TECHNICAL NOTES

1. OBJECTIVE

The main objective of this publication is to provide statistics on the latest trend of main indicators in the Manufacturing sector, ie. ***sales value, number of employees, salaries & wages*** *and* ***the production of main products manufactured*** *which is collected through Monthly Manufacturing Survey. This statistics assists users in policy formulation and decision making.*

2. BENCHMARKING

After conducting the Economic Census 2016 (reference year 2015), Department of Statistics Malaysia (DOSM) has reviewed and carried out the benchmarking process towards the manufacturing statistics collected from the Monthly Manufacturing Survey. The benchmarking process is done to enable the series of values of annual estimates derived from short term survey consistent and match with the annual value from census/annual survey of the benchmark year. The benchmark process adapted the guideline of the Quarterly National Accounts Manual 2017 edition, International Monetary Fund to meet the objectives as follows:

a. *to estimate monthly data that are temporally consistent with the annual data: that is, to ensure that the sum of the monthly data is equal to the annual benchmark;*
b. *to preserve as much as possible the monthly movements in the indicator under the restrictions provided by the annual data; and*
c. *to ensure, for forward series, that the sum of the monthly of the current year is as close as possible to the unknown future annual data.*

The benchmarking statistics is compiled on sales value, number of employees and salaries & wages and being published starting from January 2020. The base (benchmark) year using the Economic Census 2016 (reference year 2015) and pro rata (1) and extrapolation method (2) is used in the benchmarking process.

Pro rata Method:

$$M^{i}V = \frac{M^{i}I}{\sum_{i=1}^{12} M^{i}V} \times ADT \qquad (1)$$

where;

$M^{i}V$ = *new derived monthly variables estimates*
$M^{i}I$ = *monthly indicator series*
ADT = *annual benchmark data*

Extrapolation Method:

$$V_t = V_{t-1} * G_{t-1,t} \qquad (2)$$

Where;

V_t = *value of variable*
$G_{t-1,t}$ = *growth from t-1 to t*

TECHNICAL NOTES

3. SCOPE AND COVERAGE

Data collected in the Monthly Manufacturing Survey covered the whole of Malaysia. Since January 2020, this publication presents weighted statistics which represent the population sample of 251 industries in Manufacturing sector. Data for industries with less than three establishments was combined to the closest industry to ensure the confidentiality of the respondents as stipulated under the Statistics Act 1965 (Revised-1989).

4. SOURCE OF FRAME

The source of frame is from Malaysia Statistical Business Register (MSBR) where the main information is from census and survey conducted by the Department of Statistics Malaysia (DOSM) and administrative data. The main source of the administrative data is from the Companies Commission of Malaysia (CCM). In addition, DOSM also collaborates and yield information from over 50 other agencies such as the Employees Provident Fund (EPF), Royal Malaysian Customs Department (RMCD), Inland Revenue Board (IRB), Local Authorities and other Professional Bodies. The frame is updated continuously by taking into account of new establishments and to record any changes in the establishment status such as closed down, not in operation, change in types of activity and location or postal addresses to ensure that the information in the frame is at the most current status.

5. TYPE OF BUSINESS ACTIVITY

Type of business activity is divided into primary and secondary. The primary activity refers to the activities which focus on its main resources and income. Secondary activities are defined as those incidental or ancillary to the primary activity. The classification of the establishment's industry is based on the primary activity and the Malaysia Standard Industrial Classification (MSIC 2008) Version 1.0 according to the International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4, United Nations, with modifications to suit local conditions.

6. CONCEPT AND DEFINTION

Concepts and definitions used are in line with the manual of Recommendations for Industrial Statistics 2008, United Nations Statistics Division. The definition of manufacturing used in this survey is consistent with Malaysia Standard Industrial Classification (MSIC) 2008 Ver. 1.0.

Manufacturing is defined as the physical or chemical transformation of materials or components into new products, whether the work is performed by power-driven machines or by hand, whether it is done in a factory or in the worker's home, and whether the products are sold at wholesale or retail.

TECHNICAL NOTES

7. SAMPLING DESIGN

Sampling design of the survey is a one-stage stratified random sampling. The establishment is classified as sampling unit while a few categories of stratum was identified.

Each stratum has been set up to three substrata to ensure the distributed sample takes into account the economic characteristics of the stratum. The main substratum is heterogeneous and was fully covered. Whereas, other substratum that are homogeneous were sampled.

Main substratum include large establishments which have a significant total revenue in the respective industry while for the second and third substratum are based on small and medium enterprise (SME) categories.

8. SAMPLE SIZE

The main statistics used to estimate the sample size is the sales value. The formula used in the estimation of the sample size for a stratum is as follows:

$$n = \frac{\left(\sum N_i S_i\right)^2}{V + \sum N_i S_i^2} \qquad (3)$$

where;

n = *Sample size*

N_i = *Population size for stratum* i

S_i^2 = *Variance for stratum* i

V = *Desired variance*

$$V = RSE^2 \cdot \left(\frac{\hat{Y}_i}{Z}\right)^2 \qquad (4)$$

where;

$\hat{Y}_i$ = *Estimated sales value for stratum*

RSE = *Relative standard error*

Z = *Value of confidence level*

Sample is distributed to substratum of the industry using Neyman Allocation method as follows:

$$n_{hi} = \left(\frac{N_h S_h}{\sum N_h S_h}\right) n_i' \qquad (5)$$

h = *2, 3 and 4*

i = *1, 2,...* k

where;

n_{hi} = *Sample size for substratum* h *of stratum* i

N_h = *Population size for substratum* h

S_h = *Standard deviation for substratum* h

n_i = *Sample size for stratum* i

h = *Substratum*

i = *Stratum*

Establishments of the main substratum were fully covered while establishments of the second and third substratum were randomly selected using systematic random sampling.

9. WEIGHTED

Weighted analysis is done using sampling weight to ensure that the selected sample can reflect population survey. The weights required are the sampling design and non response weights.

The sampling design weight for the establishment at substratum h *is as follows:*

$$W_h = \frac{N_h}{n_h}, \quad h = 1, \ldots, 4 \tag{6}$$

where,

N_h = *Total population of substratum* h *; and*

n_h = *Total sample of substratum* h

TECHNICAL NOTES

Non response weight at substratum h *as below:*

$$NRW_h = \frac{1}{n'_h / n_h}, \quad h = 1, ..., 4$$

where,

n'_h = *Number of response in sample size for substratum* h

n_h = *Number of sample size for substratum* h

The method of calculating the sampling design weight after the survey (adjusted weight) on substratum h *as below:*

$$W'_h = W_h \times NRW_h, \quad h = 1, ..., 4 \tag{8}$$

where,

W_h = *Sampling design weight at substratum* h

NRW_h = *Non response weight at substratum* h

10. REPORTING UNIT

The reporting unit used in the survey was the ***establishment****. An establishment is defined as "an economic unit engaged in one activity, under a single legal entity and operating in a single physical location". Each establishment was assigned an industry classification based on its principal activity. In the case of a multi-activity entity, units engaged in separate activities in the same location constituted distinct establishments. Thus, each branch of a multi-branch organisation at a different location was conceptually treated as a different establishment. The establishment was requested to give separate returns for each activity in terms of value. However, if in practice, the accounts were centrally kept such that it was not possible to obtain separate data for each individual unit or branch. The entity or enterprise was treated as a single reporting unit and allowed to submit a consolidated questionnaire covering all the units or branches.*

TECHNICAL NOTES

11. VALUE OF SALES

The reported sales value refers to the sales value of their own products. This relates to sales of goods made on the reporting month, whether the products were produced/ manufactured by the establishment during the month or in the other months previously. The sales value was net selling price (ex-factory) value relating to the quantity sold. The valuation price charged to customers were excluding:

a. discounts or rebates;

b. Charges for carriage outwards;

c. commissions to selling agents;

d. all other charges such as excise duties paid, sales tax collected by the factory on behalf of the government; and

e. Installation, repairs and construction charges.

12. NUMBER OF PAID EMPLOYEES

Number of paid employees cover as follows:

a. Paid employees (full-time) - Refers to those who work for at least 6 hours a day and 20 days a month; and

b. Paid employees (part-time) - Refers to all paid workers who work for less than 6 hours a day and/or less than 20 days a month.

13. SALARIES & WAGES PAID

Salaries & wages paid refers to all cash payments, including bonuses, commissions, overtime wages, cost of living allowances and other allowances made to all employees during the reference month. The employees' contribution to Employees' Provident Fund (EPF) and Social Security Organisation (SOCSO) is included but the employer's contribution is excluded. Allowances to working proprietors, working partners and unpaid family workers and severance and termination pay are not included.

14. CONFIDENTIALITY REQUIRED

The survey is conducted under the provisions of the Statistics Act 1965 (Revised-1989). The Act stipulates that the contents of individual returns are CONFIDENTIAL. In conformity with the stipulations of this Act, only aggregated figures are published.

TECHNICAL NOTES

15. REVISIONS

Revisions will be made to the published figures based on the latest data available.

16. ROUNDING

The sum of the component figures may not tally with the sub-total or total figures due to rounding.

17. SYMBOLS AND ABBREVIATIONS

The following symbols have been used throughout the publication:-

n.e.c. : not elsewhere classified

RM : Malaysian Ringgit

r : revised

18. SEASONAL ADJUSTMENT

Time-series data are very useful for economists, policy & decision makers and time-series analysts to identify the important features of economic series such as direction, turning point and consistency between other economic indicators. Sometimes this feature is difficult to observe because of seasonal movements. Thus, if the seasonal effect can be removed, the behaviour of the series would be better viewed. The estimation and removal of the seasonal effects is called seasonal adjustment.

Seasonal adjustment is a process to identify and to remove the regular within-a-year seasonal pattern, which may also include the influences of moving holidays and working/ trading days effect in each period. The ultimate objective of the process is to highlight the underlying trends and short-term movements in the series.

In Malaysia, most of the time series data are affected by seasonal effects. Hence, to eliminate the seasonal effect as well as to seasonally adjust the Malaysian economic time series data, a standard seasonal adjustment package, X-12 ARIMA was used by Department of Statistics, Malaysia. Malaysian economic time series data also often affected by major religious festivals such as Eid-ul Fitr for Muslims, Chinese New Year to the Chinese and the Indian Deepavali. These festivals' dates are fixed according to the lunar year but vary according to the Gregorian calendar. Therefore, to estimate and remove moving holiday effect from time-series data, a procedure was developed, namely Seasonal Adjustment for Malaysia (SEAM).