## *1. Introduction*

*The Volume Index of Wholesale & Retail Trade was first developed in 2008 in stages with the Retail Trade and Motor Vehicles. In 2009, the Volume Index of Wholesale Trade was constructed and subsequently the Composite Volume Index of Wholesale & Retail Trade was compiled beginning third quarter 2010. The Volume Index of Wholesale & Retail Trade was released to public commencing for reference of first quarter 2012. The Volume Index of Wholesale & Retail Trade is used to assess the current performance of sales activity in the Wholesale Trade, Retail Trade and Motor Vehicles sub-sectors.*

## *2. Objectives*

*The objectives of the compilation of the Volume Index of Wholesale & Retail Trade are:*

a. *Measure quarterly and annual changes on the pattern and performance of Wholesale, Retail and Motor Vehicles sub-sectors;*

b. *Provide relevant and timely information on the performances of distributive trade activities; and*

c. *Produce a quick indication of the changes in the trend of consumer spending.*

## *3. Type of Index*

*The Volume Index of Wholesale & Retail Trade measured in the reference period as compared to the base period, (2015=100).*

## *4. Data Sources*

*The Volume Index of Wholesale & Retail Trade is compiled from the Monthly Survey of Wholesale & Retail Trade. All establishments covered in survey are selected in the index compilation.*

## *5. Scope and Coverage*

*The Volume Index of Wholesale & Retail Trade covers 179 industries which encompasses the Volume Index of Wholesale Trade, Retail Trade and Motor Vehicles.*

*The **Volume Index of Wholesale Trade** covered seven groups as below:*

a. *Wholesale on a fee or contract basis*
b. *Wholesale of agricultural raw materials and live animals*
c. *Wholesale of food, beverages and tobacco*
d. *Wholesale of household goods*
e. *Wholesale of machinery, equipment and supplies*
f. *Other specialised wholesale*
g. *Non - specialised wholesale trade*

*The **Volume Index of Retail Trade** covered nine groups as below:*

a. *Retail sale in non-specialised stores*
b. *Retail sale of food, beverages and tobacco in specialised stores*
c. *Retail sale of automotive fuel in specialised stores*
d. *Retail sale of information and communications equipment in specialised stores*
e. *Retail sale of other household equipment in specialised stores*
f. *Retail sale of cultural and recreation goods in specialised stores*
g. *Retail sale of other goods in specialised stores*
h. *Retail sale via stalls and markets*
i. *Retail trade not in stores, stalls or markets*

*The **Volume Index of Motor Vehicles** covered four groups as below:*

a. *Sale of motor vehicles*
b. *Maintenance and repair of motor vehicles*
c. *Sale of motor vehicles parts and accessories*
d. *Sale, maintenance and repair of motorcycles and related parts and accessories*

*The classification of the industry used is based on the Malaysia Standard Industrial Classification (MSIC) 2008. The MSIC 2008 is in line with the International Standard Industrial Classification (ISIC), Revision 4, United Nations Statistics Division.*

## *6. Weights*

*Commencing first quarter 2023, the weights used in the calculation of the Volume Index of Wholesale & Retail Trade are based on value added obtained from the Wholesale & Retail Trade Census 2019 (reference year 2018).*

*The weights of the industry are obtained from the ratios of the total value added to the sub-sector and group covered in the Wholesale & Retail Trade Census 2019 (reference year 2018). The weights are computed using the following formula:*

Where:

$$W_{ij} = \frac{V_{ij}}{V_j}$$

$\mathbf{W}_{ij}$ *is the relative share of industry **i** to the group **j**;*

$\mathbf{V}_{ij}$ *is the total value added of industry **i** of group **j**; and*

$\mathbf{V}_{j}$ *is the total value added of group **j***

## *7. Computational Procedures*

*Effective with release of publication for the reference of first quarter 2016, Laspeyres Chain Index method was used in the calculation of the Volume Index of Wholesale & Retail Trade.*

*The Volume Index of Wholesale & Retail Trade are calculated as a chain of fixed-basket indices. This means that a sequence of fixed-basket indices has been chained together to create a continuous time series. This is necessary to avoid having breaks in an index when a basket update is performed.*

*In order to chain indices across baskets, annual chain-linked monthly Laspeyres is used. The link month is at December 2022.*

$I_{2015:\ t\ \text{chained}} = I_{2018:\ t} \times I_{2015:\ \text{Dec 2022}} / I_{2018:\ \text{Dec 2022}}$

| | |
|---|---|
| $I_{2015:\ t\ \text{chained}}$ | *is a chained index for the sales observation period **t** with sales reference equal to 2015.* |
| $I_{2018:\ t}$ | *is an index for the sales observation period **t** with 2018 as the sales reference period.* |
| $I_{2015:\ \text{Dec 2022}}$ | *is an index for December 2022 with 2015 as the sales reference period.* |
| $I_{2018:\ \text{Dec 2022}}$ | *is an index for December 2022 with 2018 as the sales reference period.* |

*In the case of the chain index, the weighted averages of indices of lower level groups or industry do not match those of the corresponding upper level groups (the chain index has no additivity).*

*The Volume Index of Wholesale & Retail Trade is generated by aggregating the sales value of establishments belonging to the same industry and deflated the aggregate value using price deflator. The Laspeyres formula is used to compile these indices.*

*Thus, index for the sub-sector group **i** of sub-sector **j**:*

$$I_{ij,t} = \frac{R_{ij,t}}{R_{ij,0}} \times 100$$

*Where:*

| | |
|---|---|
| $I_{ij,t}$ | *refers to the computed sales relative for industry **i** of group **j** at time **t** (current period);* |
| $R_{ij,t}$ | *is the aggregated sales which deflated with price deflator for industry **i** of group **j** at time **t** (current period); and* |
| $R_{ij,0}$ | *is the average aggregated sales which is deflated with price deflator for industry **i** of group **j** at time 0 (base period=2015).* |

*The index for the group j is:*

$$I_{jt} = \frac{\sum(W_{ij} I_{ijt})}{\sum W_{ij}}$$

*Where:*

$\mathbf{I}_{jt}$ *refers to the index for group **j** at time **t**;*

$\mathbf{W}_{ij}$ *is the relative share of value added industry I to the total value added group **j**; and*

$\boldsymbol{I}_{ijt}$ *is the aggregated index for industry **I** of group **j** at time t.*

### 8. Price Deflator

*Items of each sub-sector are selected from the basket of goods of Consumer Price Index (CPI) and Producer Price Index (PPI) and the price changes at sub-sector level are measured.*

### 9. Time Base

*The 'index reference period' in which the index is given a value of 100 is the year 2015. The base period for the Volume Index of Wholesale & Retail Trade is revised approximately every 5 years.*

### 10. Index Changes

*Percentage change of the index is calculated based on the following formula:*

$$\mathbf{Y}_t = \frac{\mathbf{I}_t - \mathbf{I}_{t-1}}{\mathbf{I}_{t-1}} \mathbf{X}\ 100$$

*Where:*

$\mathbf{Y}_t$ *refers to index percentage change;*

$\mathbf{I}_t$ *is the index at time **t** (current period); and*

$\mathbf{I}_{t-1}$ *is the index at time **t –1** (previous period).*

### 11. 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 real behaviour of the series would be revealed. The estimation and removal of the seasonal effects is known as **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 are affected by major festivals such as Eid-ul Fitr of the Muslims, Chinese New Year of the Chinese and Deepavali of the Indians. 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).*

***12. Concepts and Definitions***

*The concepts and definitions of Wholesale & Retail Trade adopted in this publication is based on the Manual of International Recommendations for Distributive Trade Statistics (IRDTS) 2008 published by the United Nations Statistics Division.*

***13. An establishment** is defined as "an economic unit that engaged in one activity, under a single legal entity and operating in a single physical location".*

***14. Wholesale Trade** refers to "the resale (sale without transformation) of new and used goods to retailers; to industrial, commercial, institutional or professional users; or to other wholesalers; or involves acting as an agent or broker in buying merchandise for, or selling merchandise to, such persons or companies".*

***15. Retail Trade** refers to "the resale (sale without transformation) of new and used goods to the general public for personal or household consumption or utilization."*

***16. Motor Vehicles** refer to activity of wholesale and retail sale of motor vehicles and motorcycles, either new or used, sale of motor vehicle parts and accessories, maintenance and repair of motor vehicles and motorcycles including washing, polishing and towing as well as commission agents.*

***17. Revision Policy***

- *For monthly data, subject to changes in data source, revision is **t-1** where **t** refers to current month.*
- *For quarterly data, subject to changes in data source, revision is **t-1** where **t** refers to current quarter.*
- *For annual data, subject to changes in data source, revision is **t-3** where **t** refers to current year.*