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THE LAND THAT LEAN MANUFACTURING FORGOT? MANAGEMENT PRACTICES
IN TRANSITION COUNTRIES

Nicholas Bloom
Helena Schweiger
John Van Reenen

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The Land that Lean Manufacturing Forgot? Management Practices in Transition Countries
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ABSTRACT

We have conducted the first survey on management practices in transition countries. We found that Central Asian transition countries, such as Uzbekistan and Kazakhstan, have on average very poor management practices. Their average scores are below emerging countries such as Brazil, China and India. In contrast, the central European transition countries such as Poland and Lithuania operate with management practices that are only moderately worse than those of western European countries such as Germany. Since we find these practices are strongly linked to firm performance, this suggests poor management practices may be impeding the development of Central Asian transition countries. We find that competition, multinational ownership, private ownership and human capital are all strongly correlated with better management. This implies that the continued opening of markets to domestic and foreign competition, privatisation of state-owned firms and increased levels of workforce education should promote better management, and ultimately faster economic growth.

Nicholas Bloom
Stanford University
Department of Economics
579 Serra Mall
Stanford, CA 94305-6072
and NBER
nbloom@stanford.edu

Helena Schweiger
EBRD, Office of the Chief Economist
One Exchange Square
London EC2A 2JN United Kingdom
helena.schweiger@gmail.com

John Van Reenen
Department of Economics
London School of Economics
Centre for Economic Performance
Houghton Street
London WC2A 2AE
UNITED KINGDOM
and NBER
j.vanreenen@lse.ac.uk

1 Introduction

Firms in transition countries were generally not exposed to market forces until the beginning of the 1990s and in some transition countries the state still accounts for over 50 per cent of GDP (for example, Belarus, Turkmenistan and Uzbekistan). Therefore the obvious question arises: what do management practices in these countries look like? Have they been modernised by the Lean manufacturing wave hitting Europe, the United States and Asia, or are these firms still operating using communist-era low quality mass production? And moreover do Western definitions of “good management” even apply in the ex-communist countries? For example, if corruption is widespread maybe it is best not to monitor the production process to minimise the availability of information on which officials can extract bribes.

Anecdotal evidence suggests that while there are many well-managed firms in transition countries, many firms are also operating with extremely old-fashioned management practices. For example, when we visited some of these countries we came across some well managed firms (for example Exhibit 1), but also firms without any formal maintenance programme, inventory or quality control system, or factory organisation (for example, Exhibits 2 to 3). More generally, it appeared that decades of central planning had left many managers in small and medium-sized firms with no vision of how to develop their company, how much investment they need, and weak financial management.

Several studies on firm productivity in transition countries allude to the lack of appropriate managerial skills as a possible explanation for lower productivity found among state-owned or formerly state-owned firms (see, for example, Estrin et al. (2009), Steffen and Stephan (2008), Brown et al. (2006), Zelenyuk and Zheka (2006), Yudaeva et al. (2003)). But until now actual data on management practices were not available for transition countries.

So in 2008 and 2009, the EBRD in cooperation with the World Bank conducted a new survey – the EBRD-WB Management, Organisation and Innovation (MOI) survey - the first management survey in transition countries. The survey adopted the approach of Bloom and Van Reenen (2007), focusing on core manufacturing management practices around

operations, monitoring, targets and incentives. The survey ran 1,874 face-to-face interviews with factory managers in 10 transition countries (Belarus, Bulgaria, Kazakhstan, Lithuania, Poland, Romania, Russia, Serbia (excluding Kosovo), Ukraine and Uzbekistan) as well as Germany as an advanced country benchmark and India as a developing country benchmark. We also matched our data to independently collected accounting data, and compared management scores to other surveys on other countries as in Bloom and Van Reenen (2010). We found several striking results. First, we found widespread variation in management practices both within and across countries. In particular, firms in Central Asian transition countries, like Uzbekistan and Kazakhstan, often operated with extremely poor management practices. Their firms were worse on average than those in developing countries like Brazil, China and India. In contrast, the central European transition countries like Poland and Lithuania operate with practices which are only moderately worse than those of European countries like the United Kingdom, France and Germany.

Matching our management data up to company accounts data enables us to evaluate to what extent management is linked to firms' productivity and profitability. Similar to Bloom and Van Reenen (2010) for non-transition countries, we find that good management is also strongly linked to better firm performance in transition countries. This suggests that poor management practices may be impeding the development of Central Asian transition countries.

Finally, we investigate the factors that may account for poor management in many transition countries. We find that factors that matter in non-transition countries matter in transition countries as well. Stronger product market competition, higher levels of multinational ownership, and greater employee education are all strongly correlated with better management. We are also able to show that higher levels of private ownership are strongly correlated with better management, something that was not previously documented in work on management practices. This suggests that the continued opening of markets to domestic and foreign competition, privatisation of state-owned firms, and increased levels of workforce education should promote better management, and ultimately higher national productivity. Section 2 explains how we measure management practices, section 3 describes the pattern of management practices we see across transition countries, while section 4 related management

practices to performance, and section 5 investigates the factors accounting for differences in management practices across firms and countries. Finally, section 6 concludes.

2 Measuring management practices

2.1 Scoring management practices

The concept of “good” or “bad” management needs to be translated into a measure applicable to different firms across the manufacturing sector in various countries. In contrast to previous questionnaires on management practices, the MOI survey consisted mostly of closed-ended questions, in which the options offered to interviewees were based on the responses from Bloom and Van Reenen (2010). Bloom and Van Reenen in turn used a practice evaluation tool developed by a leading international management consultancy firm. One could argue that what constitutes “good” management practices in the sense of getting things done in eastern Europe and central Asia differs from what constitutes “good” management practices in other parts of the world, in particular western Europe, due to a different business environment. So we focused on practices that we believe are clearly “good”, such as monitoring production to identify and fix repeated problems, making promotion decisions based on employees' performance (rather than, for example, family connections), and retraining or moving incompetent employees (rather than leaving them in post). As we show, these management practices are unsurprisingly strongly correlated with superior firm performance.

Management practices were grouped into four areas: *operations* (one question), *monitoring* (seven questions), *targets* (one question) and *incentives* (three questions). The operations question focused on how the establishment handled a process problem, such as machinery breakdown. The monitoring questions covered collection, monitoring, revision and use of production performance indicators. The targets question focused on the time-scale of production targets and the incentives questions covered promotion criteria, practices for addressing poor employee performance, and rewarding production target achievement. We list the questions we used for each management practice and the scoring we assigned to answers in Appendix A.

As the scaling varied across management practices, the scores were converted to z-scores by normalising each practice (that is question) to mean zero and standard deviation one:

$$z_{m_i} = \frac{m_i - \bar{m}_i}{\sigma_{m_i}} \quad (1)$$

where z_{m_i} is the z-score of management practice m_i in firm i , \bar{m}_i is the unweighted average of management practice m_i across all observations in all countries and σ_{m_i} is the standard deviation of management practice m_i across all observations in all countries. To avoid putting the most emphasis on the monitoring aspect of management practices (which had the most underlying questions), an unweighted average was first calculated across z-scores for a particular area of the four management practices:

$$\bar{m}_{i,A} = \frac{1}{n_{m_{i,A}}} \sum_{m \in A} z_{m_i} \quad (2)$$

where $\bar{m}_{i,A}$ is the unweighted average of management practices belonging to an area of management A (operations, monitoring, targets or incentives) in firm i , and $n_{m_{i,A}}$ denotes the number of observations for which the measures are available. Lastly, an unweighted average was then taken across the scores for the four practices, and finally a z-score of the measures obtained was calculated:¹

$$\begin{aligned} \tilde{M}_i &= \frac{1}{4} (\bar{m}_{i,operations} + \bar{m}_{i,monitoring} + \bar{m}_{i,targets} + \bar{m}_{i,incentives}) \\ z_{\tilde{M}_i} = M_i &= \frac{\tilde{M}_i - \bar{\tilde{M}}_i}{\sigma_{\tilde{M}_i}} \end{aligned} \quad (3)$$

This means that the average management practices across all firms in all countries in the sample are equal to zero, and the actual management practices of the firm deviate from zero either to the left (“bad” practices) or to the right (“good” practices).

Firm-level performance data – balance sheets and income and loss statements – were obtained from Bureau Van Dijk’s Orbis database for the countries covered and matched to the sample of completed interviews. These data come from a source independent of the survey and allow

¹ This is an accepted way of calculating index numbers – see Bresnahan et al. (2002).

us to examine the external validity of our measures of management practices by examining whether the data we collect are correlated with external measures of firm performance.

2.2 Collecting accurate responses

MOI interviews were conducted face-to-face and the interviewers were recruited by the local survey companies. This makes the MOI survey different from the Bloom and Van Reenen (2007, 2010) management practices surveys, which were conducted by phone from London with MBA students as interviewers. We took several steps to increase the accuracy of answers.

First, the interviewers were trained to not lead the managers to a particular answer. As part of this process the options offered to the managers to choose their answer from did not always follow the same pattern from, say, worst practices to best management practices.²

Second, the interviewers did not have access to the firm's financial information or performance in advance of the interview. They only received firm names and contact details. While they – as locals – may have by chance been familiar with the performance of a couple of larger firms they interviewed, they would not know that for all of them, and they had no interest in spending time researching the firms' performance prior to the interview. We selected medium-sized manufacturing firms (the median size was 130 employees – see Table 2), which would in general not be known by name.

Third, we collected a detailed set of information on the interview process (local time of day, date, duration of the interview), on the manager (gender, seniority, nationality, company and job tenure, location), and on the interviewer (gender, age and highest education level achieved). By including this information in the analysis, we explicitly controlled for at least part of interview bias.

The questionnaire comprised seven sections organised by topic. The first asked questions about the characteristics of the firm, such as legal status, ownership and number of years in operation. This was followed by sections on management practices, organisation of the firm,

² The actual questions used and the scoring we assigned to answers can be found in Appendix A.

innovation and R&D, degree of competition and labour. The MOI questionnaire was developed and tested in two pilot surveys prior to its implementation in the field.³

2.3 Correlation of management scores across different surveys

The EBRD survey deliberately re-interviewed 404 firms that were interviewed in 2006 for the Bloom and Van Reenen (2010) survey (henceforth the BvR survey) in Germany, India and Poland. We did this to enable us to directly compare across the two different surveys of management practices. We found a correlation of 0.298 between the two surveys, which was significant at the 1% level. This correlation is high given that: (i) two to three years have passed between the two sets of interviews, (ii) the surveys asked a different set of questions and were scored using a different approach (open-ended questions for BvR and multiple choice for the EBRD survey), (iii) the surveys typically asked different people (most firms have several factory, production or operations managers), (iv) the interviewers were different (MBA students working in London for BvR and local survey agents for the EBRD interview), and (v) the survey approach was different (phone survey versus face-to-face survey). As a benchmark, in Bloom and Van Reenen's work the correlation between the 2006 and 2010 rounds of their survey is 0.427 when different managers were interviewed. This indicates the correlation of about 0.298 between the MOI and BvR scores is high given the inherent noise in measuring management.

2.4 Obtaining interviews with managers

From October 2008 to April 2010⁴ the EBRD conducted the first MOI survey in collaboration with the World Bank. The survey was primarily targeted at factory, production or operations managers, who are close to the day-to-day operations of the firm but are at the same time senior enough to have an overview of management practices.⁵ In reality, the respondents often included more senior managers (CEOs, Vice Presidents, General Directors) because they said they are ultimately responsible for production and wanted to be the ones providing the

³ The first pilot survey took place simultaneously in Ukraine and the United States, and the second pilot survey took place in the United Kingdom.

⁴ Fieldwork in Belarus, Bulgaria, Kazakhstan, Lithuania, Poland, Romania, Russia (excluding Far East), Serbia, Ukraine, Uzbekistan and Germany took place between October 2008 and March 2009. Fieldwork in India took place between August 2009 and October 2009 and in the Russian Far East between February 2010 and April 2010. For more details, please refer to the Technical Report available on the EBRD's website.

⁵ Factory managers are usually responsible for the efficient operation, maintenance and budgetary control of production. Production/operations managers ensure that goods are produced efficiently, at the right quality, quantity and cost, and that they are produced on time.

answers. Interviews were conducted face-to-face in the manager's native language by interviewers employed by the market research companies hired to implement the MOI survey. Each interview took on average 54 minutes.

The average response rate to the survey was over 40 per cent and this appeared to be uncorrelated with productivity or profitability. There was some evidence that larger firms were more likely to respond, which is why the regressions typically control for this variable to offset any potential sample selection bias. In the initial contact with the firm, the interview was introduced as part of a study that would not discuss the firm's financial position or its accounts, making it relatively non-controversial for managers to participate. As in Bloom and Van Reenen (2007, 2010), management practices were ordered to lead with the least controversial (operations management) and finish with the most controversial (promotions and firings). In several countries, we have also provided a letter from the EBRD and the World Bank confirming that the local survey company was doing the survey on their behalf.

2.5 Characteristics of chosen countries

The survey covered 1,874 manufacturing firms with between 50 and 5,000 employees in 10 transition countries, Germany and India. The transition countries were chosen to cover a range of progress in transition. Germany was chosen as a developed country benchmark – only the United States superseded it in terms of average management practices in Bloom and Van Reenen (2010). India was chosen as a developing country benchmark, and is in some respects similar to the transition countries. India became independent in 1947. From the 1950s, a "License Raj" was in operation: a rigid and stern licensing regime which restricted entry into the manufacturing industry and put several microeconomic restrictions on licensed firms (see Sharma (2008)). Some of these were similar in spirit to the command economy in transition countries. There was initial deregulation in the 1980s and trade reforms in the 1990s and this has transformed India into one of the fastest growing economies.

Table 1 shows selected indicators for these countries. Germany had the highest GDP per capita in 2008 among the selected countries and Uzbekistan the lowest (in constant 2005 international US\$ PPP terms). Private sector share of GDP ranged between 30 per cent in Belarus and 75 per cent in Bulgaria, Lithuania and Poland. EBRD transition index in the area

of governance and enterprise restructuring, which measures the absence of soft budget constraints and effective corporate governance, was lowest in Belarus and Uzbekistan (2-) and highest in Poland (4-). Value added in manufacturing as a percentage of GDP varied between 12 per cent in Uzbekistan and 33 per cent in Belarus.

Table 1. Some characteristics of countries covered by the MOI survey

Country	Population 2008, million	Private sector share of GDP in 2009 (EBRD estimate), %	EBRD index of governance and enterprise restructuring	GDP per capita in 2008, \$ PPP	Manufacturing value added 2008, % GDP
Belarus	10	30	2-	11,353	33
Bulgaria	8	75	3-	11,259	15
Germany	82	na	na	33,718	24*
India	1,140	na	na	2,796	16
Kazakhstan	16	65	2	10,469	13
Lithuania	3	75	3	17,571	18
Poland	38	75	4-	16,436	17
Romania	22	70	3-	11,782	21
Russia	142	65	2+	14,706	18
Serbia	7	60	2+	10,229	na
Ukraine	46	65	2+	6,721	23
Uzbekistan	27	45	2-	2,455	12

Sources: EBRD *Transition Report 2009* and World Bank World Development Indicators.

Note: * denotes that the data refer to 2007. Population data for Serbia do not include Kosovo.

2.6 Sampling frame and additional data

The sampling frame, from which these firms were picked in main cities randomly with equal probability, was based on Bureau Van Dijk's Orbis database (as available in August 2008) with the exception of India, Kazakhstan and Uzbekistan. The sampling frame in Kazakhstan was the official list of establishments obtained from the Agency of Statistics of the Republic of Kazakhstan,⁶ and in Uzbekistan the Uniform State Register of Enterprises and Organisations published by the State Department of Statistics of the Republic of Uzbekistan. In the Russian Far East, Orbis database was augmented with BCD (business card database).⁷ In Poland and Germany, as well as in India, several establishments that participated in a

⁶ At the time of fieldwork preparation, Bureau van Dijk's Orbis had very little data on manufacturing firms in Kazakhstan. They have since improved the coverage, but no financial information is available so far.

⁷ BCD includes systematised statistical and other information on manufacture and infrastructure of area, region, and the country as a whole.

previous survey on management practices were re-interviewed as well. All regions within a country had to be covered⁸ and the percentage of the sample in each region was required to be equal to at least one half of the percentage of the sample frame population in each region.⁹

Comparison of the responding firms with those in the sampling frame revealed that responding firms tended to be slightly larger, but no evidence could be found of the responding firms being systematically different from the non-responding firms on any of the performance measures.

2.7 Summary statistics

Table 2 shows the summary statistics for the firms that participated in the MOI survey. With the exception of Belarus,¹⁰ the median number of employees in firms in all countries was less than 250, which means that most firms participating in the MOI survey were medium-sized firms. Share of foreign-owned multinational enterprises (MNEs) in the sample ranges from 0 in Ukraine to 15.8 per cent in Romania, while the share of privatised firms ranges from 0 in India to 47.8 per cent in Serbia. Belarus had the highest share of firms that are still state-owned, 78.4 per cent, while none of the firms interviewed in Romania was still state-owned.

⁸ Far East in Russia was covered in a subsequent wave of the MOI survey, which took place from February to April 2010.

⁹ More details on the sampling are available in the Sampling Note for the MOI survey, available on the EBRD website.

¹⁰ Orbis tends to cover larger firms in Belarus (25th quartile of the number of employees in manufacturing firms in 2008 is 211, median 350 and 75th quartile 721 employees), and since our sample frame was based on Orbis, firms in Belarus were on average larger.

Table 2. Summary statistics

Country	Number of firms in the sample	Number of panel firms (also in BvR survey)	Median employees based on survey	Median employees based on Orbis	Median operating revenue, thousand \$	Median return on total assets, %	Median profit margin, %	Median EBITDA margin, %	Share of foreign-owned MNEs, %	Share of privatised companies, %	Share of state-owned firms, %
Belarus	102		402	473	20,069		5.72		1.0	10.78	78.43
Bulgaria	154		99	96	2,584	3.66	3.57	12.10	4.6	27.92	1.30
Germany	222	101	170	190	66,567	6.00	2.93	6.65	15.8	4.50	0.45
India	200	200	130	847	29,651	3.39	3.10	9.53	4.0	0.00	3.00
Kazakhstan	125		140						2.4	41.60	7.20
Lithuania	100		112	100	8,109	2.76	2.39	9.82	13.0	32.00	3.00
Poland	103	103	248	200	17,534	4.15	3.00	6.46	13.7	29.13	10.68
Romania	152		101	88	2,492	2.60	2.08	8.32	2.6	23.68	0.00
Russia	311		124	151	6,538	5.72	3.09		0.97	31.83	11.58
Serbia	135		100	104	3,638	-1.45	-1.05	4.74	7.4	47.76	17.91
Ukraine	147		140	130	2,293	0.21	0.14	4.58	0.0	44.90	13.61
Uzbekistan	123		81						1.6	40.65	17.89
Total	1,874	404	130	144	6,185	3.14	2.35	7.14	5.36	26.32	11.43

Sources: MOI survey and Orbis.

Note: Summary statistics for the variables from Orbis (number of employees, operating revenue, return on total assets, profit margin and EBITDA margin) refer to 2008. Data on these variables may not be available for all companies in the sample, which is why there can be significant discrepancies between the median number of employees based on the survey and based on Orbis. EBITDA stands for earnings before interest, taxes, depreciation and amortisation. MNEs are multinational enterprises.

3 Patterns of management practices in transition countries

Patterns of management practices in developed and developing countries have been documented in Bloom and Van Reenen (2010). We find that their main findings hold for transition countries as well. Chart 1 shows the average country-level management practice scores from 1,874 interviews. Germany has the highest management practice scores on average (as we expected), followed by Lithuania and Poland, with Uzbekistan in last place.

Looking at Chart 1 we see that, first, Kazakhstan and Uzbekistan have on average worse management practices than India, a developing country whose GDP per capita was slightly higher than Uzbekistan's. Russia's management practices are at about the same level.¹¹ This is potentially because of India's more pro-multinational climate. India scored much better on getting credit and protecting investors as well as trading across borders in World Bank's Doing Business 2011, which indicates that it is a more open economy and more attractive for foreign investors, who tend to bring better management practices with them. On the Economic Freedom of the World 2007 Index India also has fewer restrictions on foreign ownership and investment than any other transition country in the sample (Gwartney et al. (2009)). These three countries are also rich in natural resources, while India is not. Russia and Kazakhstan are major oil and gas producers. Extraction accounted for 8 per cent of GDP in Russia and 18.7 per cent of GDP in Kazakhstan in 2008, but only about 2.5 to 3 per cent of GDP in India.

This cross-country ranking approximates the cross-country productivity rankings, though not perfectly. The correlation coefficient between PPP GDP per capita at constant 2005 international \$ in 2008 and average country-level management score is 0.69, significant at the 5 per cent significance level (p-value 0.013). However, a better measure may be manufacturing value added per employee in manufacturing, since our survey covers only manufacturing firms, but unfortunately data on manufacturing value added per employee are only available for a subsample of the countries included in our analysis.¹²

¹¹ It should be noted that differences in average management scores between Germany and Lithuania and between India and Kazakhstan are not statistically significant.

¹² Approximate data are available for Belarus, Bulgaria, Kazakhstan, Lithuania, Poland, Ukraine and Uzbekistan which have data on manufacturing value added and percentage of employment in industry. Manufacturing value

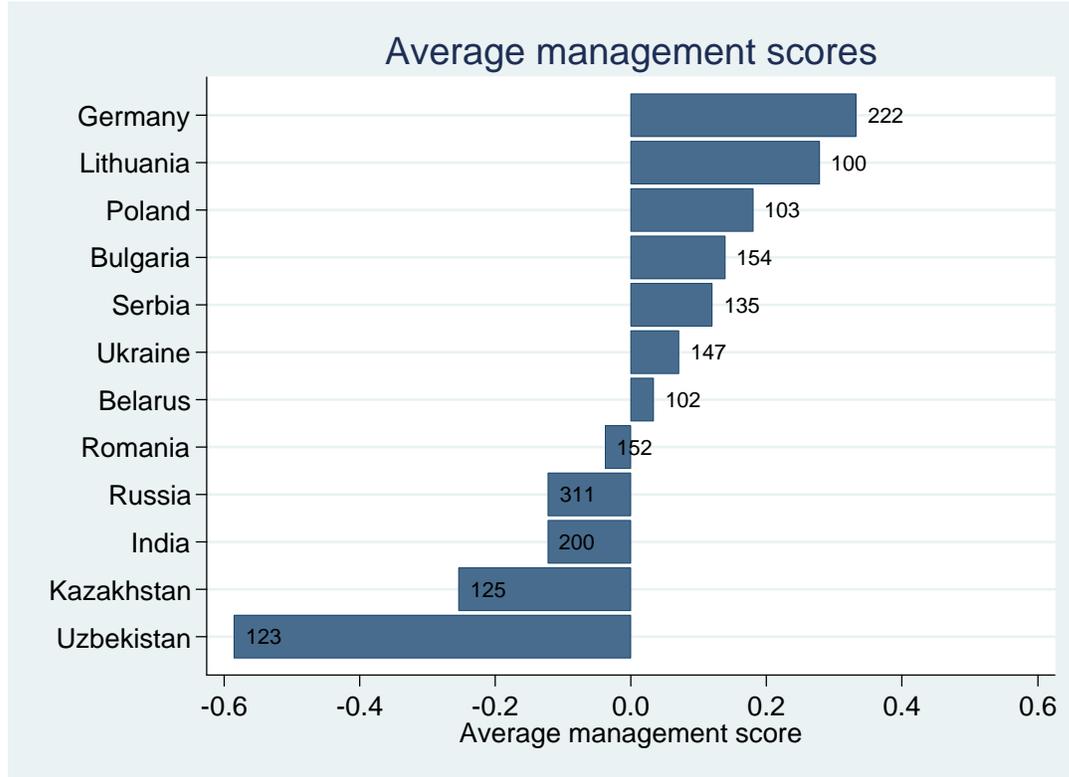
The overall management scores can be separated into four areas: operations, monitoring, targets and incentives. Chart 2 shows the country-level average scores for each of them. In line with the overall rankings, Germany is in the top four in three out of the four categories, while Uzbekistan is consistently in the bottom two. However, there are also some interesting differences across categories. While many firms interviewed in Belarus and Bulgaria, for example, excel at monitoring – that is, frequently collecting data on several production performance indicators, showing it to factory managers and workers, and regularly reviewing the production performance indicators – they are less adept at translating monitoring into operations. Firms in Ukraine tend to be good at targets management, but bad at operations management. It is interesting to note that firms in Kazakhstan, Russia and Uzbekistan do not tend to be good at targets management and to some extent monitoring management, opposite to what one might expect given the legacy of meeting planned production targets in these countries. The most eclectic ranking emerges on incentives management, although differences across countries are smaller in this category than in others and often not statistically significant.¹³

The data in Chart 2 also describe how management styles differ across countries. Relative to the average, the use of incentives is greater than the use of monitoring in Ukraine, Serbia and Romania. However, in Lithuania and Germany the use of monitoring and target management (relative to the average) exceeds their use of incentives (relative to the average). In Belarus, the managerial use of monitoring (relative to the average) is far greater than the operations management (relative to the average).

added per capita is available for more countries, but still missing for Romania, Russia and Serbia. The correlation coefficient between manufacturing value added per capita (where available) and average country-level management score is positive, but insignificant (0.66, p-value 0.1089), but the Spearman (rank) correlation coefficient is highly positive and significant (0.68, p-value 0.0938). However, the correlations with GDP per capita are also higher in this subsample (correlation: 0.81, p-value 0.0257; rank correlation: 0.82, p-value 0.0234).

¹³ Differences in average incentives management scores are not statistically significant between Serbia and Ukraine, between Germany, Kazakhstan, Lithuania, Poland and Uzbekistan, and between Belarus, Bulgaria, Germany, India, Kazakhstan, Poland, Romania and Russia.

Chart 1. Management scores across countries

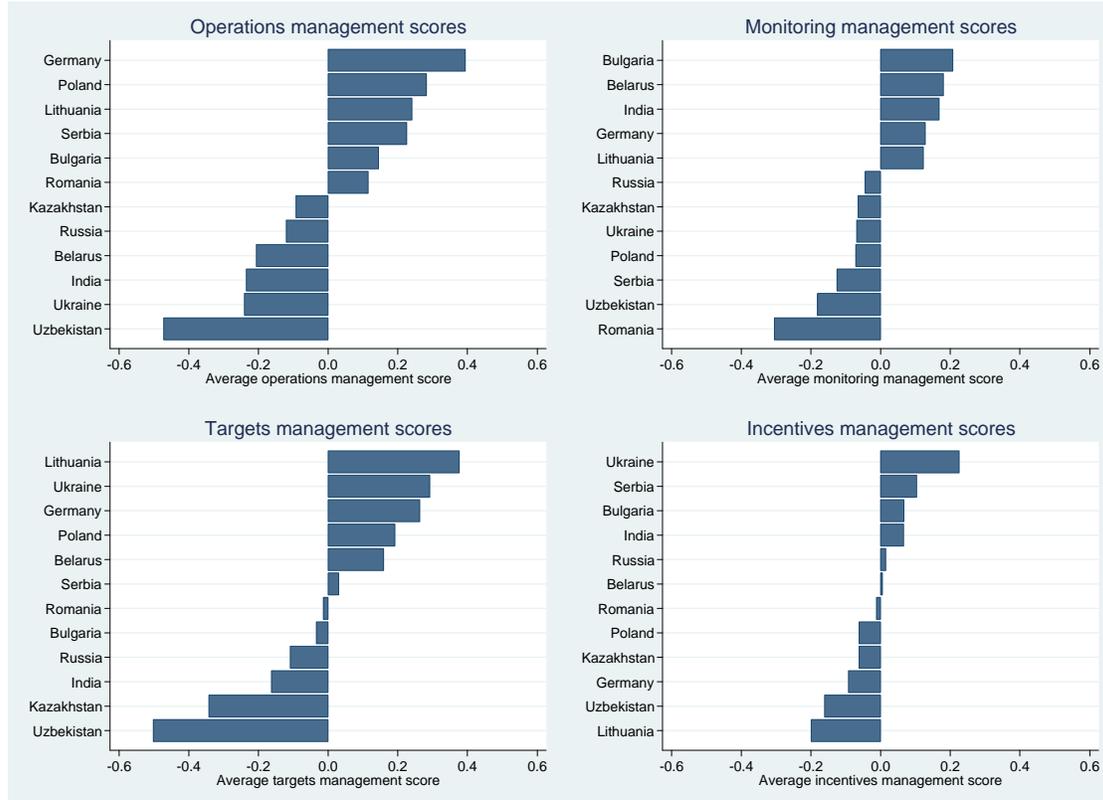


Source: MOI survey.

Note: Number of firms included is indicated in the chart. Scores are reported as z-scores, so are in deviations from the sample average of zero.

There could be many reasons for this pattern of specialisation across countries, one of them being the business environment. For example, countries with less stringent labour market regulations may use incentives more as it is easier to remove poor performers and to reward high performers. In the EBRD and World Bank Business Environment and Enterprise Performance Survey (which was in the field during a similar period as the MOI survey), inadequately educated workforce was one of the top two business environment obstacles in all transition countries included except Bulgaria (see EBRD 2010, Chapter 5). Labour regulations tended to be in the bottom half of the business environment obstacles, but in general a bigger obstacle in the EU-10 than the rest of the transition countries.

Chart 2. Management scores across countries by management categories



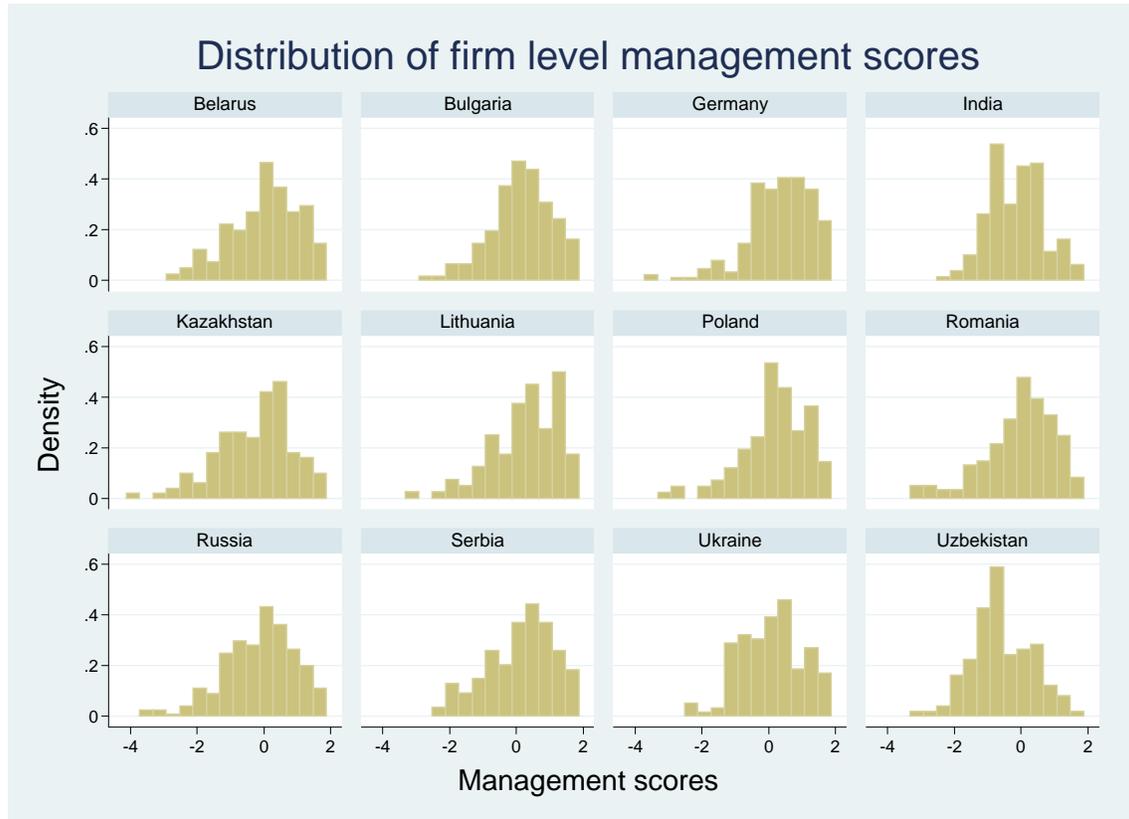
Source: MOI survey.

The fact that Germany is among the top four countries on three out of four management areas and Uzbekistan among the bottom two on all four management areas does not mean that there are no firms with bad management practices in Germany and no firms with good management practices in Uzbekistan. What it does indicate, though, is that the proportion of firms with good management practices in Uzbekistan is lower than the proportion of firms with good management practices in Germany. Chart 3 illustrates this by looking at the firm-level histogram of management practices by country. The bars show the actual data in each country.

Countries can improve average management practices in two ways: (i) by promoting factors that increase average management quality in each firm (through better business education, for example) and (ii) through improved reallocation across firms (for example, letting efficient firms grow larger). The first option aims at increasing productivity within the average firm,

while the second improves the allocative efficiency.¹⁴ We look at both factors in turn in the next section.

Chart 3. Management scores across firms



Source: MOI survey.

Note: Bars are the histograms of the actual density.

¹⁴ See Olley and Pakes (1996) for a decomposition of aggregate productivity into unweighted average productivity and the cross-sectional allocative efficiency.

4 Management quality and firm performance

4.1 Management and Firm Performance

To estimate how firm management practices relate to firm performance in the MOI survey sample, we estimated the following firm-level performance regressions:

$$y_{itc} = \alpha_l l_{itc} + \alpha_k k_{itc} + \alpha_n n_{itc} + \beta M_i + \gamma \mathbf{Z}_{itc} + u_{itc} \quad (1)$$

where y is a measure of firm performance, l the logarithm of labour, k the logarithm of capital, and n the logarithm of material inputs of firm i in country c at time t . The \mathbf{Z} s are all other controls that will affect productivity, such as workforce characteristics (employees with a completed university degree and the average weekly hours worked), firm characteristics (firm age and whether it is listed on the stock market), a set of three-digit industry dummies and country-year (or only country) dummies. M represents average management quality, calculated based on a scoring of each of 12 individual management practices, averaged over the variables included in each of the four core areas of management practices, and finally averaged over these four areas (as explained in section 2).

In terms of performance metrics we looked at operating revenue, profit margin (sum of operating profit and financial profit divided by total operating revenue), EBITDA margin¹⁵ and return on total assets (ROTA) for a subset of firms with available company accounts.

We estimate equation (1) by running OLS on the repeated cross-section (unbalanced panel) with standard errors clustered by company, and assume that all the correlated heterogeneity is captured by the control variables. The sample consists of all firms with available accounts data at some point between 2003 and 2008. The maximum number of years for which we have data is thus six years, and the average number of years used in the estimation is close to five years.

¹⁵ EBITDA stands for earnings before interest, taxes, depreciation and amortisation. It is equal to the sum of operating profit and depreciation.

4.2 Production Functions

Table 3 looks at the association between firm performance as measured by operating revenue and management practices. This means the relationships we uncover are not necessarily causal – we can only identify conditional correlations between our variables. In recent work Bloom et al. (2011a) have run management field experiments in India, identifying a causal impact of these types of management practices on firms' productivity and profitability.

Column (1) of Table 3 includes only industry and country by year dummies as additional controls. The management score is strongly positively and significantly associated with higher operating revenue (sales) and coefficient suggests that firms with one point higher average management score have about 19 log points (almost 21 per cent) higher sales. Column (2) includes employment as an additional control so the coefficient of management can be interpreted as the “marginal effect” on labour productivity. This reduces the coefficient on the management score, but it remains positive and significant. Column (3) includes controls such as average hours worked, firm age, listing status, education and a set of interview noise controls, which reduces the coefficient on management score further, but it remains significant. The other coefficients take intuitive signs. For example, as shown in the table, firms with more human capital (as proxied by the proportion of employees with a college degree) have higher productivity. In column (4), we add fixed capital so the coefficient on management can be interpreted as the effect on total factor productivity. This significantly reduces the coefficient on management score, suggesting that firms with one point higher average management score have about 8.5 log points (about 8.8 per cent) higher productivity. In the final two columns we control for materials. Since this variable is only available for a subset of the sample, we first confirm that the results are robust to estimating on this smaller sample in column (5). The management coefficient is actually somewhat larger. Finally, in column (6) we add materials, which results in a smaller coefficient on management score but it still remains positive and highly significant, suggesting that firms with one point higher average management score have about 6 per cent higher total factor productivity. Note that the coefficients on the factor inputs are approximately equal to the revenue share of the relevant factors of production, which is reassuring. Overall, Table 3 suggests that the average management score is positively and significantly correlated with total factor productivity.

4.3 Profitability and Management

In Table 4 we look at various measures of profitability. The first three columns look at the profit margin (operating and financial profit divided by total operating revenue). The management score is strongly and positively associated with the profit margin, suggesting that firms with one point higher average management score have about 0.9 percentage points higher profit margin, which is substantial given that the average profit margin in the sample used for estimation is 2.2 per cent. In column (4) we look at the EBITDA margin (EBITDA divided by total operating revenue). The sample is somewhat smaller than in the previous columns, but the association between the management score and EBITDA margin is positive and significant. It suggests that firms with one point higher average management score have about 1.9 percentage point higher EBITDA margin (where the sample average EBITDA margin is 6.3 per cent). Lastly, we look at return on total assets (ROTA, defined as earnings before interest and taxes (EBIT) over total assets). It is an indicator of how effectively a company is using its assets to generate earnings before contractual obligations must be paid. ROTA indicates a firm's ability to efficiently allocate and manage its resources (but it ignores the firm's liabilities). We find that ROTA is about 0.8 percentage points higher for every one point increase in the management score (and average ROTA in the sample used for estimation in column (5) is 6.3 per cent). Overall, Table 4 suggests that the average management score is positively and significantly correlated with profitability measures.

The coefficients in tables 3 and 4 are of quantitative as well as statistical significance. While we cannot establish causality between the management scores and firm performance, the association between the two is quite strong, as shown in Chart 4. A movement from the lower quartile (-0.66) to the upper quartile (0.70) of management scores between firms is associated with an increase in operating revenue of between 9 (Table 3, column (6)) and 29 per cent (Table 3, column (1)), an increase in profit margin of about 1.2-1.3 percentage points (Table 4, columns (1) to (3)), an increase in EBITDA margin of about 2.6 percentage points (Table 4, column (4)) and an increase in return on total assets of about 1.1 percentage points (Table 4, column (5)). These results imply that the MOI survey tool is not simply measuring statistical noise.

Table 3. Estimates of firm performance equations – operating revenue

	(1)	(2)	(3)	(4)	(5)	(6)
Management z-score	0.188*** (0.037)	0.118*** (0.026)	0.103*** (0.025)	0.085*** (0.024)	0.143*** (0.0339)	0.064*** (0.020)
Ln(Labour)		0.885*** (0.026)	0.904*** (0.027)	0.673*** (0.031)	0.631*** (0.039)	0.276*** (0.027)
Ln(Capital)				0.219*** (0.020)	0.289*** (0.024)	0.117*** (0.019)
Ln(Material)						0.525*** (0.024)
Ln(% employees with a college degree)			0.105*** (0.028)	0.084*** (0.026)	0.072** (0.031)	0.057*** (0.019)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
2-digit industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country*year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Extra controls	No	No	Yes	Yes	Yes	Yes
Noise controls	No	No	Yes	Yes	Yes	Yes
Firms	1,075	1,075	1,075	1,075	696	696
Observations	5,275	5,275	5,275	5,275	3,385	3,385
R-squared	0.487	0.721	0.738	0.768	0.795	0.892

Sources: MOI survey and Orbis.

Note: * = significant at the 10% level, ** = significant at the 5% level, *** = significant at the 1% level. Dependent variable is log(operating revenue). All columns are estimated by OLS, with robust standard errors clustered by firm in brackets below coefficient. The sample is of all firms with available accounts data at some point between 2003 and 2008. The management score has a mean of 0.112 and a standard deviation of 0.987 in the sample used in columns (1)-(4) and a mean of 0.159 and a standard deviation of 0.946 in the sample used in columns (5)-(6). Extra controls comprise indicator for whether the firm is listed, log of average hours worked for production and non-production workers, and indicators for missing information on % of production and non-production employees with a college degree. Noise controls are gender, years working in the position for the respondent, the day of the week the interview was conducted, the time of day the interview was conducted, the duration of interviews, interviewer's perception of the truthfulness of the information and respondent's knowledge about the firm as well as controls for interviewer's age, gender and education.

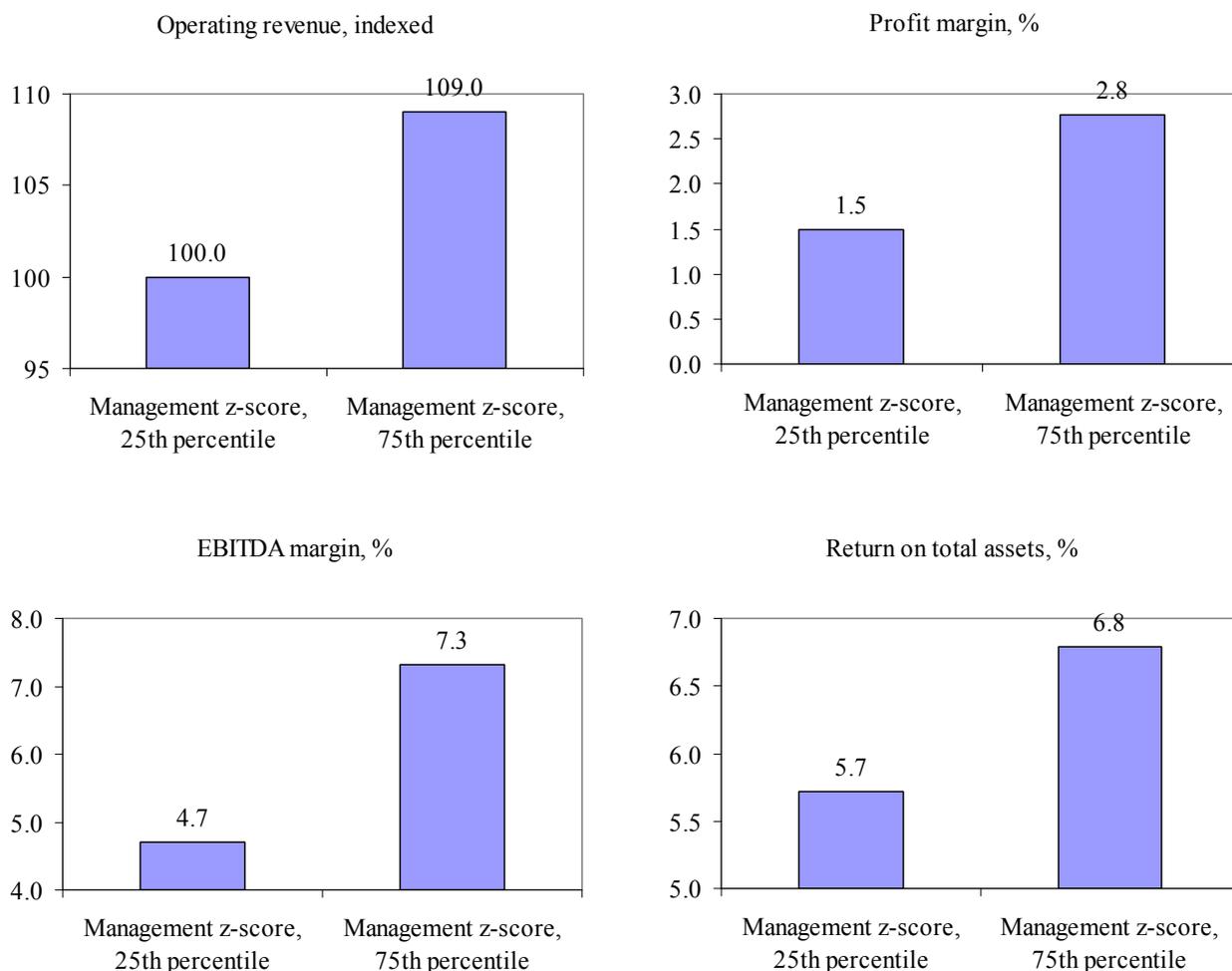
Table 4. Estimates of firm performance equations – return on total assets, profit margin and EBITDA margin

	(1)	(2)	(3)	(4)	(5)
Dependent variable	Profit margin, %			EBITDA margin, %	Return on total assets, %
Estimation	OLS	OLS	OLS	OLS	OLS
Management z-score	0.868** (0.350)	0.921*** (0.355)	0.940*** (0.357)	1.918*** (0.527)	0.785** (0.387)
Ln(Labour)		-0.491 (0.424)	-0.245 (0.487)	-1.810*** (0.661)	-0.106 (0.463)
Ln(Capital)			-0.230 (0.243)	0.929** (0.365)	-1.026*** (0.298)
Ln(% of employees with a college degree)		0.337 (0.321)	0.359 (0.321)	0.049 (0.356)	0.374 (0.360)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
2-digit industry fixed effects	Yes	Yes	Yes	Yes	Yes
Country*year fixed effects	Yes	Yes	Yes	Yes	Yes
Extra controls	No	Yes	Yes	Yes	Yes
Noise controls	No	Yes	Yes	Yes	Yes
Firms	1,070	1,070	1,070	696	1,097
Observations	5,251	5,251	5,251	3,381	5,452
R-squared	0.101	0.126	0.127	0.155	0.137

Sources: MOI survey and Orbis.

Note: * = significant at the 10% level, ** = significant at the 5% level * = significant at the 1% level. Dependent variables are winsorised at 1 per cent (0.5 per cent at each side). All columns are estimated by OLS, with robust standard errors clustered by firm. The sample is of all firms with available accounts data at some point between 2003 and 2008. The management score has a mean of 0.118 and a standard deviation of 0.982 in the sample in columns (1)-(3), a mean of 0.173 and a standard deviation of 0.933 in the sample in column (4) and a mean of 0.114 and a standard deviation of 0.983 in column (5). Extra controls comprise indicator for whether the firm is listed, log of average hours worked for production and non-production workers, and indicators for missing information on % of production and non-production employees with a college degree. Noise controls are gender, years working in the position for the respondent, the day of the week the interview was conducted, the time of day the interview was conducted, the duration of interviews, interviewer's perception of the truthfulness of the information and respondent's knowledge about the firm as well as controls for interviewer's age, gender and education.

Chart 4. Management practices and measures of financial performance



Source: MOI survey.

4.4 Other Performance Results

Another dimension of performance is firm size. As with column (1) of Table 3, we found that in most countries large firms have on average better management practices than SMEs (small and medium-sized enterprises);¹⁶ the exceptions were Kazakhstan and Ukraine. One possible explanation is of course that good management enables firms to grow. Under this interpretation, reallocation effects may be weaker in the Kazakh and Ukrainian economies than elsewhere. But a second explanation may be that there are scale economies with

¹⁶ We define SMEs as establishments with fewer than 250 employees.

management practices. For example, SMEs may find the fixed costs of hiring management consultants too large to justify given their scale of production (alternatively SMEs may not have access to management consultants or are not aware of how they could help them). MOI data suggest that large firms are more likely to have used an external consultant to help them improve an area of management than SMEs.

We also investigated disaggregating the management scores into their component questions (results available on request). Answers to individual questions on management practices tend to be positively correlated: if a firm is good at one dimension of management, then it tends to be good at all of them. Transition countries are no different from non-transition countries covered by Bloom and Van Reenen (2010) in this respect. Because of this, identifying if some practices matter more than others for firm performance is difficult. The only exception is the promotions policy which is not significantly correlated with most other management practices.

5 Factors explaining differences in management practices

As shown in Chart 3, there is a lot of heterogeneity in management practices within each country, with firms spread across most of the distribution. Country fixed effects explain less than 5 per cent of the differences in management practices in our sample, while 2-digit industry effects account for only 1.3 per cent of the differences. The proportion of explained differences is larger in non-transition countries (Germany and India) than in transition countries, but still relatively low. Together, country and 2-digit industry effects account for 5.6 per cent of the differences in management practices in transition countries in our sample and for 10.0 per cent of the differences in management practices in non-transition countries in our sample (see Table 5).

Table 5. Analysis of variance

	Management practices z-score		
	All	Transition	Non-transition
Country effects	0.0475	0.0405	0.0593
Industry effects (2-digit)	0.0133	0.0116	0.0440
Country and industry effects (2-digit)	0.0625	0.0564	0.0995
Total variance	1.0000	1.0417	0.8410

Source: MOI survey.

Note: Adjusted R-squared, except for total variance.

Several factors may help to explain the difference in firm-level management scores, among them product market competition, ownership, and education of employees. Charts 5-8 look at average management scores by some of these factors in the raw data.

5.1 Product market competition

First we look at product market competition. The importance of competitive intensity in improving productivity and management is a robust finding from a wide range of economic studies. Stronger competition can drive out poorly managed firms but can also change the behaviour of incumbent managers who have to lift their performance in order to survive and prosper. Firms where the number of competitors as perceived by managers is higher, have better management practices on average (Chart 5). We also look at this in a regression format in Table 6, creating two dummy variables, one for firms with 2 to 5 competitors and another for firms with more than 5 competitors. The omitted category is firms with zero competitors or one competitor. In column (1) of Table 6, we see that better management practices are positively and significantly associated with the managers' own self-reported measure of the number of competitors they face. The estimated coefficient on the dummy variable for firms with more than 5 competitors is 1.59-times larger than the estimated coefficient on the dummy variable for firms with 2 to 5 competitors. Increasing the number of competitors from 0-1 to 2-5 is associated with a management z-score increase of 0.150 (not significant), and increasing the number of competitors further above 5 is associated with an additional increase in management z-score of 0.088.

Competition has of course been found to play an important role in determining management practices in other contexts (Bloom and Van Reenen, 2010) and total factor productivity more generally (Syverson, 2011).

Chart 5. Management scores by number of competitors



Source: MOI survey.

5.2 Management practices and firms belonging to foreign-owned multinational

Prior to the start of transition, firms were mostly state owned and separated from the outside world, and their objective was not profit maximisation. At the beginning of transition, there were a lot of potential investment opportunities in transition economies, which were industrialised and had cheap but highly educated workforces. However, the technologies they were using were behind the technology used in the developed world and the managers of firms had little experience of “working with clients, marketing their products and reacting to demand changes” (Yudaeva et al., 2003, p. 384). Foreign direct investment (FDI) was perceived as a catalyst because it could bring “...technology and *managerial know-how* necessary for restructuring firms” (Campos and Kinoshita, 2003, p. 3).

We find that management scores of firms belonging to foreign-owned multinational companies are on average significantly higher than the management scores of firms belonging to domestically owned firms (including domestically owned multinationals). The difference is particularly striking in Lithuania and Romania (Chart 6). Furthermore, firms with foreign owners from non-transition countries have on average higher management scores than firms with foreign owners from transition countries and domestically owned firms (Chart 7). More specifically, firms with foreign owners from non-transition countries have on average statistically significantly better management practices than the other three groups (p-value for the first pair is 0.00), and domestic private or privatised firms also have statistically significantly better management practices than domestic state-owned firms (p-value is 0.04).

We examine this in a regression format in Table 6 columns (2) and (3). We look at foreign-owned multinationals regardless of the country of origin, splitting these into foreign-owned multinationals from transition and non-transition countries. A Russian owner of a Kazakh firm may not implement much better management practices than a Kazakh owner would, but a German owner might. The estimated coefficient on the indicator for the foreign-owned multinationals is always positive, but as Chart 6 hinted, this effect appears to be driven by foreign-owned multinationals with owners from non-transition countries. The coefficient on the latter is namely statistically significant, while the coefficient on the foreign-owned multinationals with owners from transition countries is not. However, this is probably due to the low incidence of foreign-owned multinationals with owners from transition countries in our sample – only 0.5 per cent of the companies in our overall sample fall into this category, and this makes it difficult to estimate the coefficient more precisely.

Again these results reflect the results for foreign multinationals using better management practices in other countries (Bloom et al., 2011b) and operating with higher productivity (Syverson, 2011).

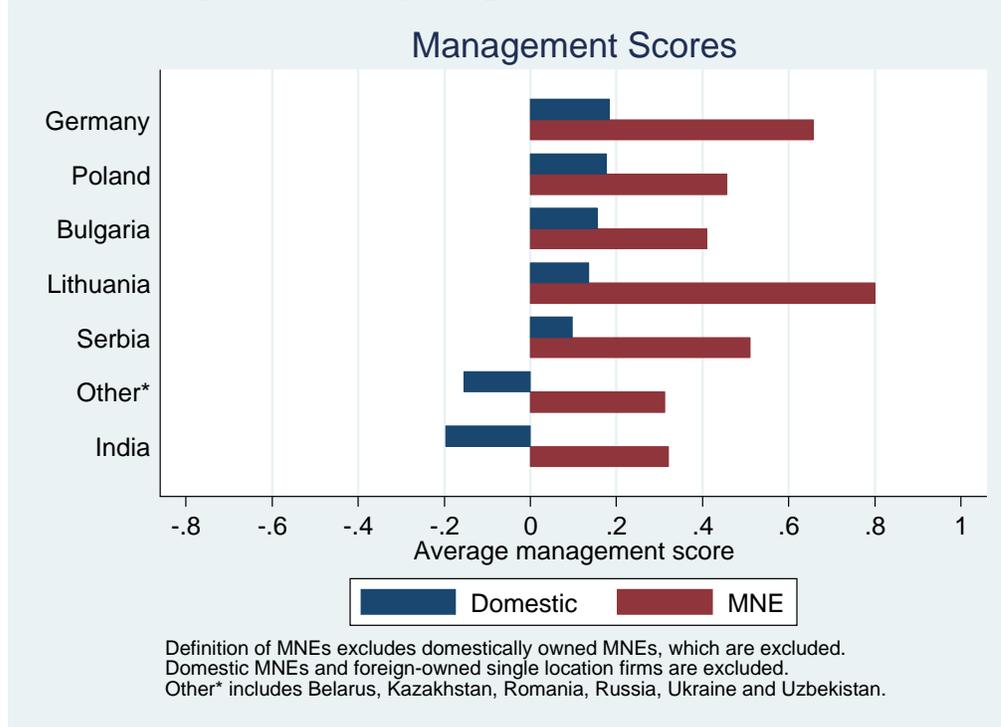
Table 6: Factors explaining differences in management practices

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2-5 competitors	0.150 (0.103)				0.159 (0.101)	0.159 (0.101)	0.150 (0.102)	0.150 (0.102)
More than 5 competitors	0.238*** (0.090)				0.267*** (0.089)	0.267*** (0.089)	0.243*** (0.089)	0.243*** (0.089)
Foreign-owned MNEs		0.313*** (0.091)			0.323*** (0.089)		0.327*** (0.090)	
Foreign-owned MNEs (transition countries)			0.340 (0.295)			0.301 (0.321)		0.324 (0.297)
Foreign-owned MNEs (non- transition countries)			0.310*** (0.097)			0.325*** (0.095)		0.327*** (0.096)
Currently state-owned				-0.138 (0.092)	-0.181** (0.085)	-0.181** (0.085)	-0.135 (0.090)	-0.135 (0.090)
Ln(% of employees with a college degree)	0.081*** (0.026)	0.082*** (0.026)	0.082*** (0.026)	0.081*** (0.026)	0.081*** (0.026)	0.081*** (0.026)	0.081*** (0.026)	0.081*** (0.026)
Country fixed effects	Yes							
2-digit industry fixed effects	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Extra controls	Yes							
Noise controls	Yes							
Firms	1,828	1,821	1,821	1,827	1,820	1,820	1,820	1,820
R-squared	0.149	0.144	0.144	0.141	0.136	0.136	0.155	0.155

Source: MOI survey.

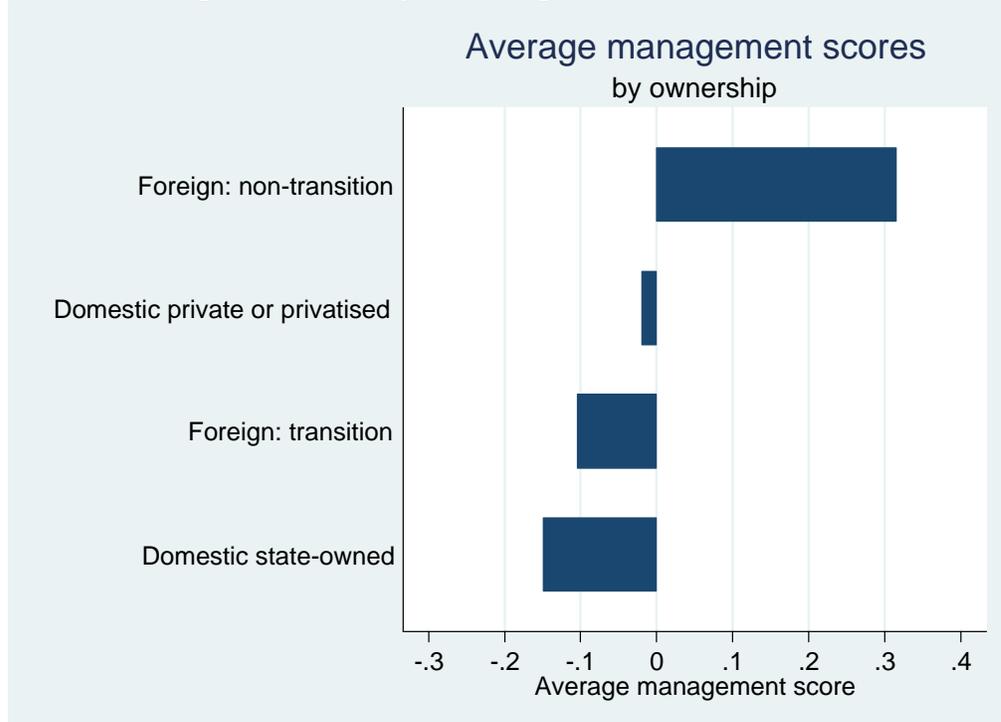
Note: * = significant at the 10% level, ** = significant at the 5% level * = significant at the 1% level. Dependent variable is management z-score. All columns are estimated by OLS, with robust standard errors, clustered by country and 2-digit industry. Extra controls comprise log of firm size (number of employees), indicator for whether the firm is listed, log of average hours worked for production and non-production workers, and indicators for missing information on % of production and non-production employees with a college degree. Noise controls are gender, years working in the position for the respondent, the day of the week the interview was conducted, the time of day the interview was conducted, the duration of interviews, interviewer's perception of the truthfulness of the information and respondent's knowledge about the firm as well as controls for interviewer's age, gender and education.

Chart 6. Management scores by foreign owned multinationals vs. domestic firms



Source: MOI survey.

Chart 7. Management scores by ownership



Source: MOI survey.

5.3 Management practices and state ownership

We also look at ownership of firms from another angle: namely, we compare currently state-owned firms with firms that were always private or that were privatised. Chart 8 shows that firms that have always been privately owned have on average the best management practices, and firms that have been privatised do not differ much from them (the null hypothesis of no differences between the two groups cannot be rejected at conventional levels of significance), while the still state-owned firms have on average the worst management practices (statistically significantly worse than always private firms at p-value 0.01 and privatised firms at p-value 0.05). This suggests that privatisation is an effective medium-term means of improvement – an encouraging result, given the importance of privatisation in transition countries.

We look at this in a formal regression format in Table 6, column (4). The estimated coefficient on the indicator for currently state-owned firms is negative, but it is not significant. It is, however, negative and statistically significant at the 5 per cent level when we do not control for 2-digit industry fixed effects (not reported here). Estimating each regression by industry we found that the state ownership variable is negative and statistically significant at the 5 per cent level in a large number of sectors.¹⁷ About 64 per cent of currently state-owned firms are in one of the industries where the estimated coefficient is statistically significant (and always negative), and they represent 16 per cent of all firms in these industries (compared to 8 per cent in the remaining industries). All these industries taken together have on average a lower management practices score than the other industries. Within this group of industries, currently state-owned firms have on average statistically significantly worse management practices while the same is not true for the group of other industries. Hence, some of the variation in management practices due to state-owned firms is picked up by the industry effects.

¹⁷ These sectors were: apparel (18), publishing, printing and reproduction of recorded media (22), chemicals and chemical products (24), fabricated metal products, except machinery and equipment (28), machinery and equipment n.e.c. (29), office, accounting and computing machinery (30), medical, precision and optical instruments, watches and clocks (33), radio, television and communication equipment and apparatus (32), other transport equipment(35) and recycling (37), food products and beverages (15) and tobacco products (16).

Chart 8. Management scores by privatisation status



Source: MOI survey.

5.4 Management practices and human capital

Average education level of employees may also be correlated with the quality of management practices. We have included percentage of employees with a completed college degree among the controls in all of our estimations and the estimated coefficient is always positive and significant at the 1 per cent level of significance. This could be because such employees are more familiar with the best practices used in their line of work and are more supportive to implementing them in their workplace.

We have shown that competition, belonging to foreign-owned multinationals, and average education level of employees are (positively) associated with management scores on their own. We also estimate the association between management scores and these factors jointly in columns (5) to (8) of Table 6, finding our results robust to this and a variety of samples and controls.

6 Summary and concluding remarks

We have shown that management practices differ across countries and across firms within countries. They are positively associated with various measures of firm performance, such as productivity, profit margin, EBITDA margin and return on total assets: an improvement in management practices scores from the lower to the upper quartile of their distribution is associated with around 9 per cent increase in operating revenue, an increase in profit margin by more than 85 per cent, an increase in EBITDA margin by more than 55 per cent and an increase in the return on total assets by almost 20 per cent. Given that they are associated with firm performance, they may also be an important explanation for the differences in productivity between firms and countries.

Several factors seem important in influencing management quality, in particular product market competition, ownership and level of human capital. Important policy implications or lessons can be drawn from all of these. Stronger competition can drive out poorly managed (and performing) firms, but also change the behaviour of incumbent managers who have to improve their performance in order to survive and prosper. Aghion et al. (2010) show that levels of product market competition in transition economies (measured in terms of average profit mark-ups) have increased substantially since the beginning of the 1990s, but they remain below the OECD average and there is in general less competition the further east you go (also EBRD 2008, 2009). The level of product market competition of course varies by sector, reflecting the stages of development of industries, but it is primarily determined by the efficiency and effectiveness of competition policy.

Ownership matters as well. Our analysis shows that firms belonging to foreign multinationals with owners from non-transition countries have the best management practices. There is also some evidence, albeit weaker, that state-owned firms tend to have the worst management practices. The good news is that privatised (formerly state-owned) firms do not differ significantly from firms that were privately owned from the beginning in terms of the quality of management practices. This suggests that privatisation is an effective medium-term means of improvement (the actual result is likely to depend on the new owners and possibly the

transparency of the privatisation process), and that openness to foreign investment is key to spreading best practice.

Finally, management practices are also positively associated with the level of human capital, as measured by the percentage of employees with a completed college degree. It is plausible that it might be easier to implement the best management practices when the workforce is more knowledgeable and may even suggest initiatives to improve the operational process. Inadequately educated labour force was consistently named as one of the top three business obstacles in virtually all transition countries covered by BEEPS in 2008-09, which indicates that businesses are becoming more aware of the importance of suitable education and are hitting on a serious constraint in developing their businesses further. More basic business education and better, more effective education in general could help to improve management practices and foster growth of businesses.

References

P. Aghion, H. Harmgart and N. Weisshaar (2010), “Fostering growth in CEE countries: a country-tailored approach to growth policy”, EBRD Working Paper No. 118, October 2010.

N. Bloom, B. Eifert, A. Mahajan, D. McKenzie and J. Roberts, (2011a), “Does management matter: Evidence from India”, NBER Working Paper 16658.

N. Bloom, R. Sadun and J. Van Reenen (2011b), “Americans do I.T. Better. US multinationals and the productivity miracle”, forthcoming *American Economic Review*.

N. Bloom and J. Van Reenen (2007), “Measuring and explaining management practices across firms and countries”, *Quarterly Journal of Economics*, Vol. 122, No. 4, pp. 1351-1408.

N. Bloom and J. Van Reenen (2010), “Why do management practices differ across firms and countries?”, *Journal of Economic Perspectives*, Vol. 24, No. 1, pp. 203-224.

T. Bresnahan, E. Brynjolfsson and L. Hitt (2002), “Information technology, workplace organisation, and the demand for skilled labor: firm-level evidence”, *Quarterly Journal of Economics*, Vol. 117, No. 1, pp. 339-76.

J. D. Brown, J. S. Earle and A. Telegdy (2006), “The productivity effects of privatization: Longitudinal estimates from Hungary, Romania, Russia, and Ukraine”, *Journal of Political Economy*, Vol. 114, No. 1, pp. 61-99.

N. F. Campos and Y. Kinoshita (2003), “Why does FDI go where it goes? New evidence from the transition economies”, IMF Working Paper No. 228.

EBRD (2008), Transition Report 2008: Growth in transition. Chapter 3: Fostering growth in transition economies.

EBRD (2009), Transition Report 2009: Transition in Crisis? Chapter 5: Transition: where does it stand and where should it go?

EBRD (2010), Transition Report 2010: Recovery and Reform. Chapter 5: Evaluating and improving the business environment.

J. Gwartney and R. Lawson with H. Grubel, J. de Haan, J.-E. Sturm and E. Zandberg (2009), “Economic Freedom of the World: 2009 Annual Report”, Vancouver, BC: The Fraser Institute. Data retrieved from www.freetheworld.com.

S. Estrin, J. Hanousek, E. Kočenda and J. Svejnar (2009), “The effects of privatization and ownership in transition economies”, *Journal of Economic Literature*, Vol. 47, No. 3, pp. 699-728.

G. S. Olley and A. Pakes (1996), “The Dynamics of Productivity in the Telecommunications Equipment Industry”, *Econometrica*, Vol. 64, No. 6, pp. 1263–1297.

G. Sharma (2008), “Competing or collaborating siblings? Industrial and trade policies in India”, mimeo (http://bengal.missouri.edu/~sharmag/Feb08_Delicensing_Latest.pdf)

W. Steffen and J. Stephan (2008), “The role of human capital and managerial skills in explaining productivity gaps between East and West”, *Eastern European Economics*, Vol. 46, No. 6, pp. 5-24.

C. Syverson, (2011), “What determines productivity at the micro level?”, *Journal of Economic Literature*, Vol. 49, No. 2, pp. 326-365.

K. Yudaeva, K. Kozlov, N. Melentjeva and N. Ponomareva (2003), “Does foreign ownership matter? The Russian experience”, *Economics of Transition*, Vol. 11, No. 3, pp. 383-409.

V. Zelenyuk and V. Zheka (2006), “Corporate governance and firm’s efficiency: the case of a transitional country, Ukraine”, *Journal of Productivity Analysis*, Vol. 25, pp. 143-157.

Appendix A: Details of the survey questions and management practice scoring

Operations

Practice 1

R.1	What normally happens when a process problem arises, for example, machinery break-down, human errors or failures in communication?
-----	------------------------------------------------------------------------------------------------------------------------------------

	Score in questionnaire	Management score
Nothing is done about it.	1	1
We fix it but do not take further measures.	2	2
We fix it and take measures to make sure that it does not happen again.	3	3
We fix it and take measures to make sure that it does not happen again and we also have a continuous improvement process to anticipate problems.	4	4
Don't know	-9	.
Refusal	-8	.

Monitoring

Practice 2

R.2a	How many production performance indicators are monitored in this establishment?
------	---------------------------------------------------------------------------------

	Score in questionnaire	Management score
None.	1	1
One or two production performance indicators (for example, volume and quality).	2	2
More than two production performance indicators.	3	3
Don't know	-9	1
Refusal	-8	.

Practice 3

R.2b	How frequently are these production performance indicators collected in this establishment?
------	---------------------------------------------------------------------------------------------

	Score in questionnaire	Management score
Yearly	1	1
Quarterly	2	2
Monthly	3	3
Weekly	4	4
Daily	5	5
Hourly	6	6
Don't know	-9	1

Practice 4

Note: The answers to this question were recoded on the basis of the answers in the "Other" category.

R.2c	How frequently are production performance indicators shown to factory managers?
------	---------------------------------------------------------------------------------

	Score in questionnaire	Management score
Annually		2
Semi-annually		3
Quarterly	1	4
Monthly	2	5
Weekly	3	6
Daily	4	7
Hourly	5	8
Never	6	1
Other	7	Recoded where possible, otherwise .
Don't know	-9	.

Practice 5

Note: The answers to this question were recoded on the basis of the answers in the “Other” category.

R.2d	How frequently are production performance indicators shown to workers?
------	------------------------------------------------------------------------

	Score in questionnaire	Management score
Annually		2
Semi-annually		3
Quarterly	1	4
Monthly	2	5
Weekly	3	6
Daily	4	7
Hourly	5	8
Never	6	1
Other	7	Recoded where possible, otherwise .
Don't know	-9	.

Practice 6

R.2e	Where in the factory building are the production display boards showing output and other production performance indicators located?
------	-------------------------------------------------------------------------------------------------------------------------------------

	Score in questionnaire	Management score
There are no display boards anywhere.	1	1
They are all located in one place.	2	2
They are located at multiple places.	3	3
Don't know	-9	1

Practice 7

R.3	How often are production performance indicators reviewed by top or middle managers?
-----	-------------------------------------------------------------------------------------

	Score in questionnaire	Management score
They are continually reviewed.	1	3
They are periodically reviewed.	2	2
They are rarely reviewed.	3	1
Don't know	-9	.
Refusal	-8	.

Practice 8

R.6	Does this establishment use any production performance indicators to compare different teams of employees in the production line, in different shifts, or similar?
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	Score in questionnaire	Management score
Yes	1	2
No	2	1
Don't know	-9	.

Targets

Practice 9

R.4	What is the timescale of this establishment's production targets for its main product?
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	Score in questionnaire	Management score
The main focus is on short-term (less than one year) production targets for the main product.	1	2
There are short- and long-term (more than three years) production targets for the main product, but they are set independently.	2	3
There are integrated short- and long-term production targets for the main product.	3	4
There are no production targets set for the main product.	4	1
Don't know	-9	1
Refusal	-8	.

Incentives

Practice 10

R.7	How do you reward this establishment's production target achievement?
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	Score in questionnaire	Management score
There are no rewards.	1	1
Only top and middle management is rewarded.	2	2
All staff is rewarded.	3	3
Don't know	-9	.
Refusal	-8	.

Practice 11

O.14	Which of the following best corresponds to the main way employees are promoted in this establishment?
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	Score in questionnaire	Management score
Promotions are based solely on individual's effort and ability.	1	3
Promotions are based partly on individual's effort and ability, and partly on other factors such as tenure (how long they have worked at the firm).	2	2
Promotions are based mainly on factors other than on individual's effort and ability, such as tenure.	3	1
Other	4	.
Does not apply	-7	.
Don't know	-9	.

Practice 12

O.15	Which of the following best corresponds to this establishment's main policy when dealing with employees who do not meet expectations in their position?
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	Score in questionnaire	Management score
They are rarely or never moved from their position.	1	1
They usually stay in their position for at least a year before action is taken.	2	2
They are rapidly helped and re-trained, and then dismissed if their performance does not improve.	3	3
Other	4	.
Does not apply	-7	.
Don't know	-9	.

Exhibit 1: Examples of good management practices – two multinational factories

Food company with a clear production floor, demarked areas (floor markings) and continuous output monitoring and control



Pharmaceutical company with a clear production floor and detailed monitoring of the production process



Source: EBRD.

Exhibit 2: Examples of poor management practices – wood and clay products

Factory in Central Asia, with disorganised and excessive inventory, messy working conditions and poor safety (cutting tools being used with no protective clothing)



Brick factory in dirty conditions, no production monitoring and excessive manning



Source: EBRD.

Exhibit 3: Examples of poor management - metal products

Aluminium factory with dirty working conditions (making leaks very hard to spot), poor insulation and no process-wise monitoring



Metal fittings company with raw materials littering the factory floor, no production metrics on display and tools left lying around



Source: EBRD.