included simultaneously in the regression it is the people management score that dominates, as we would expect given the focus of the WLB measure on people and lifestyle.

In Table 3, the final column further disaggregates the people management score into its five components. Three of these are "carrots" (related to good practices on promotion, recruiting and retaining talent) and two of these are "sticks" (dealing with the consequences of problems in appraisals by disciplining and in the final instance, firing). Unsurprisingly, the carrots are associated with a better WLB than the sticks.

TABLE 3: WORK-LIFE BALANCE IS ASSOCIATED WITH GOOD MANAGEMENT

	(1)	(2)	(3)	(4)	(5)	(6)	(6)	(7)	(8)
Dependent variable	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**	**Work-life Balance**
Management Score	0.192**	0.200**	0.175**						
	(0.056)	(0.062)	(0.065)						
Type of management:									
Operations				0.094*				-0.014	
				(0.046)				(0.070)	
Monitoring					0.114**			-0.062	
					(0.051)			(0.092)	
Targets						0.093*		-0.074	
						(0.049)		(0.079)	
People							0.263**	0.382**	
							(0.064)	(0.093)	
Type of people management:									
Developing talent									0.114**
									(0.055)
Employee value proposition									0.140**
									(0.051)
Performance based promotion									0.042
									(0.053)
Consequence management									-0.028
									(0.045)
Firing bad performers									-0.073
									(0.050)
Ln(% employees with degrees)			0.118**						
			(0.057)						
Ln(firm size)		0.067	0.080*						
		(0.041)	(0.041)						
Basic Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Full controls	No	No	Yes	No	No	No	No	No	No
Noise controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firms	521	521	521	521	521	521	521	521	521

NOTES: In all columns, standard errors are in parentheses under coefficient estimates and allow for arbitrary heteroskedasticity ***=significant at the 1% level, **=significant at the 5% level, *=significant at the 10%level. **Basic Controls** include country dummies, size, whether the firm is publicly listed and the ln(age) of the firm. **Full controls** include % female managers, US and non-US multinational status. **Noise controls** include a full set of interviewer dummies, seniority of the interviewee, a full set of day of the week controls, time local and time in the UK controls, interviewee's tenure in post, the number of countries he/she has worked in, their gender, and the duration of the interview.

IV.C Competition, Work-life Balance and Management

Having established the correlations of WLB with several factors, we now turn to the key hypotheses on product market competition and productivity. Our previous research has found that tougher product market competition is an important driver of higher productivity[26] and at least part of this seems to work through improving management practices (Bloom and Van Reenen, 2005). This is one reason for supporting moves towards deregulation and liberalisation as it improves firm performance. Nevertheless, does "neo-libéralisme sauvage" also destroy work-life balance and make workers miserable?

Table 4 examines this in detail. The first three columns report what we have shown elsewhere. Whether we measure competition by the degree of openness to imports (column (1)), the degree of "excess profit" in the industry (column (2)) or simply the number of competitors (column (3)), tougher competition appears to improve the average management score in the firm. The simplest interpretation of this association is Darwinian: tougher competition drives out the tail of badly managed companies[27].

The final three columns of the table present new results looking at the impact of product market competition on work-life balance. For each of the three measures of competition there appears to be a positive association with WLB, i.e. more competition is associated with better WLB. However, the standard errors are very large and none of the coefficients is significantly different from zero. We conclude that although competition seems to improve management, it does <u>not</u> seem to reduce WLB.

---

[26] On the relationship between productivity and competition see also *inter alia* Nickell (1996), Syverson (2004a,b), Blundell et al (1999) and Aghion et al (2005).

[27] There are alternative stories, of course. Tougher competition may give an added incentive for managers to work harder. However, we find no empirical evidence that employees (managers or workers) work longer *hours* in more competitive industries.

TABLE 4: WORK-LIFE BALANCE IS UNRELATED TO COMPETITION

	(1)	(2)	(3)	(4)	(5)	(6)
Estimation Method	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**
Dependent variable	**Management z-score**	**Management z-score**	**Management z-score**	**WLB (Work-life Balance)**	**WLB (Work-life Balance)**	**WLB (Work-life Balance)**
Import penetration (5-year lagged)	0.157** (0.078)			0.092 (0.071)		
Lerner index of competition (5-year lagged)		1.318** (0.588)			0.871 (0.829)	
Number of competitors			0.144** (0.045)			0.017 (0.075)
Firms	726	732	732	528	524	530
Country controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	No	No	No
Full controls	Yes	Yes	Yes	Yes	Yes	Yes

NOTES: Coefficients from OLS regressions with standard errors in parentheses (robust to arbitrary heteroskedasticity and clustered by country * industry pair); single cross-section. ***=significant at the 1% level, **=significant at the 5% level, *=significant at the 10%level. "**Country controls**" includes four country dummies. **"Full controls"** includes ln(firm size), ln(firm age), a dummy for being listed, the share of workforce with degrees, the share of workforce with MBAs, a dummy for being consolidated "**Import Penetration"** = ln(Import/Production) in every country industry pair. Average over 1995-1999 used. "**Lerner index of competition**" constructed, as in Aghion et al. (2005), as the mean of (1 - profit/sales) in the entire database (excluding the firm itself) for every country industry pair. "**Number of competitors"** constructed from the response to the survey question on number of competitors, and is coded as 0 for "*none*" (1% of responses), 1 for "*less than 5*" (51% of responses), and 2 for "*5 or more*" (48% of responses). Columns (4) through (6) include, and the "noise controls of column (2) in Table A2 (17 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 the day the interview was conducted, the duration of the interviews and an indicator of the reliability of the information as coded by the interviewer);

We also estimated the relationship between competition and the WLB-related measures examined in section IV.D – average hours worked per week, days holidays per year, working from home flexibility, job switching flexibility, flexibility for childcare time off and childcare subsidies – and found *no* significant relationships. In fact, these coefficients were positive in 12 of the 18 regressions, although typically with large standard-errors.[28] So we confirm the earlier conclusion that although competition seems to improve management, it does <u>not</u> seem to reduce any WLB practices.

In summary, while higher competition appears to increase management practices by removing the least productive firms from the market it does not seem to affect WLB. This is presumably because – as we show in the next section – WLB practices and productivity are unrelated, so that the Darwinian selection effects of competition have no bearing on typical WLB practices.

IV.D Productivity, Work-life Balance and Management

The final issue is the association of WLB with productivity. The *win-win* theory that is often trumpeted is that better WLB will lead to higher productivity. The *Chirac* hypothesis is that WLB and productivity represent a trade-off, with US firms appearing to be doing well only because they have sacrificed the WLB of their workers.

We address these issues in Table 5 showing the results from simple production functions where the dependent variable is the log of real sales. Because we control for the factor inputs (labour, capital and materials) the coefficient on WLB should be interpreted as the "effect" on (or more accurately, conditional correlation of WLB with) Total Factor Productivity (TFP). We must always remember the caveat that these are associations and we cannot simply infer the causal effect of WLB from these regressions.

[28] We estimated the Table 4 columns 1,2 and 3 specifications exchanging the WLB measure for: (i) average hours worked per week, (ii) days holidays per year, (iii) working from home flexibility, (iv) job switching flexibility, (v) flexibility for childcare time off and (vi) childcare subsidies. Results available on request for the authors.

TABLE 5: WORK-LIFE BALANCE IS UNRELATED TO PRODUCTIVITY

	(1)	(2)	(3)
Countries	**All**	**All**	**All**
Estimation	**OLS**	**OLS**	**OLS**
Dependent variable	**Ln (Y) $_{it}$ sales**	**Ln (Y) $_{it}$ sales**	**Ln (Y) $_{it}$ sales**
Work-life balance	0.031**	0.021	0.015
	(0.015)	(0.015)	(0.015)
Management z-score			0.053**
			(0.021)
ln (L) $_{it}$	0.491**	0.556**	0.541**
labour	(0.030)	(0.062)	(0.061)
Ln(K) $_{it}$	0.134**	0.125**	0.120**
capital	(0.027)	(0.043)	(0.043)
ln (Materials) $_{it}$,	0.378**	0.337**	0.344**
materials	(0.032)	(0.047)	(0.046)
Basic controls	Yes	Yes	Yes
Full controls	No	Yes	Yes
Firms	491	491	491

NOTES: In all columns, standard errors are in parentheses under coefficient estimates and allow for arbitrary heteroskedasticity. ***=significant at the 1% level, **=significant at the 5% level, *=significant at the 10%level. **Basic controls** include country and industry dummies, log (firm age), public listing and consolidated dummy. **Full control s** include % of workforce with degrees, % of employees with MBAs, % of employees female, US multinational dummy, non-US multinational dummy. It also includes a full set of country specific capital, materials and labour controls to allow these to vary across countries in reflection of potentially different accounting definitions of these factors. The coefficients for these factors with the Full Controls report the values for the UK that is the baseline country.

Column (1) of Table 5 reports the first specification that also includes country and industry dummies and basic firm characteristic controls. The association of WLB and productivity is positive and significant at the 5% level. The coefficient falls by about a third when we condition on a wider set of controls (skills, multinationals, listing, age) in the next column and becomes insignificant. In column (3), we also include the composite management score. As in previous work, this is positive and highly significant. Conditional on this management score the WLB balance coefficient falls by a further quarter to a value of less than half of its raw correlation.

This suggests that the significant association of WLB with productivity is spurious and arises because WLB is correlated with omitted variables – such as good management quality. Firms with better management practices will tend to have both higher productivity and better work-life balance. This gives rise (in column (1)) to the mistaken impression that better WLB causes higher productivity.

V. CONCLUSIONS

As unemployment in the UK has fallen to historically low levels, policy and media attention has focused more on the quality of work rather than just the quantity of jobs. This focus has sharpened as female workforce participation has steadily increased and issues of work-life balance (WLB) and family-friendly policies have risen up on the political agenda. Many of these debates have focused around the important issue of equity at work. However, what are the economic effects of changing WLB practices and how do they relate to firm productivity and management more generally?

To dig deeper into this puzzle we crudely characterised two opposing views on WLB-enhancing practices – the "*Chirac*" theory and the "*win-win*" theory. The *Chirac* theory argues that Anglo-Saxon "neo-liberalism" encapsulated by tougher product market competition and globalisation has undesirable consequences. Although these forces will raise productivity, they come at the expense of misery for workers in the form of poor WLB (long hours, job insecurity, intense and unsatisfying work). The *win-win* theory in contrast argues that better WLB will improve productivity; and employers are making the mistake of failing to treat their workers as assets by implementing better WLB policies. The present government sides more with the *win-win* view and has introduced more generous provisions for maternity and paternity leave, for example.

In our study, we find evidence for a hybrid view between these two polar extremes. Using originally collected data on WLB measures and management practices on over 700 firms in Europe and the US, we first find that the *Chirac* hypothesis is not supported by the data – there is a positive association between overall management quality and work-life balance. That is, better-managed firms provide a better WLB for their employees. Similarly, the hypothesis that competition and globalisation are bad for workers' WLB also receives little support: There is no relationship between competition and work-life balance. Also, larger firms – which are typically more globalised – typically have better WLB practices.

However, the *win-win* view that WLB will improve productivity also received little empirical support: there is no systematic relationship between productivity and WLB once good management is accounted for.

We consequently find some support for the third "hybrid" theory where "good management" and work-life balance are neither straightforward substitutes for each other nor strictly complementary. If firms do introduce better WLB this neither penalises them in terms of productivity (as suggested by the *Chirac* theory), nor does it significantly reward them (as claimed by the *win-win* view). On average, they are neutral.

This may suggest that improving WLB is socially desirable – workers obviously like it and firm productivity does not inordinately suffer. Our results do not, however, give a green light for policy-makers to regulate more WLB. Even if *productivity* does not fall, WLB is costly to implement and maintain, and may result in significantly lower *profitability*. Any proposed changes to WLB policies need to weigh up these financial burdens on firms.

BIBLIOGRAPHY

Aghion, P., Bloom, N., Blundell, R., Griffith, R., and Howitt, P. (2005). "Competition and Innovation: An inverted U relationship." *Quarterly Journal of Economics*, 120, pp. 701-728.

Arthur, M. (2003). "Share Price Reactions to Work-Family Initiatives: An Institutional Perspective." *Academy of Management Journal*, 46, pp. 497-505.

Bartelsman, E., Becker, R. and Gray, W. (2000). "The NBER Manufacturing Productivity Database." *NBER*, Cambridge, MA.

Bertrand, M. and Mullainathan, S. (2001). "Do people mean what they say? Implications for subjective survey data." *American Economic Review Papers and Proceedings*, 91, pp. 67-72.

Black, S. and Lynch, L. (2001). "How to Compete: The Impact of Workplace Practices and Information Technology on Productivity." *Review of Economics and Statistics*, 83, pp. 434-445.

Bloom, N. and Van Reenen, J. (2005). "Measuring and Explaining Management practices across firms and countries" Centre for Economic Performance, LSE, mimeo

Bloom, N., Dorgan, S., Dowdy, J., Rippin, T. and Van Reenen, J. (2005). "Management Practices across firms and nations" Centre for Economic Performance, LSE, mimeo, http://cep.lse.ac.uk/management/

Blundell, R., Griffith, R. and Van Reenen, J. (1999). "Market share, market value and Innovation: Evidence from British Manufacturing Firms" *Review of Economic Studies*, 66, pp. 529-554

Bresnahan, T., Brynjolfsson, E. and Hitt, L. (2002). "Information Technology, Workplace Organization and the Demand for Skilled Labor: Firm-level Evidence", *Quarterly Journal of Economics*, 117, pp. 339-376.

Budd, J. and Mumford, K. (forthcoming). "Family-Friendly Work Practices in Britain: Availability and Effective Coverage." *Human Resource Management*, forthcoming.

Delaney, J. and Huselid, M. (1996). "The Impact of Human Resource Management Practices on Perceptions of Organizational Performance." *Academy of Management Journal*, 39, pp. 949-969.

Freeman , R. and Medoff, J. (1984). *What Do Unions Do?* Basic Books, New York.

Gray, H. (2002). "Family-Friendly Working: What a Performance! An Analysis of the Relationship between the Availability of Family Friendly Policies and Establishment Performance." *CEP Discussion Paper* No. 529.

Gray, M., and Tudball, J. (2003). "Family-Friendly Work Practices: Differences within and between Workplaces." *Journal of Industrial Relations*, 45, pp. 269-291.

Green, F. (2006). *Demanding Work: The Paradox of Job Quality in the Affluent Economy.* Princeton University Press, Princeton.

Guthrie, J. (2001). "High-Involvement Work Practices, Turnover, and Productivity: Evidence from New Zealand." *Academy of Management Journal*, 44, pp. 180-190.

Guthrie, J. and Roth, L. (1999). "The State, Courts and Maternity Policies in US Organizations: Specifying Institutional Arrangements." *American Sociological Review*, 64, pp. 41-63.

Guthrie, J., Spell, C., and Nyamori, R. (2002). "Correlates and Consequences of High Involvement Work Practices: The Role of Competitive Strategy." *International Journal of Human Resource Management*, 13, pp. 183-197.

Harel, G., Tzafrir, S., and Baruch, Y. (2003). "Achieving Organizational Effectiveness through Promotion of Women into Managerial Positions: HRM Practice Focus." *International Journal of Human Resource Management*, 14, pp. 247-263.

Huselid, M., Jackson, S. and Schuler, R. (1997). "Technical and Strategic Human Resource Management Effectiveness as Determinants of Firm Performance." *Academy of Management Journal*, 40, pp. 171-188.

Ichniowski, C., Shaw, K. and Prenushi, G. (1997). "The Effects of Human Resource Management: A Study of Steel Finishing Lines." *American Economic Review*, 87, pp.291-313

Konrad, A. and Mangel, R. (2000). "The Impact of Work-Life Programs on Firm Productivity." *Strategic Management Journal*, 21, pp. 1225-1237.

Lee, J. and Miller, D. (1999). "People Matter: Commitment to Employees, Strategy and Performance in Korean Firms." *Strategic Management Journal*, 20, pp. 579-593.

Manski, C. (2004). "Measuring expectations." *Econometrica*, 72, pp. 1329-1376.

Martins, L., Eddleston, K., and Veiga, J. (2002). "Moderators of the Relationship between Work-Family Conflict and Career Satisfaction." *Academy of Management Journal*, 45, pp. 399-409.

Melitz, M. (2003). “The impact of trade on intra-industry reallocations and aggregate productivity growth” *Econometrica*, 71, 1695-1725

Miliken, F., Martins, L., and Morgan, H. (1998). “Explaining Organizational Responsiveness to Work-Family Issues: The Role of Human Resource Executives as Issue Interpreters.” *Academy of Management Journal*, 41, pp. 580-592.

Nickell, S. (1996). “Competition and Corporate Performance.” *Journal of Political Economy*, 104, 724-746.

Osterman, P. (1995). “Work/Family Programs and the Employment Relationship.” *Administrative Science Quarterly*, 40, pp. 681-700.

Perry-Smith, J. and Blum, T. (2000). “Work-Family Human Resource Bundles and Perceived Organizational Performance.” *Academy of Management Journal*, 43, pp. 1107-1117.

Schuler, R. and MacMillan, I. (1984). “Gaining Competitive Advantage through Human Resource Practices.” *Human Resource Management*, 23, pp. 241-255.

Stewart, M (1990). “Union wage differentials, product market influences and the division of rents.” *Economic Journal*, 100, pp. 1122-1137.

Syverson, C. (2004a). “Market Structure and Productivity: A Concrete Example.” *Journal of Political Economy*, 112, pp. 1181-1222

Syverson, C. (2004b). “Product substitutability and Productivity Dispersion.” *Review of Economics and Statistics*, 86, pp. 534-50.

Youndt, M., Snell, S., Dean, J., and Lepak, D. (1996). “Human Resource Management, Manufacturing Strategy, and Firm Performance.” *Academy of Management Journal*, 39, pp. 836-866.

APPENDIX A1: MANAGEMENT PRACTICE INTERVIEW GUIDE AND EXAMPLE RESPONSES

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.

(1) Modern manufacturing, introduction

a) Can you describe the production process for me?
b) What kinds of lean (modern) manufacturing processes have you introduced? Can you give me specific examples?
c) How do you manage inventory levels? What is done to balance the line? What is the Takt time of your manufacturing processes?

	Score 1	Score 3	Score 5
Scoring grid:	Other than JIT delivery from suppliers few modern manufacturing techniques have been introduced, (or have been introduced in an ad-hoc manner)	Some aspects of modern manufacturing techniques have been introduced, through informal/isolated change programs	All major aspects of modern manufacturing have been introduced (Just-in-time, autonomation, flexible manpower, support systems, attitudes and behaviour) in a formal way
Examples:	A UK firm orders in bulk and stores the material on average 6 months before use. The business focuses on quality and not reduction of lead-time or costs. Absolutely no modern manufacturing techniques had been introduced.	A supplier to the army is undergoing a full lean transformation. For 20 years, the company was a specialty supplier to the army, but now they have had to identify other competencies forcing them to compete with lean manufacturers. They have begun adopting specific lean techniques and plan to use full lean by the end of next year.	A US firm has formally introduced all major elements of modern production. It reconfigured the factory floor based on value stream mapping and 5-S principles, broke production into cells, eliminated stockrooms, implemented Kanban, and adopted Takt time analyses to organize workflow.

(2) Modern manufacturing, rationale

a) Can you take through the rationale to introduce these processes?
b) What factors led to the adoption of these lean (modern) management practices?

	Score 1	Score 3	Score 5
Scoring grid:	Modern manufacturing techniques were introduced because others were using them.	Modern manufacturing techniques were introduced to reduce costs	Modern manufacturing techniques were introduced to enable us to meet our business objectives (including costs)
Examples:	A German firm introduced modern techniques because all its competitors were using these techniques. The business decision had been taken to imitate the competition.	A French firm introduced modern manufacturing methods primarily to reduce costs.	A US firm implemented lean techniques because the COO had worked with them before and knew that they would enable the business to reduce costs, competing with cheaper imports through improved quality, flexible production, greater innovation and JIT delivery.

(3) Process problem documentation

a) How would you go about improving the manufacturing process itself?
b) How do problems typically get exposed and fixed?
c) Talk me through the process for a recent problem.
d) Do the staff ever suggest process improvements?

	Score 1	Score 3	Score 5
Scoring grid:	No, process improvements are made when problems occur.	Improvements are made in one week 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.

(4) Performance tracking

a) Tell me how you track production performance?
b) What kind of KPI's would you use for performance tracking? How frequently are these measured? Who gets to see this KPI data?
c) If I were to walk through your factory could I tell how you were doing against your KPI's?

	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 aren't 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 8 months ago and had them printed for a week until output increased again.	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.

(5) Performance review

a) How do you review your KPI's?
b) Tell me about a recent meeting
c) Who is involved in these meetings? Who gets to see the results of this review?
d) What are the typical next steps after a meeting?

	Score 1	Score 3	Score 5
Scoring grid:	Performance is reviewed infrequently or in an un-meaningful way e.g. only success or failure is noted.	Performance is reviewed periodically with successes and failures identified. Results are communicated to senior management. No clear follow-up plan is adopted.	Performance is continually reviewed, based on indicators tracked. All aspects are followed up ensure continuous improvement. Results are communicated to all staff
Examples:	A manager of a US firm relies heavily on his gut feel of the business. He will review costs when he thinks there is too much or too little in the stores. He admits he is busy so reviews are infrequent. He also mentioned staffs feel like he is going on a hunt to find a problem, so he has now made a point of highlighting anything good.	A UK firm uses daily production meetings to compare performance to plan. However, clear action plans are infrequently developed based on these production results.	A French firm tracks all performance numbers real time (amount, quality etc). These numbers are continuously matched to the plan on a shift-by-shift basis. Every employee can access these figures on workstations on the shop floor. If scheduled numbers are not met, action for improvement is taken immediately.

(6) Performance dialogue

a) How are these meetings structured? Tell me about your most recent meeting.
b) During these meeting do you find that you generally have enough data?
c) How useful do you find problem solving meetings?
d) What type of feedback occurs in these meetings?

	Score 1	Score 3	Score 5
Scoring grid:	The right data or information for a constructive discussion is often not present or conversations overly focus on data that is not meaningful. Clear agenda is not known and purpose is not stated explicitly	Review conversations are held with the appropriate data and information present. Objectives of meetings are clear to all participating and a clear agenda is present. Conversations do not, as a matter of course, drive to the root causes of the problems.	Regular review/performance conversations focus on problem solving and addressing root causes. Purpose, agenda and follow-up steps are clear to all. Meetings are an opportunity for constructive feedback and coaching.
Examples:	A US firm does not conduct staff reviews. It was just "not the philosophy of the company" to do that. The company was very successful during the last decade and therefore did not feel the need to review their performance.	A UK firm focuses on key areas to discuss each week. This ensures they receive consistent management attention and everyone comes prepared. However, meetings are more of an opportunity for everyone to stay abreast of current issues rather than problem solve.	A German firm meets weekly to discuss performance with workers and management. Participants come from all departments (shop floor, sales, R&D, procurement etc.) to discuss the previous week performance and to identify areas to improve. They focus on the cause of problems and agree topics to be followed up the next week, allocating all tasks to individual participants.

(7) Consequence management

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?
b) What kind of consequences would follow such an action?
c) Are there are any parts of the business (or managers) that seem to repeatedly fail to carry out agreed actions?

	Score 1	Score 3	Score 5
Scoring grid:	Failure to achieve agreed objectives does not carry any consequences	Failure to achieve agreed results is tolerated for a period before action is taken.	A failure to achieve agreed targets drives retraining in identified areas of weakness or moving individuals to where their skills are appropriate
Examples:	At a French firm no action is taken when objectives aren't achieved. The President personally intervenes to warn employees but no stricter action is taken. Cutting payroll or making people redundant because of a lack of performance is very rarely done.	Management of a US firm reviews performance quarterly. That is the earliest they can react to any underperformance. They increase pressure on the employees if targets are not met.	A German firm takes action as soon as a weakness is identified. They have even employed a psychologist to improve behaviour within a difficult group. People receive ongoing training to improve performance. If this doesn't help they move them in other departments or even fire individuals if they repeatedly fail to meet agreed targets

(8) Target balance

a) What types of targets are set for the company? What are the goals for your plant?
b) Tell me about the financial and non-financial goals?
c) What do CHQ (or their appropriate manager) emphasize to you?

	Score 1	Score 3	Score 5
Scoring grid:	Goals are exclusively financial or operational	Goals include non-financial targets, which form part of the performance appraisal of top management only (they are not reinforced throughout the rest of organization)	Goals are a balance of financial and non-financial targets. Senior managers believe the non-financial targets are often more inspiring and challenging than financials alone.
Examples:	At a UK firm performance targets are exclusively operational. Specifically volume is the only meaningful objective for managers, with no targeting of quality, flexibility or waste.	For French firm strategic goals are very important. They focus on market share and try to hold their position in technology leadership. However, workers on the shop floor are not aware of those targets.	A US firm gives everyone a mix of operational and financial targets. They communicate financial targets to the shop floor in a way they found effective – for example telling workers they pack boxes to pay the overheads until lunchtime and after lunch it is all profit for the business. If they are having a good day the boards immediately adjust and play the "profit jingle" to let the shop floor know that they are now working for profit. Everyone cheers when the jingle is played.

(9) Target interconnection

a) What is the motivation behind your goals?
b) How are these goals cascaded down to the individual workers?
c) What are the goals of the top management team (do they even know what they are!)?
d) How are your targets linked to company performance and their goals?

	Score 1	Score 3	Score 5
Scoring grid:	Goals are based purely on accounting figures (with no clear connection to shareholder value)	Corporate goals are based on shareholder value but are not clearly communicated down to individuals	Corporate goals focus on shareholder value. They increase in specificity as they cascade through business units ultimately defining individual performance expectations.
Examples:	A family owned firm in France is only concerned about the net income for the year. They try to maximize income every year without focusing on any long term consequences.	A US firm bases its strategic corporate goals on enhancing shareholder value, but does not clearly communicate this to workers. Departments and individuals have little understanding of their connection to profitability or value with many areas labelled as "cost-centres" with an objective to cost-cut despite potentially disproportionately large negative impact on the other departments they serve.	For a US firm strategic planning begins with a bottom up approach that is then compared with the top down aims. Multifunctional teams meet every 6 months to track and plan deliverables for each area. This is then presented to the area head that then agrees or refines it and then communicates it down to his lowest level. Everyone has to know exactly how they contribute to the overall goals or else they won't understand how important the 10 hours they spend at work every day is to the business.

(10) Target time horizon

a) What kind of time scale are you looking at with your targets?
b) Which goals receive the most emphasis?
c) How are long term goals linked to short term goals?
d) Could you meet all your short-run goals but miss your long-run goals?

	Score 1	Score 3	Score 5
Scoring grid:	Top management's main focus is on short term targets	There are short and long-term goals for all levels of the organization. As they are set independently, they are not necessarily linked to each other	Long term goals are translated into specific short term targets so that short term targets become a "staircase" to reach long term goals
Examples:	A UK firm has had several years of ongoing senior management changes – therefore senior managers are only focusing on how the company is doing this month versus the next, believing that long-term targets will take care of themselves.	A US firm has both long and short-term goals. The long-term goals are known by the senior managers and the short-term goals are the remit of the operational managers. Operations managers only occasionally see the longer-term goals so are often unsure how they link with the short term goals.	A UK firm translates all their goals – even their 5-year strategic goals - into short-term goals so they can track their performance to them. They believe that it is only when you make someone accountable for delivery within a sensible timeframe that a long-term objective will be met. They think it is more interesting for employees to have a mix of immediate and longer-term goals.

(11) Targets are stretching

a) How tough are your targets? Do you feel pushed by them?
b) On average, how often would you say that you meet your targets?
c) Are there any targets which are obviously too easy (will always be met) or too hard (will never be met)?
d) Do you feel that on targets that all groups receive the same degree of difficulty? Do some groups get easy 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, 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 2 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.

(12) Performance clarity

a) What are your targets (i.e. do they know them exactly)? Tell me about them in full.
b) Does everyone know their targets? Does anyone complain that the targets are too complex?
c) How do people know about their own performance compared to other people's performance?

	Score 1	Score 3	Score 5
Scoring grid:	Performance measures are complex and not clearly understood. Individual performance is not made public	Performance measures are well defined and communicated; performance is public in all levels but comparisons are discouraged	Performance measures are well defined, strongly communicated and reinforced at all reviews; performance and rankings are made public to induce competition
Examples:	A German firm measures performance per employee based on differential weighting across 12 factors, each with its own measurement formulas (e.g. Individual versus average of the team, increase on prior performance, thresholds etc.). Employees complain the formula is too complex to understand, and even the plant manager could not remember all the details.	A French firm does not encourage simple individual performance measures as unions pressure them to avoid this. However, charts display the actual overall production process against the plan for teams on regular basis.	At a US firm self-directed teams set and monitor their own goals. These goals and their subsequent outcomes are posted throughout the company, encouraging competition in both target setting and achievement. Individual members know where they are ranked which is communicated personally to them bi-annually. Quarterly company meetings seek to review performance and align targets.

(13) Managing human capital

a) Do senior managers discuss attracting and developing talented people?
b) Do senior managers get any rewards for bringing in and keeping talented people in the company?
c) Can you tell me about the talented people you have developed within your team? Did you get any rewards for this?

	Score 1	Score 3	Score 5
Scoring grid:	Senior management **do not** communicate that attracting, retaining and developing talent throughout the organization is a top priority	Senior management believe and communicate that having top talent throughout the organization is a key way to win	Senior managers are evaluated and held accountable on the strength of the talent pool they actively build
Examples:	A US firm does not actively train or develop its employees, and does not conduct performance appraisals or employee reviews. People are seen as a secondary input to the production.	A US firm strives to attract and retain talent throughout the organization, but does not hold managers individually accountable for the talent pool they build. The company actively cross-trains employees for development and challenges them through exposure to a variety of technologies.	A UK firm benchmarks human resources practices at leading firms. A cross-functional HR excellence committee develops policies and strategies to achieve company goals. Bi-monthly directors' meetings seek to identify training and development opportunities for talented performers.

(14) Rewarding high-performance

a) How does you appraisal system work? Tell me about the most recent round?
b) How does the bonus system work?
c) Are there any non-financial rewards for top-performers?
d) How does your reward system compare to your competitors?

	Score 1	Score 3	Score 5
Scoring grid:	People within our firm are rewarded equally irrespective of performance level	Our company has an evaluation system for the awarding of performance related rewards	We strive to outperform the competitors by providing ambitious stretch targets with clear performance related accountability and rewards
Examples:	An East Germany firm pays its people equally and regardless of performance. The management said to us "there are no incentives to perform well in our company". Even the management is paid an hourly wage, with no bonus pay.	A German firm has an awards system based on three components: the individual's performance, shift performance, and overall company performance.	A US firm sets ambitious targets, rewarded through a combination of bonuses linked to performance, team lunches cooked by management, family picnics, movie passes and dinner vouchers at nice local restaurants. They also motivate staff to try by giving awards for perfect attendance, best suggestion etc.

(15) Removing poor performers

a) If you had a worker who could not do his job what would you do? Could you give me a recent example?
b) How long would underperformance be tolerated?
c) Do you find any workers who lead a sort of charmed life? Do some individuals always just manage to avoid being fixed/fired?

	Score 1	Score 3	Score 5
Scoring grid:	Poor performers are rarely removed from their positions	Suspected poor performers stay in a position for a few years before action is taken	We move poor performers out of the company or to less critical roles as soon as a weakness is identified
Examples:	A French firm had a supervisor who was regularly drinking alcohol at work but no action was taken to help him or move him. In fact no employee had ever been laid off in the factory. According to the plant manager HR "kicked up a real fuss" whenever management wanted to get rid of employees, and told managers their job was production not personnel.	For a German firm it is very hard to remove poor performers. The management has to prove at least three times that an individual underperformed before they can take serious action.	At a US firm, the manager fired four people during last couple of months due to underperformance. They continually investigate why and who are underperforming.

(16) Promoting high performers

a) Can you rise up the company rapidly if you are really good? Are there any examples you can think of?
b) What about poor performers – do they get promoted more slowly? Are there any examples you can think of?
c) How would you identify and develop (i.e. train) your star performers?
d) If two people both joined the company 5 years ago and one was much better than the other would he/she be promoted faster?

	Score 1	Score 3	Score 5
Scoring grid:	People are promoted primarily upon the basis of tenure	People are promoted upon 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 program. 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.

(17) Attracting human capital

a) What makes it distinctive to work at your company as opposed to your competitors?
b) If you were trying to sell your firm to me how would you do this (get them to try to do this)?
c) What don't people like about working in your firm?

	Score 1	Score 3	Score 5
Scoring grid:	Our competitors offer stronger reasons for talented people to join their companies	Our value proposition to those joining our company is comparable to those offered by others in the sector	We provide a unique value proposition to encourage talented people join our company above our competitors
Examples:	A manager of a firm in Germany could not give an example of a distinctive employee proposition and (when pushed) thinks the offer is worse than most of its competitors. He thought that people working at the firm "have drawn the short straw".	A US firm seeks to create a value proposition comparable to its competitors and other local companies by offering competitive pay, a family atmosphere, and a positive presence in the community.	A German firm offers a unique value proposition through development and training programs, family culture in the company and very flexible working hours. It also strives to reduce bureaucracy and seeks to push decision making down to the lowest levels possible to make workers feel empowered and valued.

(18) Retaining human capital

a) If you had a star performer who wanted to leave what would the company do?
b) Could you give me an example of a star performers being persuaded to stay after wanting to leave?
c) Could you give me an example of a star performer who left the company without anyone trying to keep them?

	Score 1	Score 3	Score 5
Scoring grid:	We do little to try and keep our top talent.	We usually work hard to keep our top talent.	We do whatever it takes to retain our top talent.
Examples:	A German firm lets people leave the company if they want. They do nothing to keep those people since they think that it would make no sense to try to keep them. Management does not think they can keep people if they want to work somewhere else. The company also will not start salary negotiations to retain top talent.	If management of a French firm feels that people want to leave the company, they talk to them about the reasons and what the company could change to keep them. This could be more responsibilities or a better outlook for the future. Managers are supposed to "take-the-pulse" of employees to check satisfaction levels.	A US firm knows who its top performers are and if any of them signal an interest to leave it pulls in senior managers and even corporate HQ to talk to them and try and persuade them to stay. Occasionally they will increase salary rates if necessary and if they feel the individual is being underpaid relative to the market. Managers have a responsibility to try to keep all desirable staff.

TABLE A1: QUESTION LEVEL AVERAGES BY COUNTRY

Countries	Question number	Question type	Average Value by Country (US = 100) (1) UK	(2) Germany	(3) France	Regression Coefficients (4) All
Modern manufacturing, introduction	1	Operations	90.0 (3.50)	86.4 (3.47)	101.3 (3.63)	0.017** (0.008)
Modern manufacturing, rationale	2	Operations	92.9 (3.35)	101.5 (3.32)	101 (3.47)	0.012 (0.009)
Process documentation	3	Operations	89.0 (3.51)	106.9 (3.49)	99 (3.64)	0.030*** (0.009)
Performance tracking	4	Monitoring	98.3 (3.19)	109.5 (3.17)	111 (3.32)	0.018** (0.009)
Performance review	5	Monitoring	94.7 (2.99)	110.2 (2.97)	104 (3.10)	0.016* (0.009)
Performance dialogue	6	Monitoring	93.0 (3.19)	103.3 (3.11)	99 (3.27)	0.019** (0.009)
Consequence management	7	Monitoring	96.5 (3.02)	108.7 (3.01)	94 (3.13)	0.019** (0.009)
Target breadth	8	Targets	91.1 (3.53)	93.3 (3.51)	94 (3.66)	0.027*** (0.009)
Target interconnection	9	Targets	93.7 (3.56)	97.3 (3.54)	78 (3.68)	0.023*** (0.009)
Target time horizon	10	Targets	91.9 (3.69)	98.6 (3.66)	92 (3.83)	0.021** (0.009)
Targets are stretching	11	Targets	87.8 (3.34)	104.9 (3.32)	101 (3.45)	0.015* (0.009)
Performance clarity and comparability	12	Monitoring	93.7 (3.53)	80.7 (3.49)	83 (3.65)	0.008 (0.009)
Managing human capital	13	Targets	89.4 (3.94)	99.0 (3.92)	89 (4.08)	0.023** (0.009)
Rewarding high performance	14	Incentives	81.6 (3.42)	85.2 (3.42)	85 (3.55)	0.022** (0.010)
Removing poor performers	15	Incentives	89.4 (3.04)	92.5 (3.02)	83 (3.15)	0.011 (0.009)
Promoting high performers	16	Incentives	90.2 (2.86)	104.9 (2.85)	92 (2.97)	0.017* (0.010)
Attracting human capital	17	Incentives	90.4 (2.89)	95.1 (2.88)	85 (2.99)	0.029*** (0.009)
Retaining human capital	18	Incentives	93.6 (2.74)	97.7 (2.73)	97 (2.84)	0.007 (0.009)
Unweighted Average			91.5	98.7	93.8	0.019 (0.009)

NOTES: In columns (1) to (3) standard deviation of each question's average response are reported below in brackets. Calculated from full sample of 732 firms. Management z-scores used in these calculations. In column (4) results from 18 OLS estimations following exactly the same specification as column (1) Table (2) except estimated with each individual question z-score one-by-one rather than the average management z-score. So every cell in column (4) is from a different regression with 5350 observations from 709 firms where: standard errors in parentheses allow for arbitrary heteroskedacity and correlation (clustered by firm), and regression includes "full controls" comprising of "firm" controls and "noise controls" as detailed in Table 2. *** denotes 1% significance, ** denoted 5% significance and * denotes 1% significance.

APPENDIX A2: HUMAN RESOURCES INTERVIEW GUIDE

Run in parallel as the management survey but targeted at the HR department

Workforce Characteristics

Data Field	Breakdown
Total number of employees (cross check again accounts)	(all employees)
% with university degree	(all employees)
% with MBA	(all employees)
Average age of employees	(all employees)
% of employees	(managerial/non-managerial)
Average training days per year	(managerial/non-managerial)
Average hours worked per week (including overtime, excluding breaks)	(managerial/non-managerial)
Average holidays per year	(all employees)
Average days sick-leave	(all employees)
% part-time	(managerial/non-managerial)
% female	(managerial/non-managerial)
% employees abroad	(all employees)
% union membership	(all employees)
Are unions recognized for wages bargaining [yes / no]	(all employees)

Work-life balance: Perceptions

Question	Response choice (all employees)
Relative to other companies in your industry how much does your company emphasize work-life balance?	[much less / slightly less / the same / slightly more / much more]

Work-Life balance: Policies

Question	Response choice (managerial/non-managerial)
If an employee needed to take a day off at short notice due child-care problems or their child was sick how do they generally do this?	[Not allowed / Never Been Asked / Take as leave without pay / Take time off but make it up later / Take as annual leave / Take as sick leave]

What entitlements are there to the following	Breakdown
Working at home in normal working hours?	(managerial/non-managerial)
Switching from full-time to part-time work?	(managerial/non-managerial)
Job sharing schemes?	(managerial/non-managerial)
Financial subsidy to help pay for childcare?	(managerial/non-managerial)

Organizational Characteristics

Question	Response choice (all employees)
Who decides the pace of work?	[exclusively workers / mostly workers / equally / mostly managers / exclusively managers]
Who decides how tasks should be allocated?	[exclusively workers / mostly workers/ equally / mostly managers / exclusively managers]
Do you use self-managing teams?	[v. heavily / heavily / moderately / slightly / none]

Market & firm questions:	Response choice
# of competitors	[none / less than 5 / 5 or more]
# hostile take-over bids in last three years	[none / one / more than one]

Interviewer's assessment of the scoring reliability

1 to 5 scoring system calibrated according to:

1 = Interviewee did not have enough expertise for interview to be valuable; I have significant doubts about most of the management dimensions probed

3 = Interviewee had reasonable expertise; on some dimensions I am unsure of scoring

5 = Interviewee had good expertise, I am confident that the score reflects management practices in this firm

APPENDIX B: DATA

Sampling Frame Construction
Our sampling frame was based on the Amadeus dataset for Europe (UK, France and Germany) and the Compustat dataset for the USA. These all have information on company accounting data. We chose firms whose principal industry was in manufacturing and who employed (on average between 2000 and 2003) no less than 50 employees and no more than 10,000 employees. We also removed any clients of the consultancy firm we worked with from the sampling frame (33 out of 1,353 firms).

Our sampling frame is reasonably representative of medium sized manufacturing firms. The European firms in Amadeus include both private and public firms whereas Compustat only includes publicly listed firms. There is no US database with privately listed firms with information on sales, labour and capital. Fortunately, there are a much larger proportion of firms are listed on the stock exchange in the US than in Europe so we are able to go substantially down the size distribution using Compustat. Nevertheless, the US firms in our sample are slightly larger than those of the other countries, so we are always careful to control for size and public listing in the analyses. Furthermore, when estimating production functions we can allow all coefficients to be different on labour, capital, materials and consolidation status by country.

Another concern is that we condition on firms where we have information on sales, employment and capital. These items are not compulsory for firms below certain size thresholds so disclosure is voluntary to some extent for the smaller firms. Luckily, the firms in our sampling frame (over 50 workers) are past the threshold for voluntary disclosure (the only exception is for capital in Germany).

We achieved a response rate of 54% from the firms that we contacted: a very high success rate given the voluntary nature of participation. Respondents were not significantly more productive than non-responders. French firms were slightly less likely to respond than firms in the other three countries and all respondents were significantly larger than non-respondents. Apart from these two factors, respondents seemed randomly spread around our sampling frame

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 Amadeus (France, Germany and the UK) and Compustat (US). For other data fields we did the following:

<u>Materials</u>: In France and Germany these are line items in the accounts. In the UK these were constructed by deducting the total wage bill from the cost of goods sold. In the US these were constructed following the method in Bresnahan et al. (2002). We start with costs of good sold (COGS) less depreciation (DP) less labour costs (XLR). For firms who do not report labour expenses expenditures we use average wages and benefits at the four-digit industry level (Bartelsman, Becker and Gray, 2000, until 1996 and then Census Average Production Worker Annual Payroll by 4-digit NAICS code) and multiply this by the firm's reported employment

level. This constructed measure is highly correlated at the industry level with materials. Obviously there may be problems with this measure of materials (and therefore value added) which is why we check robustness to measures without materials. For the US this was obtained from Dunn and Bradstreet.

Industry level data

This comes from the OECD STAN database of industrial production. This is provided at the country ISIC Rev. 3 level and is mapped into US SIC (1997) three (which is our common industry definition in all four countries).

TABLE B1 DESCRIPTIVE STATISTICS

	All	France	Germany	UK	US
Number of firms, #	732	135	156	151	290
Work-life balance	3.21	3.44	3.03	3.19	3.22
Management (mean z score)	-0.001	-0.084	0.032	-0.150	0.097
Employment (mean)	1,984	1,213	1,816	1,735	2,569
Labour share of output,%	26.4	23.5	28.2	27.2	28.0
Tobin's Q	1.71	1.16	1.86	2.01	0.88
Nominal sales growth rate, %	6.0	5.4	3.8	6.8	7.2
Age of firm (years)	53.4	38.6	86.8	44.7	48.4
Listed firm,%	57.2	16.1	41.0	28.5	100
Multinational subsidiary, %	5.1	8.9	7.1	9.3	0
Share workforce with degrees, %	21.2	15.5	14.3	14.0	31.0
Share workforce with an MBA, %	1.36	0.23	0.09	1.28	2.73
Sickness, days/year	6.80	8.16	8.51	6.21	5.01
Hours, hours per week	40.7	35.6	38.6	40.8	44.1
Holidays, days per year	22.7	32.2	29.7	26.9	12.4
Union density, %	19.9	9.7	41.4	25.3	9.4
Number of competitors index, 1="none", 2="a few", 3="many"	2.47	2.32	2.35	2.53	2.56
Lerner index , excluding the firm itself	0.055	0.040	0.071	0.040	0.060
Trade Openness (imports/output)	0.31	0.33	0.32	0.42	0.24
Childcare flexibility (see Appendix A2, 1 is none and 3 is maximum)	2.82	2.75	2.85	2.82	2.85
Working from home (% that allow this)	31.6	23.4	31.7	44.1	30.1
Switching from full-time to part-time (% that allow this)	48.0	76.5	61.5	43.7	27.8
Job-sharing (% that allow this)	10.0	21.0	7.7	15.5	3.6
Childcare subsidy (% that provide this)	16.6	58.5	5.3	3.4	8.4

Notes: Data descriptive calculated on the full sample of 732 firms for which management information is available.

TABLE C1: CONTROLS FOR MEASUREMENT ERROR

Dependent variable is Management z-score				
Explanatory Variable	**Definition**	**Mean**	**Coefficient (s.e.)**	**Coefficient (s.e.)**
Male	Respondent is male	0.982	-0.277 (0.128)	-0.298 (0.127)
Seniority	The position of manager in the organization (1 to 5)	3.08	0.074 (0.026)	0.073 (0.026)
Tenure in this post	Years with current job title	4.88	-0.011 (0.007)	-0.009 (0.006)
Tenure in the company	Years with the company	11.7	0.002 (0.004)	
Countries	Total number of countries worked in over last ten years	1.19	0.085 (0.048)	0.092 (0.043)
Organizations	Total number of organizations worked in over last ten years	1.66	-0.009 (0.032)	
Manager is foreign	Manager was born outside the country s/he works	0.032	-0.048 (0.142)	
Ever worked in USA	The manager has worked in the USA at some point	0.425	0.103 (0.152)	
Location of manager	Manager based on site (rather than in corporate HQ)	0.778	0.011 (0.063)	
Tuesday	Day of the week that interview was conducted, (Monday base)	0.181	0.011 (0.062)	0.016 (0.086)
Wednesday	Day of the week that interview was conducted, (Monday base)	0.280	0.017 (0.084)	0.014 (0.080)
Thursday	Day of the week that interview was conducted, (Monday base)	0.195	0.183 (0.088)	0.176 (0.088)
Friday	Day of the week that interview was conducted, (Monday base)	0.165	0.059 (0.090)	0.054 (0.090)
Local time for manager	The time of the day (24 hour clock) interview conducted	12.45	-0.023 (0.010)	-0.022 (0.010)
Days from start of project	Count of days since start of the project	39	0.001 (0.001)	
Duration of interview	The length of the interview with manager (in minutes)	46.0	0.008 (0.003)	0.007 (0.003)
Number of contacts	Number of telephone calls to arrange the interview	5.73	0.007 (0.006)	
Reliability score	Interviewer's subjective ranking of interview reliability (1 to 5)	4.15	0.326 (0.034)	0.327 (0.033)
17 Interviewer Dummies			F(15,699)=3.05 p-value=0.000	F(15,699)=3.46 p-value=0.000

NOTES: Coefficients from OLS regressions with standard errors in parentheses (robust to arbitrary heteroskedasticity); single cross section; 3 country dummies and 108 three digit industry dummies included in the regression; 732 observations

CENTRE *for* ECONOMIC PERFORMANCE

The London School of Economics and Political Science
Houghton Street London WC2A 2AE

Tel: +44 (0)20 7955 7673 Fax: +44 (0)20 7955 7595
Email: cep_info@lse.ac.uk