

ANNEX B: METHODOLOGY

Using a scoring grid developed in conjunction with McKinsey and Company, researchers from LSE have measured management practices across 21 countries in North and South America, Europe, Asia and Australasia for the World Management Study (WMS).¹ Singapore is the 22nd country to conduct the WMS. This section elaborates on the study's methodology.

For each firm, management practices are identified and scored through conversation-based interviews over the telephone.² Interviewers involved in the Singapore study collected management data from 408 manufacturing firms over a span of four months in 2012. The firms interviewed were selected from a sampling frame provided by the Department of Statistics covering firms with between 50 and 5,000 workers.³

Prior to data collection, the interviewers were trained by an LSE consultant familiar with the WMS methodology on how to schedule interviews, collect accurate responses, and score management practices using the WMS instrument.

In all, eighteen elements of management, which can be grouped into the following four dimensions of management, were scored:

1. **Operations management:** this measures whether companies have adopted lean manufacturing techniques to meet their business objectives
2. **Monitoring management:** this measures how well companies monitor what goes on inside their firms and use this for continuous improvement
3. **Targets management:** this measures whether companies are setting the right targets, tracking the right outcomes, and taking appropriate actions if the two are inconsistent

¹ Bloom, Nicholas and John Van Reenen, "Measuring and Explaining Management Practices Across Firms and Countries", *The Quarterly Journal of Economics* 122 (4): (2007), p.1351-1408.

² Interviews were conducted with plant managers as they were directly responsible and involved with the firm's manufacturing operations. All interviews were conducted in a conversational mode via phone, and on average took 61 minutes.

³ A sample of 1,557 Singapore firms with 50 to 5,000 employees was obtained from the Department of Statistics. All the firms in this sample were contacted for interviews. A response rate of 26.6% was obtained (firms in the sampling frame without contact numbers were excluded).

4. **People management:** this measures whether companies are promoting and rewarding employees based on performance, and trying to hire and keep their best employees

The eighteen elements of management, categorised under the four broad dimensions described above, are provided in Table 1.

Operations management	Monitoring management
1. Introduction of lean manufacturing techniques 2. Rationale for lean manufacturing techniques 3. Process documentation	4. Performance tracking 5. Performance review 6. Performance dialogue 7. Consequence management
Targets management	People management
8. Targets breadth 9. Targets interconnection 10. Targets time horizon 11. Targets are stretching 12. Performance clarity and comparability	13. Instilling a talent mindset 14. Rewarding high performance 15. Removing poor performers 16. Promoting high performers 17. Attracting talent 18. Retaining talent

Table 1: Management practice dimensions and elements

Element	Score	Description	Example
Performance clarity and comparability	1	Performance measures are complex and not clearly understood. Individual performance is not made public.	A UK manufacturer's performance measures are complicated and archaic, including a number of measures which are beyond the control of the teams (i.e. like cutting times which are mainly driven by the age and water content of the wood). Little effort is made to communicate either individual or aggregate performance.
	3	Performance measures are well defined and communicated; performance is public in all levels but comparisons are discouraged.	A UK manufacturer communicates performance measures to all workers in the form of detailed, ongoing project plans and benchmarking reports.
	5	Performance measures are well defined, strongly communicated and reinforced at all reviews; performance and rankings are made public to induce competition.	At a US manufacturer, 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. Quarterly company meetings seek to review performance and align targets.

Table 2: Example of a targets management question and associated scoring grid