

## **Sampling Methodology of Malaysia Productivity and Investment Climate Survey 2007**

1. This document provides a detailed explanation of the sampling design for the Productivity Investment Climate Survey 2007 (PICS 2007) that was conducted in the fiscal year 2007-2008. This following sections document the objectives of the sampling methodology, sampling frame, and sample design.

### **Objectives of Sampling Methodology**

2. The PICS II sampling methodology generates sample sizes appropriate to achieve two main objectives:

- Benchmark productivity, the investment climate, competitiveness, and growth in Malaysia;
- Identify the key constraints to competitiveness as perceived by firms in the manufacturing and selected business support services sectors;
- Highlight the key concerns regarding regulatory burden, skills shortages and weak innovation capabilities; and
- Enable the analysis of firm performance focusing on determining how investment climate constraints affect productivity and job creation in selected sectors.

In order to achieve the above objectives, the sampling methodology of PICS II: (1) generates a sample representative of the whole economy that substantiates assertions about the manufacturing and business support services sectors; and (2) generates large enough sample sizes for selected industries to conduct statistically robust analyses.

### **Sampling Frame**

3. The sampling frame is extracted from the Central Register of Establishments (SIDAP) maintained by the Department of Statistics, Malaysia. The register is updated using information supplied by the Companies Commission of Malaysia (CCM), Employees Provident Fund (EPF), the 2006 Economic Census data, and several regular surveys or censuses conducted by the Department of Statistics, Malaysia (DOSM). Since very small establishments would contribute insignificant information and a substantial portion of the information required is not relevant to small establishments, these establishments are excluded from the survey. Tables 1 and 2 present the employment thresholds for manufacturing and business support services industries, respectively. For the manufacturing sector, only establishments with more than 10 employees are covered. For the business support services sector, two employment thresholds are used. Only establishments with more than 10 employees are covered for Information Technology, Telecommunications, and Advertising & Marketing, while only establishments with more than 20 employees are covered for Accounting & Related Services and Business Logistics.

**Table 1: Employment Thresholds for Manufacturing Industries**

<b>Manufacturing</b>	<b>Employment Threshold</b>
1. Food Processing (15)	
2. Textiles (17)	
3. Garments (18)	
4. Wood & Wood Products (20)	
5. Chemicals & Chemical Products (24)	
6. Rubber and Plastics (25)	
7. Machinery and Equipment (29)	
8. Office, Accounting, & Computing Machinery (30)	More than 10 employees
9. Electrical Machinery & Apparatus (31)	
10. Electronics (Equipment & Components) (32)	
11. Motor Vehicles and Parts (34)	
12. Furniture (36)	

**Table 2: Employment Thresholds for Business support Services Industries**

<b>Services</b>	<b>Employment Threshold</b>
1. Information Technology	
2. Telecommunications	
3. Advertising & Marketing	More than 10 employees
4. Accounting & Related Professional Services	
5. Business Logistics (Transportation & Related Services)	More than 20 employees

## Sample Design

### *Sample Size*

4. PICS 2007 covers 1,200 establishments in the manufacturing sector and 300 establishments in the services sector. The total sample size for each sector is based on practical considerations, particularly the time constraints of canvassing lengthy questionnaires within a short duration. The total number of establishments in the frame and those sampled are summarized in Table 3.

**Table 3: Survey Frame and Sample Size by Sector**

<b>Sector</b>	<b>Number of Establishments</b>	
	<b>Frame</b>	<b>Sample</b>
Manufacturing	3,322	1,200
Services	2,502	300
Total	5,824	1,500

### *Sample Selection*

5. A single-stage stratified systematic sampling is used in drawing samples. The sampling frame is stratified by sector, region, state, and industry. Within each sector, the total sample size is distributed to the substrata based on proportional allocation, as follows:

$$n_{ijk} = N_{ijk} \times \frac{n}{N}$$

where  $n_{ijk}$  = sample size for industry  $i$ , region  $j$  and area  $k$   
 $N_{ijk}$  = total number of establishments in industry  $i$ , region  $j$  and area  $k$   
 $n$  = total sample size for the sector  
 $N$  = total number of establishments in the sector

To select the sample, for each sector, establishments within each industry, region and area combination are arranged according to the value of output. Selection is then carried out independently for each sub-stratum based on a linear systematic method.