# APPENDICES

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APPENDIX 1

# Technical Notes

## Methodology for the Malaysian Well-being Index

This technical note serves to explain the technical aspects in computing the Malaysian Well-being Index (MWI). The topics covered include explanations on the data used and its sources; definition and selection process of the components and indicators; the methodology in computing the MWI as well as in calculating the sensitivity of the MWI and its component indices to the changes in the national income over the years.

### Data

Data for all the indicators used in constructing the MWI is based on secondary data that are sourced from various ministries and agencies as well as the private sector. The reference years are from 2000 to 2012. The year 2000 is chosen as the base year as besides being a relatively normal year, it is sufficiently recent. Thus, enables the MWI to capture the performance of the indices over the past decade. As the base year is 2000, the value of the indices for the year 2000 equals 100. In the case where no data is available in between the time series, the data is estimated using the compounded annual growth rate method (CAGR). The CAGR is basically a geometric mean that provides a constant rate of return over a time period. The formula for CAGR is given below:

$$CAGR(t_0, t_n) = \left(V(t_n)/V(t_0)\right)^{\frac{1}{t_n - t_0}} - 1$$

where

$V(t_0)$ = the start value

$V(t_n)$ = the finish value

$t_n - t_0$ = the number of years

The CAGR is useful in detecting the trend and direction of the data. In constructing the MWI, filling in the missing data is important in order to have a smooth index series. Therefore, this fact needs to be taken into consideration by readers when using the data series produced in this report for other purposes.

## Explanation of Components and Indicators

The list of components and their rationales are presented in *Table A.1*. The components are selected to reflect the many dimensions of well-being.

***Table A.1 Components of Well-being***

| NO. | COMPONENTS |
|---|---|
| **1** | **COMMUNICATIONS** |
| | Communications is important because of the economic and social benefits it provides to individuals. Economically, communication is a tool to enhance accessibility to people and resources; thus, promoting efficiency and productivity. The advancement in communications has enabled real time connectivity across the globe hence bringing businesses as well as social relationships even closer. |

| | |
|---|---|
| **2.** | **CULTURE** |
| | Culture has an intrinsic value as a repository of symbols and identity of a nation and significantly contributes to the economic, social and environmental dimensions of development and well-being. Culture is manifested through human behaviour and thought and influences the manner of speech, social and religious practices of a society. Universal Declaration on Cultural Diversity (2001) defined culture as "…the set of distinctive spiritual, material, intellectual and emotional features of society or a social group and that it encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs." Freedom to exercise one's own culture promotes a sense of belonging. |
| **3.** | **EDUCATION** |
| | Education is the principal instrument for transmitting knowledge and culture from one generation to the next. It provides the foundation from which the technology to sustain and improve the quality of life is developed and enhanced. Education is important for individuals not only due to the economic opportunities it offers, but also for personal articulation and societal advancement. For these purposes, the development of the education system should encompass both the equality and the qualitative aspects. |
| **4.** | **ENVIRONMENT** |
| | Environment has a direct effect on the well-being of the population in providing livable conditions and sustainable resources. Livable conditions enhance capability and functionings of individuals in their life. Sustainable resources, in turn, ensure further economic growth that benefits not only the current population but also the future generations. |
| **5.** | **FAMILY** |
| | The family unit represents the core institution within the societal structure and its functioning fulfils the social, economic and psychological needs of individuals. While income provides the platform that allows individuals to sustain themselves and their families, the strength of family units is also influenced by the non-financial factors that may in turn, affect the functionality of family units. |
| **6.** | **GOVERNANCE** |
| | Good governance is a part of institutional factors that support the attainment of individuals' functionings in life. While oppressive institutions are a cost to society, the good ones can have a positive impact on the way individuals convert wealth and opportunities into benefits that they value in their lives. |
| **7.** | **HEALTH** |
| | Health constitutes an integral part of well-being due to its contribution to the functioning of a person. Being physically and mentally healthy will enable individuals to perform their responsibility toward him/herself, family and society as a whole. Health is also directly linked to economic growth by enhancing human capital and productivity. |

| | |
|---|---|
| **8.** | **HOUSING** |
| | Housing is a basic necessity for a decent living, security and shelter for families/individuals. Comfortable living is normally associated with better life performance since it provides peace of mind and promotes life satisfaction. |
| **9.** | **INCOME & DISTRIBUTION** |
| | Income of a nation reflects the capability of the country as a whole in generating wealth for its population. It also represents the size of opportunity for the nation to convert wealth into well-being at the aggregate level. The distribution of income reflects the state of equality and distribution of economic resources. When measured based on household disposable income, income distribution gives a better picture of income disparity among the population. The poverty incidence focuses on income of the bottom group of the population. |
| **10.** | **LEISURE** |
| | Leisure can enhance positive experiences and emotion of individuals. It is an important domain that contributes to subjective well-being as it evokes happiness. Leisure also promotes life enriching and therefore important in maintaining spiritual wellness. |
| **11.** | **PUBLIC SAFETY** |
| | Peace and security are preconditions for human well-being. As such, it is pertinent for a country to uphold public safety at all times to ensure social peace and stability. Freedom to move around without fear is a supporting element for individuals in fulfilling their functionings in life. |
| **12.** | **SOCIAL PARTICIPATION** |
| | Inclusiveness is important for human well-being and can be achieved with social participation. Social participation is the reflection of the people's commitment and willingness to be involved in social, political, religious and community activities. Being able to take part in society is one of the achieved functioning and thus freedom in life. |
| **13.** | **TRANSPORT** |
| | Transport is vital for progress and development since it relates to the mobility and accessibility to resources as well as opportunities for employment, education and movement of goods and services. The capability and functioning of individuals will improve greatly with the ease of transport. |
| **14.** | **WORKING LIFE** |
| | The condition of working life is one of the important elements of an individual's well-being because it promotes both security and peace of mind. Work produces a source of income that increases the capability to improve the standard of living and quality of life. On top of having to work for a living, having a comfortable place to work with less stress and risk promotes a healthy mind that leads to productivity. |

The list of the indicators together with their definitions is presented in *Table A.2* below. Most of the indicators are standardised against population, which is also experiencing an increase over the 12 years. This will better reflect the real changes of the indicators over the years. The sign next to the indicators (+/-) show the relationship with the MWI.

***Table A.2 The MWI Indicators***

| NO. | INDICATORS |
|---|---|
| **1** | **COMMUNICATIONS** |
| | **1. Telephones - fixed line and mobile (per '000 population) (+)**<br>Refers to the number of fixed line and mobile subscriptions for every 1,000 population.<br><br>**2. Internet subscribers (per '000 population) (+)**<br>Refers to the number of internet and broadband subscribers for every 1,000 population, including satellite, fixed wireless, VDSL, fiber, WiMax, Unifi, Iburst, EV-DO and Danawa.<br><br>**3. Number of hotspot locations (+)**<br>Refers to the number of hotspot by location including 1Malaysia Community Broadband Centres (CBC), *Kampung Tanpa Wayar 1Malaysia (KTW1M),* Mini CBC and 1Malaysia Community Broadband Libraries (CBL).<br><br>**4. Number of domain name (per '000 population) (+)**<br>Refers to the number of Domain Names Subscriptions under My Domain Registry for every 1,000 population. |
| **2.** | **CULTURE** |
| | **1. Membership in public libraries (per `000 population) (+)**<br>Refers to the number of membership registered in 16 state public libraries in the country including the Federal Territory of Kuala Lumpur, Labuan and Putrajaya for every 1,000 population.<br><br>**2. Number of *Istana Budaya* visitors (per '000 population) (+)**<br>Refers to the number of attendees that comes over for entertainment shows held at the *Istana Budaya* for every 1,000 population.<br><br>**3. Number of museum visitors (per '000 population) (+)**<br>Refers to the number of visitors to museums under the Department of Museums Malaysia for every 1,000 population.<br><br>**4. Number of *Kompleks Kraf* visitors (per '000 population) (+)**<br>Refers to the number of visitors to *Kompleks Kraf* under the Malaysian Handicraft Development Corporation for every 1,000 population. |

## 3. EDUCATION

**1. Pre-school participation rate (+)**
Refers to the percentage of enrolment of the eligible official pre-school age population (4+ and 5+) in a given school year.

**2. Primary school participation rate (+)**
Refers to the percentage of enrolment of the eligible official primary school age population (6+ to 11+) in a given school year.

**3. Secondary school participation rate (+)**
Refers to the percentage of enrolment of the eligible official secondary school age population (12+ to 16+) in a given school year.

**4. Tertiary participation rate (+)**
Refers to the percentage of enrolment of the tertiary (post-secondary) age-cohort population (17-23+) in a given school year.

**5. Literacy rate (+)**
Refers to the percentage of population that had the ability to read and write with ability to understand a short simple statement on everyday life.

**6. Percentage of graduate teachers in primary schools (+)**
Refers to the percentage of graduate teachers to total number of teachers in primary schools.

**7. Percentage of graduate teachers in secondary schools (+)**
Refers to the percentage of graduate teachers to total number of teachers in secondary schools.

**8. National Average Grade (UPSR) (-)**
Refers to the national average grade in *Ujian Penilaian Sekolah Rendah* (UPSR). Data shows that the lower the number the better.

**9. National Average Grade (SPM) (-)**
Refers to the national average grade in *Sijil Pelajaran Malaysia* (SPM). Data shows that the lower the number the better.

**10. Number of lecturers with PhD (+)**
Refers to number of lecturer with Doctor of Philosophy (PhD) qualifications in public and private higher education institutions.

**11. Primary education survival rate (+)**
Survival rate is the estimated proportion of a cohort of pupils who completed the last grade of primary education as a percentage of pupils enrolled in the first grade of a given cycle in a given school year. This indicator is used to show the proportion of pupils from the given cohort who completed a primary education cycle and hence, the degree of success of this education cycle and this cohort of pupils.

**12. Secondary education survival rate (+)**

Survival rate is the estimated proportion of a cohort of pupils who completed the last grade of secondary education as a percentage of pupils enrolled in the first grade of a given cycle in a given school year. This indicator is used to show the proportion of pupils from the given cohort who completed a secondary education cycle and hence, the degree of success of this education cycle and this cohort of pupils.

## 4. ENVIRONMENT

**1. Air quality (% of station with API<50) (+)**

Refers to the percentage of stations that recorded air pollution index (API) less than 50.

**2. Water quality (% of clean river monitored) (+)**

Refers to the percentage of monitored rivers that recorded clean water.

**3. Percentage of forested land (+)**

Refers to the percentage of forested land area to total land area in Malaysia.

**4. Quantity of scheduled waste generated (tonnes/year)/population (-)**

Refers to the total quantity of scheduled waste generated by industry and household. Data shows total tonnes of scheduled waste generated for every year.

**5. Maximum mean temperature (˚C) (-)**

Refers to the mean maximum temperature in Malaysia for every year. Data shows the lower the temperature the better.

## 5. FAMILY

**1. Divorce rate (% of population aged 18 and above) (-)**

Refers to the percentage of divorce cases among population aged 18 and above.

**2. Domestic violence cases (per '000 population) (-)**

Refers to number of domestic violence cases reported to *Polis DiRaja Malaysia* (PDRM). Data shows the number of domestic violence cases for every 1,000 population.

**3. Juvenile crimes (% of population age 10 - 18 years) (-)**

Refers to the number of juvenile crime cases among population aged 10 to 18 years reported to PDRM.

**4. Mean monthly household income (+)**

Refers to the average household income per month based on gross income.

**5. Household debt per capita (RM) (-)**

Refers to the individual outstanding debt including mortgage financing, car financing, personal financing and other financing from banking institutions, development financial institutions, insurance sector, selected non-bank financial institutions and the Treasury Housing Loan Division.

**6. Dependency ratio (-)**
Refers to the ratio of the number of persons below the age of 15 years and the number of persons aged 65 years and above to the number of persons aged 15 - 64 years.

## 6. GOVERNANCE

**1. Percentage of corruption cases prosecuted (+)**
Refers to the percentage of corruption cases prosecuted to total number of arrests made by the Malaysian Anti-Corruption Commission (MACC).

**2. Number of e-payment transactions (+)**
Refers to the number of e-payment transactions made in the banking system including credit card, charge card, debit card, electronic money, single purpose payment cards, *Sistem GIRO Antara Bank*, Direct Debit, ATM (not including money withdrawal), internet banking, mobile banking and third party transactions through Real Time Electronics Transfer of Funds and Securities (RENTAS).

**3. Percentage of cases solved by ( *Biro Pengaduan Awam* ) (+)**
Refers to the percentage of cases solved by *Biro Pengaduan Awam*. By definition, public complaints mean "complaints made by the public on their dissatisfaction towards any administrative action (include those made by Government agencies that have been privatised or institutions that have a monopoly and those that provide public amenities) that are considered as unjust, not in accordance with the existing laws and regulations, abuse of power, maladministration and other similar acts by Government agencies".

**4. Percentage of e-Filing users (+)**
Refers to an application on filling and filing Income Tax Return Forms (ITRF) done electronically based on several forms such as Form B/BT (e-B/e-BT), Form BE (e-BE), Form P (e-P), Form M/MT (e-M/e-MT), Form E (e-E), Form C (e-C), Form R (e-R) and e-Estimated (e-CP204) for company/co-operative society/trust body. Currently users have an option to file the forms electronically or manually.

## 7. HEALTH

**1. Life expectancy at birth (+)**
Refers to the average number of years a person can expect to live.

**2. Infant mortality rate (per 1,000 live births) (-)**
Refers to the number of deaths of infants aged less than 1 year old in a given year per 1,000 live births in the same year.

**3. Maternal mortality rate (per 100,000 live births) (-)**
Refers to the number of female deaths in a given year, which are caused by complications during pregnancy, childbirth and within the period of six weeks or 42 days after childbirth (puerperium) per 100,000 live births.

**4. Number of non-communicable disease cases (per '000 population) (-)**

The non-communicable diseases refer to diseases which are not transmissible, or known as chronic diseases, that are not passed from person to person. The four main types of non-communicable diseases are cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. Data used for the index calculation is the number of hospital discharges related with non-communicable disease cases in all Ministry of Health hospitals.

**5. Number of beds in hospitals (per '000 population) (+)**

Refers to the number of inpatient beds in public and private hospitals that includes acute and chronic beds for every 1,000 population.

**6. Doctor to population ratio (-)**

Refers to one doctor for an estimated number of people served in a given year. Doctor refers to a medical practitioner who is registered with the Malaysian Medical Council, includes house officer.

**7. Hospital waiting time for out-patients (minute) (-)**

Refers to time taken from patient registration until the patient is seen by a medical personnel.

## 8. HOUSING

**1. Percentage of low cost housing units to bottom 40% (+)**

Refers to the percentage of low-cost housing units to the bottom 40% households.

**2. Percentage of households with treated water (+)**

Refers to the percentage of households supplied with treated water facilities.

**3. Percentage of households with electricity (+)**

Refers to the percentage of households supplied with electricity facilities.

**4. % of households with garbage collection services (+)**

Refers to the percentage of housing with garbage collection coverage.

**5. Crowdedness (-)**

Indicates whether the persons occupying a dwelling are living in crowded conditions. It is measured as the number of persons living in a dwelling divided by the number of rooms in a dwelling.

## 9. INCOME & DISTRIBUTION

**1. Real per capita income GNP (+)**

Gross National product (GNP) is the total value of all final goods and services produced within a nation in a particular year, plus income earned by its citizens (including income of those located abroad), minus income of non-residents located in that country. GNP per capita (RM) refers to GNP divided by population in Malaysia.

**2. Gini coefficient based on disposable income (-)**

Disposable income refers to a household income less current transfers i.e. mandatory (e.g. income tax, zakat, road tax and EPF contributions); and voluntary fee (e.g. donation to charity and club or association fees).The Gini coefficient is one of the standard tools to measure inequality in income distribution of a given population.

**3. Incidence of poverty (-)**

Refers to the percentage of poor households as compared to total households. Poverty in Malaysia is measured based on Poverty Line Income (PLI). For instance a household is considered poor in 2012 if the household monthly income is less than RM830 in Peninsular Malaysia.

## 10. LEISURE

**1. Number of households with paid TV subscription ('000) (+)**

Refers to the number of households with paid TV (ASTRO and IPTV) subscription.

**2. Domestic hotel guests (per '000 population) (+)**

Refers to the number of domestic hotel guests for every 1,000 population.

**3. Recreational parks visitors (per '000 population) (+)**

Refers to the number of visitors to recreational parks and outdoor activities. Data shows the number of visitors for every 1,000 population.

**4. Cinema goers (per '000 population) (+)**

Refers to the number of cinema goers in Malaysia for every 1,000 population. The data is based on ticket sales.

## 11. PUBLIC SAFETY

**1. Crime rate (per '000 population) (-)**

Refers to the percentage of street crime, property crime and violent crime reported to PDRM. Data shows the number of crimes for every 1,000 population.

**2. Road accidents (per '000 vehicles) (-)**

Refers to the number of road accidents reported to PDRM. Data shows the number of road accidents for every 1,000 registered vehicles.

## 12. SOCIAL PARTICIPATION

**1. Registered voters (% of population aged 21 years and above) (+)**

Refers to the percentage of population aged 21 years and above registered as voters.

**2. Number of registered non-profit organisations (per '000 population) (+)**

Refers to the number of registered non-profit organisation under Societies Act 1966 for every 1,000 population.

**3. Number of registered residents' associations (+)**

Refers to the number of registered residents' associations. Data covers resident associations that are registered with the local authorities.

**4. Membership in RELA & *RakanCop* (per '000 population) (+)**

Refers to the number of membership in *Ikatan Relawan Rakyat Malaysia* (RELA) and *RakanCop*. RELA was established on 11 January 1972 to enable the masses to volunteer in preserving and maintaining national peace and security. *RakanCop* is a police community programme launched in 2005 to help prevent crimes in Malaysia. The main objective is to provide more opportunity to the society to cooperate with the police and be directly involved in crime prevention.

## 13. TRANSPORT

**1. Private motorcars & motorcycles (per '000 population) (+)**

Refers to the number of registered private motorcars and motorcycles for every 1,000 population.

**2. Road Development Index (+)**

Road Development Index (RDI) is an indicator of the quality of road development taking into account the length of the road network, land area and population. Generally, if RDI> 1, it shows the level of the road network is good as well as be able to accommodate the current traffic demand while generating socio-economic activities. Higher RDI values reflect a more sustainable development of road.

**3. Road length per capita (+)**

Refers to the total length of paved and unpaved road (km) divided by total population.

**4. Rail ridership (million) (+)**

Refers to the ridership of rail services that include LRT (Ampang and Putra Lines), KL Monorail, KLIA Express Transit, KTM Commuter and intercity trains.

## 14. WORKING LIFE

**1. Trade disputes (-)**

Refers to the number of disputes filed between the employer and his workmen on issues relating to employment or non-employment or terms and conditions of employment or conditions of work.

**2. Man-days lost due to industrial action ('000) (-)**

Refers to the number of total working days lost to-date or within a period (usually one year) due to reasons such as accidents, lockouts or strikes.

**3. Industrial accidents (-)**
Refers to the number of fatalities, permanent disablement and temporary disablement due to workplace accidents and occupational disease.

**4. Average working hours (-)**
Refers to the average weekly hours of work among employed persons. Data refers to total working hours divided with total number of employment. Standard working hours of countries worldwide are around 40 to 44 hours per week.

## Selection of Indicators

The appropriateness of the indicators according to the proposed components is tested using factor analysis (FA) method. In principle, FA attempts to identify the underlying variables or factors that explain the pattern of correlations within a set of observed variables. In the case of constructing the MWI, the underlying variables are the components and the observed variables are the indicators. The component is regarded as underlying or unobserved because there is no direct variable that can proxy it. The health component for instance has no direct measure but can be proxied by the health status of certain segments of the population such as infant mortality ratio or the seriousness of the non-communicable diseases among the population like cardiovascular related illness, diabetes and high blood pressure. The FA is often used in data reduction to identify a small number of factors that explain most of the variance that is recorded in a much larger number of observed variables.

In working with the indicators for the MWI, almost all the indicators proposed to be under the components are suitable. *Table A.3* shows that all the components registered an eigenvalue greater than one, indicating suitability of the factor proposed.

***Table 4.4: Elasticity of the Component and Sub-component Indices to GDP***

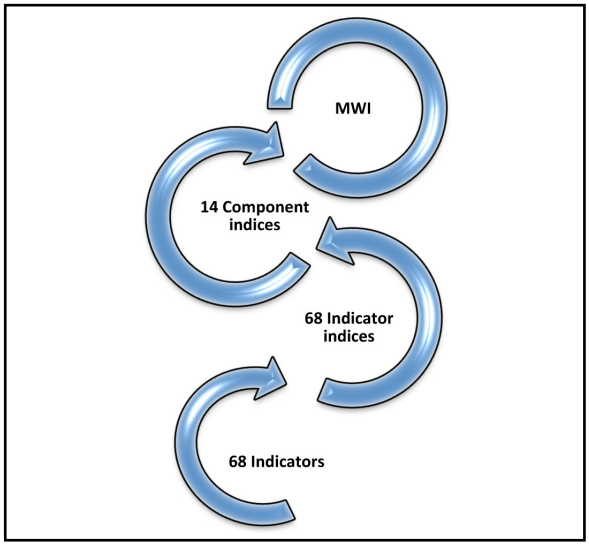
| No. | Components | Indicators | Eigenvalue |
|---|---|---|---|
| 1. | Income and distribution | 3 variables | 2.68587 |
| 2. | Working life | 4 variables | 2.36523 |
| 3. | Transport | 3 variables | 2.13902 |
| 4. | Communications | 4 variables | 3.63015 |
| 5. | Health | i. Level of health<br>5 variables<br>ii. Healthcare service<br>3 variables | 2.38261<br><br><br>1.92239 |

| | | | |
|---|---|---|---|
| 6. | **Education** | i. Equality<br>4 variables<br>ii. Quality<br>8 variables | <br>2.87476<br><br>6.82465 |
| 7. | **Housing** | 5 variables | 4.12964 |
| 8. | **Environment** | 5 variables | 2.66238 |
| 9. | **Family** | i. Institution<br>3 variables<br>ii. Financial health<br>3 variables | <br>2.16292<br><br>2.93706 |
| 10. | **Social participation** | 4 variables | 2.78544 |
| 11. | **Public safety** | 2 variables | 0.83211 |
| 12. | **Culture** | 4 variables | 3.51694 |
| 13. | **Leisure** | 4 variables | 2.92472 |
| 14. | **Governance** | 3 variables | 1.90675 |

## Index Calculation

The MWI is calculated as a composite index based on the average of 14 component indices, while each of the component-index is calculated from the average of indicator indices under the respective components. The relationship of the composite index and the indices is as shown in *Figure A.1*. All the indicators are assigned a positive or a negative sign. The indicators with positive signs (e.g. life expectancy, real per capita GNP) imply that an increase in the numerical value denote improving conditions while those with a negative sign (e.g. infant mortality rate, poverty rate) denote the reverse. The correction of the trend direction is carried out on the indicators with negative signs so that all upward trends show an improvement in well-being, while downward trends indicate otherwise. This is necessary to have a common reading of the trend directions of the various indices, including the composite index.

*Figure A.1 Relationship between the Composite Index and the Indices*




The data has to be standardised to enable the indices to be comparable. In doing so, it also removes the different units of measurement of all indicators to come up with a common reading for all the indicators that is amenable to aggregation for the derivation of the composite index and the component indices. Standard deviation method is used to standardise each indicator. The standard deviation will enabled more accurate determination of the values of a frequency distribution in relation to the mean. According to Chebsyev's theorem, no matter what the shape of the distribution is, at least 75 per cent of the values will fall within + 2 standard deviations from the mean of the distribution and at least 89 per cent of the values will lie within + 3 standard deviations from the mean.

The construction of the MWI involves a four-step process. The first step is to obtain the standard score for each indicator; step two to obtain the index score for the indicator; step three to derive the component indices; and step four to aggregate the component indices into a composite index.

## STEP 1: Obtain the Standard Score of each Indicator in Year$_t$

### i) Standard Deviation

The standard deviation is a statistic that reflects the dispersion of the indicator's values around the mean in a set of data. When the values are closely clustered together, the standard deviation is small. When the values are spread apart, the standard deviation is relatively large. The formula for standard deviation (σ) for indicator j is given as:

$$\sigma_j = \sqrt{\frac{1}{N}\sum_{t=1}^{N}\left(x_{jt} - \mu_j\right)^2}$$

where:
σj = the standard deviation of indicator j
N = the number of observation
$x_{jt}$ = the indicator j value at time t
$\mu_j$ = the mean value of indicator j

### ii) Standard Score of Indicator

The standard score expresses an observation in terms of standard deviation units above or below the mean, that is, the transformation of an observation by subtracting the mean and dividing by the standard deviation. The calculations are as given below:

$$Z = \frac{x_{jt} - \mu_j}{\sigma}$$

where:
$x_{jt}$ = the indicator $_j$ *value* at time *t*
μ = the mean value of indicator
σ = the standard deviation of data series
z = the standard score

Example: Standard score of real per capita income (GNP) in 2005 with the mean of 20,340.4 and standard deviation of 2,201.6 will be -0.2

$$Z = \frac{x\ (2005) - \mu}{\sigma}$$

$$= \frac{19{,}950.6 - 20{,}340.4}{2{,}201.6}$$

$$= -0.2$$

## STEP 2: Obtain the Sub-Index for Each Indicator in ($I_{tj}$)

The index of each indicator for each year ($I_{tj}$) is then obtained by multiplying the standard score by 10, and adding 100, as shown below. However, this applies to the positive indicators such as per capita income or school participation rate where an increase in the numerical value indicates an improvement in conditions.

### Index of a positive Indicator

$I_{tj}^{+} = 100 + (z*10)$

Where *t* refers to year and *j* is the indicator

Example: Index of real per capita income (GNP) in 2005

= 100 + (-0.2 * 10)
= 98.2

### Index of a negative Indicator

$I_{tj}^{-} = 100 - (z*10)$

Example: Index of incidence of poverty in 2005

= 100 - (0.2*10)
= 97.9

The trend for negative indicators was corrected in order to have a consistent reading of the indices by subtracting the left term by 100 instead of adding 100. Examples of these indicators are poverty incidence, infant mortality rate and unemployment rate, where an increase in the numerical value indicates deterioration in conditions.

### Index with base-value 2000

Once this step is completed, to have an index value that can be compared to the initial year or the base value, the score is then divided by the base value. The value for the year 2000 will always be 100.

$I_{2005j} = (I_{tj}^{+/-} / I_{2000j})*100$

Continues with the example for real per capita income above:

= (98.2/85.2)*100
= 115.4

In this example, the index of real per capita income in year 2005 recorded an improvement of 15.4 points compared with the year 2000.

## STEP 3: Obtain the Index of Each Component in Year$_t$

The index of each component is then obtained by averaging the value of indicator indices with base value 2000 for the respective component as follows:

$$I_c = \frac{1}{N}\sum_{j=1} I_{tj}$$

where:
$I_c$ = the component index
N = the number of indicators
$I_{tj}$ = the index indicator j with base-value 2000 for year$_t$

Example: Income and Distribution Component Index in 2005

$$= \frac{\left[\begin{array}{l}\text{Real per capita income index} + \\ \text{Gini coefficient index} + \\ \text{Incidence of poverty index} +\end{array}\right]}{n}$$

$$= \frac{(115.4 + 96.4 + 119.1)}{3}$$

$$= 110.3$$

## STEP 4: Obtain the Composite Index in Year$_i$

Finally, the Composite Index is derived by averaging the component indices

$$MWI = \frac{1}{N}\sum_{c=1} I_c$$

where:
MWI = the composite index
$I_c$ = the component indices
N = the number of components

Example: Malaysian Well-being Index in 2005 with 14 components

$$= \frac{\begin{array}{l}\text{Income and Distribution Index} + \text{Working Life Index} + \text{Transport Index} + \\ \text{Communications Index} + \text{Health Index} + \text{Education Index} + \\ \text{Housing Index} + \text{Environment Index} + \text{Family Index} + \\ \text{Social Participation Index} + \text{Public Safety Index} + \text{Culture Index} + \\ \text{Leisure Index} + \text{Governance Index}\end{array}}{14}$$

$$= \frac{\left[\begin{array}{lll}110.3 + 105.2 + 112.5 + \\ 106.5 + 101.0 + 118.0 + \\ 123.0 + 106.6 + 104.7 + \\ 93.9 + 110.8 + 102.5 + \\ 115.9 + 110.2\end{array}\right]}{14}$$

$$= 108.7$$

## Translating Economic Growth Into Well-being

Conceptually, the relationship between economic growth and well-being can be evaluated from two perspectives. One is from the direction of growth to well-being; and two, is from well-being to growth. In analysing the relationship of the two variables, this report dwells on the first perspective on the simple basis that for a developing country, the country needs to have an economic growth before income can be channelled to improve the well-being of the population. To achieve the objective, two methods of analysis are applied and there are correlation coefficients between the indices and elasticity of the indices to the changes in income.

### Correlation Coefficient

*Correlation* measures the strength of the relationship between two random variables. The degree of correlation is measured by correlation coefficients. For the purpose of this report, Pearson Correlation coefficient, which is sensitive only to a linear relationship between two variables are used. The correlation coefficient of two random variables X and Y is represented by either

$$r(X, Y) \text{ or } \rho(X, Y)$$

The representation of $r(X, Y)$ is utilised for correlation of sample data while $\rho(X, Y)$ is employed for correlation of population data where $\rho$ denotes the Greek letter rho.

$$\rho(X,Y) = \frac{Cov(X,Y)}{\sqrt{Var(X)Var(Y)}} = \frac{Cov(X,Y)}{\sigma_x \sigma_y}$$

Cov(X,Y) is covariance, which measures the strength of the correlation between the random variables. When Cov(X, Y) = 0, $\rho(X, Y) = 0$, the variables are uncorrelated. When the covariance is non-zero, the variables are correlated in some way depending on the value of the covariance. If Cov(X,Y) > 0, variable Y increases as X increases, while if Cov(X,Y) < 0, variable Y decreases as X increases. Covariance is calculated as

$$Cov(X,Y) = \sum_{i=1}^{N} \frac{(x_i - x)(y_i - y)}{N}$$

The covariance is then divided by the product of the variables' standard deviation to derive correlation. The Pearson's Correlation coefficient takes on values between -1 and +1 with the following interpretations:

- ρ(X, Y) = -1 indicates perfect decreasing (negative) linear relationship (anti-correlation)
- -1 < ρ(X, Y) < + 1 indicates the degree of linear dependence between variables (the closer the coefficient to either +1 or -1, the stronger the correlation between the variables).
- ρ(X, Y) = + 1 indicates perfect increasing (positive) linear relationship.
- ρ(X, Y) = 0 indicates that the variables are independent ONLY when X and Y are jointly normal[18].

For the purpose of this report, the relationships between GDP and the indices are assumed to be linear. The t-test is used to establish if the correlation coefficient is significantly different from zero, showing evidence of an association between GDP and the indices.

[18] *If the variables are independent, Pearson's Correlation coefficient is 0, but the converse is not necessarily true because the correlation coefficient detects only linear dependencies between two variables.*

## Measure of Elasticity

*Elasticity* in the economic term is defined as the responsiveness of a dependent economic variable to changes in influencing factors[19]. In other words it measures the magnitude of change in a variable in response to changes of another variable. Normally, the empirical work on elasticity concerns with estimating coefficient in a linear regression equation. In this framework both variables are transformed into natural logs. The advantage of elasticity is that it is independent of units and thus simplifies data analysis. In the analysis of MWI, elasticity is used to determine the sensitivity of the indices in response to the changes in income. The equation for that purpose is given below:

$$ln(Y)=\beta_0 + \beta_1 * ln(X) + \mu$$

From the regression equation above, Y represents the MWI while X is the GDP at current price. $\beta_1$ is the elasticity of MWI with respect to changes in GDP. The value of the coefficient $\beta_1$ can be interpreted as the percentage change in MWI in association to a one per cent change in GDP. Perfect elasticity is obtained when a one percentage point change in the GDP results into a one percentage point change in the MWI. In economic terminology, the variable is said to be highly elastic if the coefficient scores higher than one. A positive sign of the coefficient reflect similar directional relationship while a negative sign indicates a reverse movement in Y variable.

[19] *As defined according to Merriam-Webster Dictionary (sourced from http://www.merriam-webster.com/dictionary/elasticity?show=0&t=1372660619 on 1 July 2013)*

APPENDIX 2

# Statistical Tables

(1) MWI Performance by Component, 2000-2012

| Component | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Economic Well-being** | **100.0** | **101.5** | **102.7** | **106.1** | **108.7** | **110.5** | **114.3** | **119.0** | **120.0** | **121.1** | **124.2** | **128.5** | **133.3** |
| Transport | 100.0 | 102.7 | 103.6 | 105.9 | 108.8 | 112.5 | 114.5 | 118.5 | 119.6 | 123.3 | 126.3 | 131.4 | 136.9 |
| Communications | 100.0 | 101.3 | 102.2 | 103.5 | 105.4 | 106.5 | 107.4 | 109.6 | 112.7 | 115.4 | 120.6 | 127.4 | 136.2 |
| Education | 100.0 | 102.5 | 103.7 | 108.7 | 114.1 | 118.0 | 117.8 | 122.1 | 123.8 | 125.8 | 128.6 | 129.5 | 132.9 |
| Income and Distribution | 100.0 | 99.3 | 100.9 | 102.8 | 104.7 | 110.3 | 116.0 | 121.5 | 121.2 | 119.9 | 124.2 | 128.4 | 131.8 |
| Working Life | 100.0 | 101.9 | 103.1 | 109.7 | 110.5 | 105.2 | 115.8 | 123.4 | 122.8 | 120.8 | 121.5 | 125.7 | 128.6 |
| **Social Well-being** | **100.0** | **102.2** | **104.7** | **105.0** | **106.5** | **107.6** | **108.5** | **110.7** | **112.0** | **113.3** | **117.2** | **118.9** | **121.0** |
| Housing | 100.0 | 109.0 | 118.5 | 119.4 | 120.7 | 123.0 | 125.0 | 126.6 | 131.8 | 136.8 | 137.0 | 137.0 | 136.9 |
| Leisure | 100.0 | 102.2 | 102.3 | 105.6 | 111.7 | 115.9 | 117.2 | 120.5 | 124.9 | 122.2 | 126.1 | 127.9 | 131.4 |
| Governance | 100.0 | 102.2 | 111.6 | 107.4 | 107.2 | 110.2 | 114.0 | 115.7 | 117.4 | 119.8 | 122.6 | 121.9 | 128.1 |
| Public Safety | 100.0 | 101.3 | 105.0 | 102.9 | 102.6 | 110.8 | 105.0 | 102.9 | 103.9 | 106.6 | 116.2 | 119.1 | 125.6 |
| Social Participation | 100.0 | 101.3 | 101.2 | 103.0 | 103.8 | 93.9 | 94.4 | 98.1 | 99.2 | 102.3 | 110.6 | 113.6 | 120.6 |
| Culture | 100.0 | 97.2 | 95.7 | 95.1 | 101.0 | 102.5 | 106.6 | 109.2 | 107.2 | 112.8 | 117.6 | 117.4 | 120.3 |
| Health | 100.0 | 100.6 | 98.9 | 100.2 | 100.3 | 101.0 | 104.9 | 106.3 | 108.0 | 108.0 | 110.3 | 113.2 | 114.1 |
| Environment | 100.0 | 104.6 | 105.3 | 108.1 | 106.7 | 106.6 | 104.8 | 111.3 | 110.4 | 106.1 | 106.9 | 109.1 | 107.3 |
| Family | 100.0 | 101.1 | 103.6 | 103.5 | 104.2 | 104.7 | 104.9 | 105.9 | 105.5 | 104.8 | 107.3 | 110.9 | 104.6 |
| **Composite Index** | **100.0** | **101.9** | **104.0** | **105.4** | **107.3** | **108.7** | **110.6** | **113.7** | **114.9** | **116.1** | **119.7** | **122.3** | **125.4** |

(2) Statistical Tables by Components and Indicators

| Transport | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Road Development Index (RDI) (+) | 0.75 | 0.81 | 0.80 | 0.84 | 0.85 | 0.96 | 0.99 | 0.99 | 0.99 | 1.35 | 1.48 | 1.70 | 1.91 |
| Private motorcars & motorcycles (per '000 population) (+) | 404.5 | 423.1 | 441.8 | 463.0 | 488.8 | 517.6 | 542.4 | 567.8 | 596.9 | 621.3 | 648.1 | 679.0 | 714.0 |
| Road length per capita (km) (+) | 0.0029 | 0.0030 | 0.0030 | 0.0031 | 0.0030 | 0.0033 | 0.0034 | 0.0044 | 0.0044 | 0.0048 | 0.0051 | 0.0054 | 0.0062 |
| Rail ridership (million) (+) | 95.9 | 109.3 | 114.7 | 125.3 | 148.1 | 160.2 | 168.8 | 176.5 | 175.6 | 168.8 | 173.6 | 189.1 | 197.3 |

| Communications | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fixed and mobile telephone lines subscriptions (per '000 population) (+) | 421.3 | 508.5 | 564.0 | 631.4 | 750.2 | 921.7 | 899.9 | 1,026.4 | 1,163.7 | 1,229.8 | 1,339.8 | 1,408.5 | 1,600.1 |
| Internet subscriptions (per '000 population) (+) | 7 | 9 | 11 | 14 | 17 | 21 | 34 | 41 | 62 | 93 | 165 | 196 | 219 |
| Number of hotspot locations (+) | - | - | - | - | - | 1,227 | 1,358 | 1,485 | 1,953 | 2,846 | 9,141 | 21,712 | 31,493 |
| Number of domain names (per '000 population) (+) | 4 | 5 | 7 | 9 | 12 | 16 | 20 | 27 | 35 | 41 | 40 | 52 | 80 |

| Education | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pre-school participation rate (+) | 48.4 | 52.9 | 53.4 | 59.0 | 64.8 | 67.4 | 59.5 | 75.2 | 76.0 | 71.5 | 73.0 | 71.3 | 80.5 |
| Primary school participation rate (+) | 95.6 | 95.1 | 94.5 | 95.3 | 95.3 | 96.3 | 95.3 | 96.2 | 95.5 | 95.6 | 96.2 | 95.9 | 96.4 |
| Secondary school participation rate (+) | 86.7 | 85.9 | 86.0 | 86.4 | 87.1 | 87.0 | 89.3 | 87.7 | 89.1 | 90.0 | 89.6 | 89.8 | 90.2 |
| Tertiary participation rate (+) | 11.6 | 21.3 | 23.9 | 24.5 | 25.0 | 24.1 | 26.0 | 27.1 | 28.5 | 30.0 | 32.6 | 30.9 | 31.7 |
| Sub-component: Equality | | | | | | | | | | | | | |
| Literacy rate (+) | 91.6 | 91.9 | 92.1 | 92.6 | 92.8 | 93.0 | 93.6 | 93.6 | 93.8 | 94.2 | 94.4 | 95.2 | 95.2 |
| % of graduate teachers in primary schools (+) | n.a. | n.a. | n.a. | n.a. | 3.2 | 6.1 | 10.5 | 13.8 | 17.8 | 25.0 | 30.8 | 36.5 | 39.8 |
| % of graduate teachers in secondary schools (+) | 61.2 | 65.2 | 70.1 | 74.0 | 80.6 | 82.4 | 85.4 | 87.1 | 87.7 | 88.0 | 91.6 | 91.4 | 93.3 |
| National Average Grade (UPSR) (-) | 2.6 | 2.6 | 2.5 | 2.5 | 2.4 | 2.4 | 2.4 | 2.3 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 |
| National Average Grade (SPM) (-) | 6.1 | 6.1 | 6.1 | 5.9 | 5.7 | 5.6 | 5.7 | 5.6 | 5.5 | 5.3 | 5.2 | 5.0 | 5.1 |
| Number of lecturers with PhD (+) | n.a. | 362 | 767 | 868 | 5,627 | 6,428 | 6,647 | 7,779 | 8,717 | 9,420 | 11,648 | 11,081 | 12,504 |
| Primary education survival rate (+) | 96.9 | 97.0 | 95.8 | 95.7 | 98.3 | 98.1 | 98.6 | 97.4 | 99.1 | 98.8 | 97.2 | 98.7 | 99.1 |
| Secondary education survival rate (+) | 84.8 | 84.1 | 85.5 | 86.6 | 88.1 | 89.7 | 89.1 | 89.8 | 90.0 | 90.1 | 90.6 | 91.4 | 90.0 |
| Sub-component: Quality | | | | | | | | | | | | | |

| Income & Distribution | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Real per capita income (GNP) (RM) (+) | 17,071 | 16,933 | 17,583 | 18,431 | 19,317 | 19,951 | 20,874 | 21,768 | 21,960 | 21,649 | 22,238 | 23,025 | 23,626 |
| Gini coefficient based on disposable income (-) | 0.434 | 0.442 | 0.446 | 0.446 | 0.446 | 0.438 | 0.430 | 0.422 | 0.423 | 0.425 | 0.421 | 0.418 | 0.414 |
| Incidence of poverty (-) | 7.6 | 6.7 | 6.0 | 5.8 | 5.7 | 4.9 | 4.2 | 3.6 | 3.7 | 3.8 | 2.9 | 2.2 | 1.7 |

| Working Life | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trade disputes (-) | 436 | 378 | 432 | 378 | 323 | 381 | 333 | 302 | 267 | 330 | 344 | 311 | 302 |
| Man-days lost due to industrial action ('000) (-) | 3.1 | 6.0 | 1.6 | 0.1 | 3.3 | 4.8 | 0.5 | 0.2 | 0.3 | 1.1 | 0.2 | 0.1 | 0.1 |
| Industrial accidents (-) | 95,006 | 85,926 | 81,810 | 81,003 | 77,742 | 70,690 | 68,008 | 56,339 | 63,167 | 61,161 | 60,405 | 59,042 | 56,992 |
| Average working hours (-) | 47.7 | 47.7 | 48.3 | 48.1 | 47.9 | 48.2 | 48.0 | 47.5 | 47.7 | 47.1 | 47.1 | 46.7 | 46.3 |

| Housing | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % of low-cost housing units to bottom 40% (+) | 34.4 | 34.6 | 35.4 | 37.1 | 39.3 | 40.8 | 41.8 | 42.3 | 42.4 | 42.3 | 42.2 | 41.8 | 41.3 |
| % of households with treated water (+) | 89.9 | 91.4 | 92.9 | 92.7 | 92.5 | 92.4 | 92.2 | 92.1 | 92.5 | 92.9 | 93.2 | 93.6 | 93.9 |
| % of households with electricity (+) | 98.3 | 98.7 | 99.0 | 98.9 | 98.9 | 98.9 | 99.0 | 99.0 | 99.1 | 99.3 | 99.2 | 99.0 | 98.9 |
| % of households with garbage collection services (+) | 69.0 | 69.2 | 69.3 | 69.4 | 69.6 | 70.4 | 71.3 | 72.1 | 74.1 | 76.2 | 76.7 | 77.2 | 77.7 |
| Crowdedness (no. of persons per room) | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | 1.7 | 1.7 | 1.6 | 1.6 | 1.6 | 1.5 | 1.5 |

| Environment | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Air quality (% of station with API<50) (+) | 73.4 | 70.2 | 58.0 | 65.0 | 62.4 | 63.2 | 63.5 | 73.2 | 76.6 | 71.7 | 80.9 | 72.4 | 73.9 |
| Water quality (% of clean river monitored) (+) | 28.3 | 50.0 | 52.5 | 49.2 | 48.3 | 70.0 | 58.5 | 63.4 | 57.7 | 54.9 | 51.4 | 59.3 | 58.3 |
| % of forested land (+) | 56.4 | 56.0 | 61.3 | 59.3 | 59.2 | 55.2 | 55.2 | 55.3 | 55.2 | 55.8 | 56.3 | 56.7 | 57.2 |
| Quantity of scheduled waste generated (tonnes/year) / population) (-) | 0.015 | 0.017 | 0.015 | 0.018 | 0.018 | 0.023 | 0.042 | 0.042 | 0.047 | 0.061 | 0.066 | 0.056 | 0.064 |
| Maximum mean temperature (°C) (-) | 32.8 | 32.8 | 33.5 | 32.3 | 32.4 | 32.9 | 32.0 | 31.4 | 31.3 | 31.7 | 32.0 | 31.7 | 32.2 |

| Family | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Divorce rate (% of population age 18 and above) (-) | 0.11 | 0.11 | 0.12 | 0.12 | 0.13 | 0.14 | 0.15 | 0.15 | 0.16 | 0.20 | 0.20 | 0.18 | 0.18 |
| Domestic violence cases (per '000 population) (-) | 0.19 | 0.18 | 0.17 | 0.17 | 0.16 | 0.15 | 0.15 | 0.14 | 0.14 | 0.13 | 0.11 | 0.11 | 0.12 |
| Juvenile crimes (% of population age 10-18) (-) | 0.09 | 0.08 | 0.06 | 0.08 | 0.07 | 0.08 | 0.09 | 0.09 | 0.10 | 0.11 | 0.10 | 0.07 | 0.16 |
| **Sub-component: Institution** | | | | | | | | | | | | | |
| Mean monthly household income (RM) (+) | 2,640 | 2,819 | 3,011 | 3,128 | 3,249 | 3,389 | 3,534 | 3,686 | 3,852 | 4,025 | 4,327 | 4,651 | 5,000 |
| Household debt per capital (RM) (-) | 7,035 | 8,671 | 9,970 | 11,056 | 12,378 | 13,761 | 14,906 | 15,631 | 16,875 | 18,191 | 20,592 | 23,055 | 25,731 |
| Dependency ratio (-) | 61.4 | 60.4 | 59.1 | 57.6 | 56.2 | 54.7 | 53.1 | 51.7 | 50.2 | 48.9 | 47.8 | 47.0 | 46.4 |
| **Sub-component: Financial health** | | | | | | | | | | | | | |

| Public Safety | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crime rate (per '000 population) (-) | 7.7 | 7.6 | 7.2 | 7.5 | 7.2 | 7.0 | 8.7 | 9.1 | 8.9 | 8.9 | 7.4 | 6.5 | 6.0 |
| Road accidents (per '000 vehicles) (-) | 23.6 | 23.5 | 23.2 | 23.3 | 23.7 | 22.3 | 21.6 | 21.6 | 21.5 | 21.0 | 20.7 | 21.1 | 20.4 |

| Social Participation | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % of registered voters (per population aged 21 years and above) (+) | 76.6 | 76.4 | 74.6 | 74.3 | 71.9 | 69.4 | 67.3 | 69.4 | 67.5 | 66.5 | 68.2 | 70.9 | 73.0 |
| No. of registered non-profit organisations (per '000 population) (+) | 1.4 | 1.4 | 1.5 | 1.5 | 1.6 | 1.2 | 1.3 | 1.3 | 1.4 | 1.5 | 1.5 | 1.5 | 1.7 |
| No. of registered residents' associations (+) | 1,607 | 1,738 | 1,818 | 1,945 | 2,249 | 2,032 | 2,331 | 2,642 | 2,988 | 3,409 | 3,775 | 4,025 | 4,542 |
| Membership in RELA and *RakanCop* (per '000 population) (+) | 12 | 13 | 14 | 14 | 15 | 16 | 17 | 19 | 20 | 34 | 91 | 99 | 103 |

| Governance | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % of corruption cases prosecuted (+) | 37.2 | 36.2 | 69.0 | 51.6 | 35.8 | 42.3 | 46.5 | 37.6 | 34.4 | 35.2 | 40.4 | 32.4 | 49.9 |
| No. of e-payment transactions (million) (+) | 96.6 | 115.2 | 214.4 | 357.6 | 467.2 | 590.4 | 785.1 | 966.6 | 1,960 | 1,168 | 1,230 | 1,431 | 1,629 |
| % of cases solved by Biro Pengaduan Awam (+) | 54.5 | 65.8 | 65.5 | 63.7 | 80.6 | 83.0 | 86.4 | 92.9 | 94.8 | 97.6 | 98.7 | 97.7 | 95.6 |
| % of e-Filing users (+) | - | - | - | - | - | - | 4.5 | 13.8 | 21.5 | 27.9 | 32.4 | 35.3 | 39.0 |

| Culture | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Membership in public libraries (per '000 population) (+) | 112 | 122 | 118 | 123 | 118 | 125 | 124 | 134 | 135 | 147 | 169 | 166 | 193 |
| No. of *Istana Budaya* visitors (per '000 population) (+) | 3.6 | 1.0 | 3.7 | 1.5 | 2.5 | 3.0 | 4.8 | 4.5 | 4.6 | 5.4 | 5.3 | 6.1 | 4.9 |
| No. of museum visitors (per '000 population) (+) | 73.1 | 54.8 | 71.3 | 77.5 | 81.5 | 76.2 | 77.4 | 78.0 | 71.4 | 88.9 | 97.6 | 108.5 | 110.6 |
| No. of *Kompleks Kraf* visitors (+) (per '000 population) | 12.5 | 15.6 | 8.4 | 9.6 | 13.1 | 13.8 | 14.5 | 16.0 | 15.1 | 14.9 | 15.5 | 12.8 | 14.0 |

| Leisure | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. of households with paid TV subscriptions ('000) (+) | 1,551 | 1,658 | 1,772 | 1,895 | 2,026 | 2,166 | 2,315 | 2,475 | 2,646 | 2,930 | 3,193 | 3,248 | 3,836 |
| Domestic hotel guests (per '000 population) (+) | 579 | 648 | 671 | 732 | 1,088 | 1,149 | 1,202 | 1,340 | 1,473 | 1,172 | 963 | 958 | 1,019 |
| Recreational parks visitors (per '000 population) (+) | 137 | 183 | 161 | 244 | 295 | 365 | 356 | 362 | 386 | 363 | 549 | 596 | 640 |
| Cinema goers (per '000 population) (+) | 439 | 461 | 417 | 512 | 653 | 995 | 1,043 | 1,240 | 1,591 | 1,571 | 1,899 | 2,054 | 1,940 |

| Health | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Life expectancy at birth (+) | 72.2 | 72.8 | 72.9 | 73.1 | 73.3 | 73.6 | 73.7 | 73.8 | 73.9 | 73.9 | 74.1 | 74.4 | 74.6 |
| Non-communicable disease cases (per '000 population) (-) | 7.2 | 7.6 | 7.9 | 8.0 | 8.4 | 8.6 | 8.9 | 8.9 | 8.9 | 8.7 | 8.2 | 8.3 | 8.4 |
| Infant mortality rate (per 1,000 live births) | 6.5 | 5.7 | 6.5 | 6.6 | 6.5 | 6.6 | 6.2 | 6.2 | 6.2 | 6.9 | 6.8 | 6.6 | 6.6 |
| Maternal mortality rate (per 100,000 live births) (-) | 30.6 | 38.6 | 32.8 | 28.5 | 27.2 | 27.8 | 27.5 | 29.0 | 28.9 | 27.0 | 27.3 | 25.5 | 25.8 |
| **Sub-component: Level of health** | | | | | | | | | | | | | |
| No. of beds in hospitals (per '000 population) (+) | 2.0 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| Doctor to population ratio (-) | 1,490 | 1,474 | 1,406 | 1,377 | 1,402 | 1,300 | 1,214 | 1,149 | 1,105 | 927 | 859 | 791 | 758 |
| Hospital waiting time for out-patients (minute) (-) | 108 | 98 | 89 | 81 | 74 | 67 | 61 | 56 | 51 | 46 | 41 | 37 | 34 |
| **Sub-component: Healthcare services** | | | | | | | | | | | | | |

*Notes:*

Sign (+) means the higher the number the better the performance

Sign (-) means the lower the number the better the performance

APPENDIX 3

# Glossary of Acronyms

| | |
|---|---|
| **1** | |
| 10MP | Tenth Malaysia Plan |
| **3** | |
| 3R | Reduce, Reuse, Recycle |
| **9** | |
| 9MP | Ninth Malaysia Plan |
| **A** | |
| AIGDC | Academia-Industry Graduate Development Centre |
| API | Air Pollution Index |
| ASEAN | Association of South East Asian Nations |
| ASTRO | All-Asian Satellite Television and Radio Operator |
| **B** | |
| BBGP | Broadband for General Population |
| BET | Bus Express Transit |
| BPA | *Biro Pengaduan Awam* |
| **C** | |
| CBC | 1Malaysia Community Broadband Centres |
| CBL | 1Malaysia Community Broadband Library |
| **D** | |
| DCR | Dropped Call Rate |
| **E** | |
| EAF | Employability Attributes Framework |
| EPF | Employees Provident Fund |
| EIU | Economist Inteligence Unit |
| EPP | Entry Point Project |
| EPU | Economic Planning Unit |
| EU | European Union |
| **F** | |
| FA | Factor Analysis |
| FELCRA | Federal Land Consolidation and Rehabilitation Authority |
| FELDA | Federal Land Development Authority |
| FWB | National Family Well-Being (semak) |
| **G** | |
| GCIO | Government Chief Information Officer |
| GDP | Gross Domestic Product |
| GE | Graduate Employability |
| GEB | National Graduate Employability Blueprint |
| GEC | Graduate Employability Competencies |
| GET | Graduate Employability Taskforce |
| GNI | Gross National Income |
| GNP | Gross National Product |
| **H** | |
| HDI | Human Development Index |
| HDR | Human Development Reports |
| HSBB | High-Speed Broadband |
| **I** | |
| IHL | Institutions of higher learning |
| IPTV | Internet Protocol Television |
| ITRF | Income Tax Return Forms |
| **K** | |
| KEJORA | *Lembaga Kemajuan Johor Tenggara* |
| KESEDAR | *Lembaga Kemajuan Kelantan Selatan* |
| KETENGAH | *Lembaga Kemajuan Terengganu Tengah* |
| KLIA | Kuala Lumpur International Airport |

| | |
|---|---|
| KPI | Key Performance Indicator |
| KTM | *Keretapi Tanah Melayu* |
| KTW1M | *Kampung Tanpa Wayar 1Malaysia* |
| KSSM | *Kurrikulum Standard Sekolah Menengah* |
| KSSR | *Kurrikulum Standard Sekolah Rendah* |

**L**

| | |
|---|---|
| LPPKN | *Lembaga Penduduk dan Pembangunan Keluarga Negara* |
| LRT | Light Rail Transit |

**M**

| | |
|---|---|
| MACC | Malaysian Anti-Corruption Commission |
| MAMPU | Malaysian Administrative Modernisation and Management Planning Unit |
| MC&I | Developed Malaysia Criteria and Indicators |
| MCMC | Malaysian Communications and Multimedia Commission |
| MDG | Millennium Development Goals |
| MIROS | Malaysian Institute of Road Safety and Research |
| MOE | Ministry of Education |
| MQLI | Malaysian Quality of Life Index |
| MRA | Minimum Retirement Age |
| MWI | Malaysian Well-being Index |
| MWR | Malaysian Well-being Report |
| MyEG | Malaysia e-Government |
| MYI | Malaysian Youth Index |

**N**

| | |
|---|---|
| NAG | National Average Gred |
| NBP | National Broadband Plan |
| NDP | National Development Policy |
| NEP | New Economic Policy |
| NFP | National Family Policy |
| NPO | Non-Profit Organisation |
| NHMS | National Health and Mobility Survey |
| NKRA | National Key Results Area |
| NKEA | National Key Economic Areas |
| NVP | National Vision Policy |

**O**

| | |
|---|---|
| OECD | Organisation for Economic Co-Operation & Development |
| OSH | Occupational Safety and Health |

**P**

| | |
|---|---|
| PCN | Putrajaya Campus Network |
| PEMANDU | Performance Management & Delivery Unit |
| PHE | Private Higher Education |
| PISA | Programme for International Student Assessment |
| PLI | National Poverty Line Income |
| PPA1M | *Perumahan Penjawat Awam 1Malaysia* |
| PR1MA | *Perumahan Rakyat 1Malaysia* |
| PTPTN | National Higher Education Fund Corporation |
| PDRM | *Polis DiRaja Malaysia* |

**Q**

| | |
|---|---|
| QOL | Quality of Life Index |
| QOS | Quality of Service |

**R**

| | |
|---|---|
| RDI | Road Development Index |
| RELA | *Ikatan Relawan Rakyat Malaysia* |
| RSPO | Roundtable on Sustainable Palm Oil |
| RUMAWIP | *Rumah Mampu Milik Wilayah Persekutuan* |
| RENTAS | Real Time Electronic Transfer of Funds and Securities System |

**S**

| | |
|---|---|
| SCP | Sustainable Consumption and Production |

| | |
|---|---|
| SEDC | State Economic Development Agencies |
| SKPG I | *Sistem Kajian Pengesanan Graduan I* |
| SKPG II | *Sistem Kajian Pengesanan Graduan II* |
| SOCSO | Social Security Organisation |
| SPM | *Sijil Pelajaran Malaysia* |
| SPNB | *Syarikat Perumahan Negara Berhad* |

**T**

| | |
|---|---|
| TIMSS | International Mathematics and Science Study |

**U**

| | |
|---|---|
| UN | United Nations |
| UDA | Urban Development Authority |
| UNDP | United Nations Development Programme |
| UPSR | *Ujian Penilaian Sekolah Rendah* |
| USA | United States of America |