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**A THEORETICAL REVIEW OF INDICATORS FOR MEASURING**  
**COMPETITIVENESS AMONGS STATES IN MALAYSIA**

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*Abstract*

As with many developing countries in the world, Malaysia aimed to achieve the status of a high-income nation. Among the steps taken and continues to be the focus is the efforts to attract foreign investors which depend much on the competitiveness of the Malaysian economy. Many studies have been conducted to assess the level of competitiveness of Malaysia as a country in comparison with other countries. However, within the country itself, the level of competitiveness between the states varies. States also compete to attract investment both from the local as well as foreign investors. In view of this, this paper develops a tool to access the level of competitiveness of the states in Malaysia. Given that the concept of competitiveness is complex and multidimensional, the main challenge of this study is to determine the tools and indicators that can be used to measure competitiveness and then to rank it accordingly. The index of competitiveness developed shall complement the competitiveness index developed by the Economic Planning Unit (EPU) namely the Malaysia Quality of Life Index (MQLI) as well as the Malaysian Urban-Rural National Indicators Network for Sustainable Development (MURNInets) by PLANMalaysia (Department of Urban and Rural Planning). Thus, the competitiveness index can be described as a measurement that provides a summary of informative information regarding specific issue. This paper serves as a review of the theoretical framework of indicators used to measure the competitiveness based on past studies that have been conducted in this area in comparison with MQLI and MURNInets.

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**Keywords:** Competitiveness, Indicators, Quality of Life Index (MQLI), Malaysian Urban-Rural National Indicators Network for Sustainable Development (MURNInets), Theoretical Framework.



## **1. Introduction**

Over the years, many studies have been initiated to develop and create a set of indicators to measure city competitiveness. Several sets of indicators have been identified to evaluate the quality of life and competitiveness of cities or regions. Malaysia has no exception to this. In Malaysia, some government agencies have attempted to devise this competitiveness index based on certain organizational mission and objectives. The driving force behind these attempts is measure the quality of life of the public. Quality of life in a societal context is related to the concept of liveability of society in a city. It is affected by the infrastructure, physical, social-cultural and environments surrounding the life of people living in a city. Various factors contribute to the increase or decrease quality of life of a city dweller. A relevant model was generated to measures the quality of life and therefore generate the competitiveness index for a cities or states. The quality of life can be described as the interrelatedness between liveability, sustainability, competitiveness, and wellbeing in its towns and states. This paper will review the two main aspect to evaluate city's competitiveness in the context of Malaysia. The first shall address the definition and the concept of cities competitiveness. The second shall address the indicators used to measure the level of competitiveness in Malaysia.

## **2. Problem Statement**

Policy makers, local authorities or state governments need a form of measures to devise plans and policies in order to assess the quality of life of cities or states. They must be able to identify problems faced by the city, to allow them to allocate budgets and devise planning programs to address the issues effectively. Three set measures have been used by the Malaysia government. These are the Malaysian Wellbeing Index, Malaysian Urban-Rural National Indicators Network for Sustainable Development (MURNInets) and the Malaysian Family Wellbeing Index. Malaysia Wellbeing Index was introduced by the Economic Planning Unit (EPU). It consisted of 2 components, 14 elements and 68 indicators. MURNInets was implemented by PLANMalaysia under the the Department of Urban and Rural Planning. It proposed 5 strategies, with 6 dimensions consisted of 22 themes with 43 indicators. While National Population and Family Development Board (NPFDB) introduced Malaysian Family Wellbeing Index with 7 domains and 24 indicators. Although, there are various measurement did by some agencies, but it still has some argument on it.

## **3. Research Questions**

What are the appropriate definitions and concepts to be used to define city's competitiveness in the context of Malaysia? What are the indicators to measure city's competitiveness? Is the existing model used by some government agencies suitable to measure city's competitiveness in Malaysia?

## **4. Purpose of the Study**

The purpose of this study is to assess the definition and concept of city's competitiveness in Malaysia. Secondly, this study would like to identify the appropriate indicators to measure the level of

city's competitiveness. Finally, this study was carried out to examine whether the existing model or policies as adopted by government certain agencies are suitable to measure the city's competitiveness.

## **5. Research Methods**

This study is basically constructed based on the review of existing literatures on the concepts, determinants and indicator of city's competitiveness. Generally, this study is undertaken by conducting a search of key words comprises of the word competitiveness, concepts, indicators, imbalance growth, and tools to measure city's competitiveness. From this search of existing literature, we discovered numerous numbers of articles, abstracts, findings, results and analysis. This finding was use for the purpose of this review.

## **6. Findings**

### **6.1. Definition and Concept of City Competitiveness**

Competitiveness started as an important concept in microeconomics. It then grew across disciplines and is linked to the concept of quality in public administrative. Vega-Rosado (2006) argued that competitiveness is associated to the potential of technology development. It was affected by the investment in human capital and therefore the element in education. The concept of competitiveness can also be defined as the ability of a firm or organization to increase profitability compared to the competitors. This concept of competitiveness can be explaining from both the micro and macro perspectives. The micro level of competitiveness refers to the ability of the firm and industry while macro level can be explained by cities and country level. It is a need to understanding both level of competitiveness that interrelated with each other. The situation of competition usually will happen in microeconomic and macroeconomic. From the perspective of micro, the concept of competition is seen as the ability of firm to compete and grow continuously to increase profits. From this point of view, competitiveness refers to the firm's ability to produce goods and services that meet the needs of markets in terms of price and quality. The development of the competitiveness for firms are strongly influenced by the competitiveness of its urban areas or state in the term of Malaysia.

The macro perspective competitiveness is defined as an area that a city can encourage the growing of entrepreneurs as their daily activities. The local authority of a city must keep upgrading the capabilities and facilities of the city in order to attract investor to invest. With cost effectiveness, the city can encourage and help the development of firms to be competitive. Thus, competitiveness in this level is refers to the quality of the production factors of a city. Scott and Storper (2003) mentioned that the big amount of profits that generate from the production process in an urban area can contribute to the growth, prosperity and improvement of urban living by providing job opportunities and high wage rates. Besides that, it is also one of the determinants of city's competitiveness which able to impact the overflow of efficiency, innovation and technology. The ability of a city adapts the changes in some aspect such as infrastructure; skilled and educated workers; creative and innovative; quality of life; quality of environmental; and capable of public and private institutions in attracting foreign investment to increase the productivity is called competitiveness (Rondinelli, 2001).

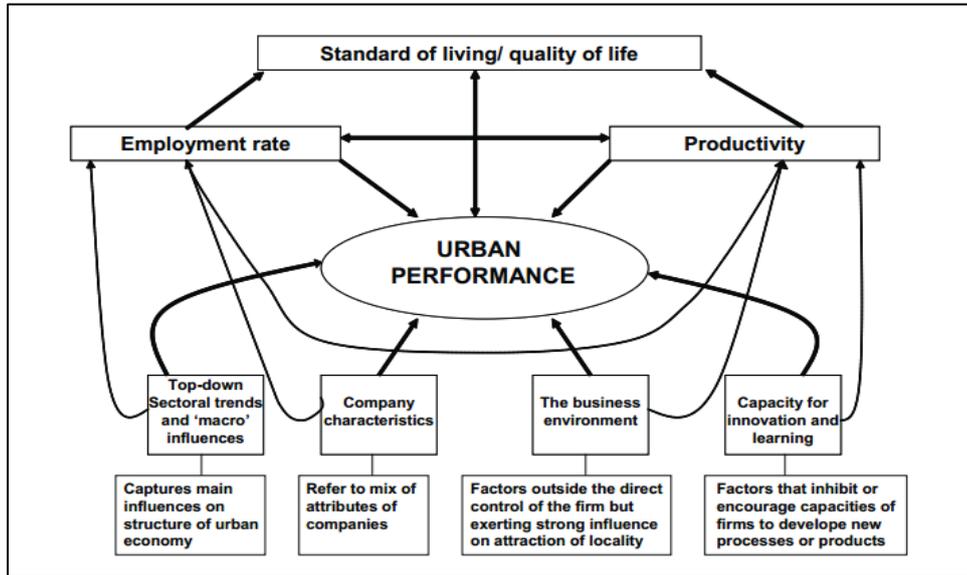
Porter (1990) argued that competitiveness in a city is influenced by four main components that is the quality of endowments, human resources, economic structures and capitals. This concept of competitiveness relates not specifically to the competitiveness of firms but encompasses the economies of scale through industry clustering. Hence, the clustering of industry is an indicator and determinant of the city's competitiveness. Meanwhile, according to Hall and Pfeiffer (2000), urban competitiveness refers to the capability of a city to improve the quality for economic development, provides a competitive environment and effective urban planning with the availability of knowledgeable and skilled labour force. This can have led to the increases in investment flows and foreign capital (Muller & Webster, 2000). Komninos (2000) argued that competitive city can be identified as an innovative city with a wide range of technology and knowledge to promote domestic and foreign investments by focusing on research and development (R&D), building of new products, business networking and finance.

From our review of past literatures, we discovered that the topic of competitiveness has been the focus of both field of economics and geography. Yet, the definition of competitiveness from this two different field are almost similar. For example, International Management Development highlighted that the competitiveness refers to a condition in a country or region in the process of generating wealth. WCR has highlighted the relationship between four competitive inputs namely economic performance, governance efficiency, human resource capability, business efficiency and infrastructure as a major factor in the process of generating wealth. The IMD World Competitiveness Yearbook 2003 pointed that competitiveness is the advantage generated by one city based on certain indicator. Meanwhile the Competitiveness Global Report by World Economic Forum defines competitiveness as a country's capability in achieving sustainable economic growth by focusing on appropriate policies, institutions and characteristics that promote the growth of the country. According to the Organization for Economic Co-operation and Development (2001), city competitiveness refers to the capability of a city to produce goods and services that met the international standard. At the same time, the production system is able to maintain high returns through the expansion of domestic revenues and the increase in job opportunities.

From these various definitions, it is clear that role of firms, urban areas and country are interrelated to achieve the competitiveness of any locality. It can therefore be summarised that the city's competitiveness can be used to explain the ability of a city to develop a quality environment, with increased productivity of the industry that generate higher revenue for a city in long term. The competitive city seeks to generate sustainable economic growth while at the same time increase jobs opportunity and living standards of the society. While firms look at suitable location, cities work to raise the quality of life of its dwellers. The cooperation between industry and firms and city planners will improve productivity and contribute towards economic growth and at the same time raise the standard of living of the society by creating various job opportunities.

Porter (1990) has generated a diamond shaped model to elaborate the competitive advantages of cities, regions and nations. From the Begg (1999) point of view, various influences on urban economic performance can be described as competitiveness factors. By referring to figure 1, the output side represent by standard of living and quality of life. It means, both are the variable are play an important roles and relevant in the evaluation of urban competitiveness. This model is build up by emerging a system with various determinants such as sectoral trends, company characteristics, business environment, and

innovation and learning. According to Begg (1999), the application of diamond model by Porter's (refer figure 1) not only for the economic development but it also workable cities development. Besides that, some of determinants are mutually reinforcing, others contradictory, certain element might just suitable within a time period.



**Figure 01.** The Urban Competitiveness Maze (adapted from Begg (1999))

Kresl (1995) identified two determinants of competitiveness, namely the economic determinants and the strategy determinants. Both are evaluated based on different factors. Economic determinant refers to factors of production, infrastructure, location, economic structure and urban amenities. Strategic determinants are evaluated from the view of government effectiveness, urban strategy, public-private sector co-operation and institutional flexibility.

## 6.2. Malaysia Urban Indicators Network (MURNInet)

The population in Malaysia has been growing rapidly and as such the development of urban areas is becoming important. In 2007, the Department of Urban and Rural Planning, under the Ministry of Urban Wellbeing, Housing and Local Government has developed an approach to measure and evaluate the sustainability of a city through the use of urban indicators. Marzukhi, Omar, Oliver, Hamir, and Barghchi (2011) explained that the indicators selected to measure the level of sustainability might give a brief information about a component and explain further the problem. Further explain by Dekker et al. (2012), this system will also give the opportunities to local authorities in the municipal level increase their innovative, cost effectively and set up vision for some better cities in terms of economic, social cultural and environmental issues.

PLAN Malaysia conducted a study on urban sustainability indicators beginning in 1998 and produced a set of first urban sustainability indicators in 2002. This is known as the Malaysia Urban Indicators Network (MURNInet). It involves 11 major sectors covering 56 sustainability indicators of the city. This indicator was later revised in accordance upon feedback of the various states based on its adoption since 1998 2010. Following this revision, the indicators used were reduced to 40. From 2012 to 2016,

MURNInets has been used as a sustainability measuring tool for cities in Malaysia. In year 2017, the MURNInets 2.0 framework was constructed into 5 strategies, with 6 dimensions, consisted of 22 themes and 43 indicators as shown in Table 1. It is based on the Sustainable Development Strategy developed from the Vision 2020, New Economic Model (MEB), the 11th Malaysia Plan (2016-2020), the Physical Plan Country (NPN) and National Urbanization Policy 2 (DPN2).

This assessment system work as a method to measure and compare the sustainability of the city and region. This system is implemented by all Local Authorities in Malaysia. There is a total of 43 indicators used as an overall indication to assess sustainability of the city under MURNInet 2.0. MURNInet was created based on a computer network framework designed to achieve 4 main objectives which is to assess the level of rural-urban sustainability; to identify the strengths and weaknesses of each local authorities according to the identified indicators; to propose opportunities and potential improvements to enhance the sustainability of a rural-urban; and to monitor the implementation of the defined action plan. By the intention to set up a set of indicator that can analyze the sustainable development might give some positive impact to public (Marzukhi et al., 2011). By using the set of data bases as a main reference point in evaluating the sustainability of a city, various set of indicators have been used. However, the outcome of analysis will be taken by the local authority to plan and focus on the process of problem solving and key issues in the planning and development for a city.

According to Dekker et al. (2012), an indicator system can be used to evaluate the progress of a city development. It can provide a lot of important information about a city. Marzukhi et al. (2011) also argued that this indicator system will ensure that the target of development of a city can be achieve within a certain period of time. Hence, this indicator system can be used as a tool to monitor the progress of city development. The indicator system can also be used to explain the trends of development process qualitatively as well as quantitatively. After analysing the indicators used in MURNINet, we argued that there are some pertinent problems with MURNInet 2.0 in analysing the urban sustainability issues. Some of the data representing certain indicator are states level data while others are from the local authorities. This mixture gives an inaccurate analysis for the particular city development. We argued that instead of focusing on local authorities, it is much more appropriate to analyse it at state level. At the state level, the problem with data can be solved. Table 1 shows the detailed dimension, themes and indicator used to construct MURNInet 2.0 in year 2017.

**Table 01.** Dimension, Themes and Indicator of MURNInets 2.0

<b>Dimension</b>	<b>Themes</b>	<b>Indicators</b>
Competitive Economy	Economic Growth	Job growth rate
	Poverty	Poverty rate
		Urban poverty rate
Private Investment	Private investment growth rate	
Sustainable Environmental Quality	Quality Of Environment	River water quality index
		Air quality index
	Risk Management	Number of initiatives for disaster risk management
	Environmental Management	Percentages of solid waste per capita
		Number of initiatives for environmental management
Environmental education		

Sustainable Community	Home	Percentage of achievement for affordable housing by state targets
	Public Facilities And Recreation	Percentage of residential coverage within 400 meters of community amenities
	Quality Of Life	Ratio of complaint cases with respect to civil disturbance per 10000 people
		The proportion of water borne diseases and vectors per 10,000 people
		Percentage of food business premises with a grading
		Percentage of public toilets with five stars
		Happiness index
	Security	Percentage of crime decrease index
Demography	Dependent ratio	
Optimal Use Of Land And Natural Resources	Land Use Change	Percent change in non-residential area
	Municipal Development	Municipal rate
		Ratio of public open space compared with 1000 residents
		Percentage of application for field gazettement
	Housing	Residential property overhang
Forest Rehabilitation And Tourism Development	Retention of permanent forest reserves	
	Programs / activities / tourism development initiatives	
Efficient Transportation and Infrastructure	Utility Efficiency	Daily domestic water consumption per capita
		Daily consumption of electricity per capita
		Reduction of water disruption case
		Unlimited water loss rate (nrw)
		Reduction of power supply disruption case
		Broadband coverage rate
	Solid Waste Management	Annual rate of recycling
		Percentage of frequency of domestic solid waste collection
	Transportation	Number of integrated public transport terminals/ stations
	Waste Management Of Sewage	Percent of homes have sewerage services
Effective Governance	Delivery System	Percentage of resident satisfaction on the services of local authorities
		The number of community co-operative programs implemented by local authorities
	Institutional Strengthening	Percentage of achievement collection of local authority results
		Percentage of maintenance expenditure as compared to the total expenditure of the entire local authority
		The percentage of expenditure (managing and development) of local authorities
	Enforcement And Monitoring	The percentage of approved planning permission applications comply with local development plans / plans
		The number of execution of integrated enforcement operations carried out with local authorities

### 6.3 The Malaysian Wellbeing Index

Besides MURNInets, several other indices have been created by various agencies to assess and measure liveability, sustainability, competitiveness and wellbeing for society. The Malaysian Quality of Life Index (MQLI) is one of them. The MQLI was started in 1999. In 2011, the Economic Planning Unit (EPU) under the Prime Minister Department released the last report for MQLI. This index was later replaced by a new study called Malaysian Wellbeing Index (MWI) in 2013. MWI comprises of 2 composites, with 14 components, and 68 indicators as shown in Table 2. Both MQLI and MWI was created to measure quality of life of Malaysian encompassing liveability and quality of life of society.

**Table 02.** Composite, Components and Indicator of Malaysia Wellbeing Index

Sub Composite	Components	Indicators
Economic wellbeing	Transport	Road Development Index (RDI)
		Private motorcars & motorcycles per '000 population
		Road length per capita
		Rail ridership
	Communication	Fixed and mobile telephone line subscriptions per '000 population
		Internet subscribers per '000 population
		Number of hotspot locations
		Number of domain name per '000 population
	Education	Pre-school participation rate
		Primary school participation rate
		Secondary school participation rate
		Tertiary participation rate
		Literacy rate
		Percentage of graduate teachers in primary schools
		Percentage of graduate teachers in secondary schools
		National Average Grade (UPSR)
		National Average Grade (SPM)
		Number of lecturers with PhD
		Primary education survival rate
	Secondary education survival rate	
	Income Distribution	Real per capita income (GNP) (RM)
		Gini coefficient based on disposable income
		Incidence of poverty
Working Life	Trade disputes	
	Man-days lost due to industrial action ('000)	
	Industrial accidents	
	Average working hours	
Housing	Percentage of low-cost housing units to bottom 40%	
	Percentage of households with treated water	
	Percentage of households with electricity	
	Percentage of households with garbage collection services	
	Crowdedness (no. of persons per room)	
Leisure	Number of households with paid TV subscription ('000)	
	Domestic hotel guests per '000 population	
	Recreational parks visitors per '000 population	
	Cinema goers per '000 population	

Social wellbeing	Culture	Membership in public libraries per '000 population
		Number of Istana Budaya visitors per '000 population
		Number of museum visitors per '000 population
		Number of Kompleks Kraf visitors per '000 population
	Governance	Percentage of corruption cases prosecuted
		Number of e-payment transactions (million)
		Percentage of cases solved by Biro Pengaduan Awam
		Percentage of e-Filing users
	Public Safety	Crime rate per '000 population
		Road accidents per '000 vehicles
	Social Participation	Percentage of registered voters per population aged 21 years and above
		Number of registered nonprofit organizations per '000 population
		Number of registered residents' associations
		Membership in RELA and Rakan Cop per '000 population
	Health	Life expectancy at birth
		Non-communicable disease cases per '000 population
		Infant mortality rate per 1,000 live births
		Maternal mortality rate per 100,000 live births
		Number of beds in hospitals per '000 population
		Doctor to population ratio
		Hospital waiting time for outpatients (minute)
	Environment	Air quality (Percentage of station with API<50)
		Water quality (Percentage of clean river monitored)
		Percentage of forested land
		Quantity of scheduled waste generated (tonnes/year) per population
		Maximum mean temperature
	Family	Divorce rate (Percentage of population aged 18 and above)
		Domestic violence cases per '000 population
		Juvenile crimes (Percentage of population aged 10 -18)
		Mean monthly household income
Household debt per capita		
Dependency ratio		

Note: Table 02 is adopted from Bakar, Osman, Bachok, Ibrahim, and Mohamed, (2015)

## 7. Conclusion

In a conclusion, local authority faces various difficulties to generate data to evaluate the issue of urban competitiveness. From past literature we found that the majority of the indicator used to evaluate urban competitiveness focused on productivity, output and trend of investment. The major problem is the lack of appropriate quantitative data. If there are the availability of data, it might not show the performance of one particular city. For example, most of the data of the city of Johor Bahru is related to Johor, while Georgetown is related to Penang. The index created by MURNInets shown the liveability, sustainability and competitiveness of local authorities. Due to the problem of availability data for local authority, certain data used to measure the index was taken from states data. This produced a confusing and an inaccurate measure because the difference in the data set used. In the context of Malaysia, the empowerment of a local authority is limited compared to the state government in term of decision making, budgeting, development plans and so on. Malaysia Well Being Index was developed to measure the liveability and quality of life of

Malaysia citizen as a whole. It might not look into every state in Malaysia separately. There is an imbalance growth among the state in Malaysia. It can be shown from the GDP per capita by state. It a big different between the highest and the lowest GDP per capita state in Malaysia. To ensure the gap of imbalance growth among the state in Malaysia getting closer, some polices of study must be implement. This study is the review the indicator and index has been implement in Malaysia and deliver a better model to measuring competitiveness for the state level.

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## References

- Bakar, A. A., Osman, M. M., Bachok, S., Ibrahim, M., & Mohamed, M. Z. (2015). Modelling Economic Wellbeing and Social Wellbeing for Sustainability: A Theoretical Concept. *Procedia Environmental Sciences*, 28, 286-296.
- Begg, I. (1999). Cities and competitiveness. *Urban studies*, 36(5-6), 795-809.
- Dekker, S., Jacob, J., Klassen, E., Miller, H., Thielen, S., & Their, W. W. (2012). Indicators for Sustainability: How cities are monitoring and evaluating their success. *Sustainable Cities International*, 84.
- Hall, P., & Pfeiffer, U. (2000). *Urban future 21: A global agenda for twentyfirst Century Cities*. New York: Macmillan College Pub Co.
- Komninos, N. (2000). *Intelligent cities: Innovation, knowledge system and digital space*. London: Spon Press.
- Kresl, P. K. (1995). The determinants of urban competitiveness. In P. Kresl & G. Gappert (Eds.), *North American Cities and the Global Economy: Challenges and Opportunities* (pp. 45-68). London: Sage Publications.
- Marzukhi, M. A., Omar, D., Oliver, L. H. L., Hamir, M. S., & Barghchi, M. (2011). Malaysian Urban Indicators Network. *A Sustainable Development Initiative in Malaysia*, 25(1), 77-84.
- Muller, L., & Webster, D. (2000). Urban competitiveness assessment in developing country urban Region: the road foward. Paper presented in the World Bank Course. Retrieved from [https://www.kas.de/c/document\\_library/get\\_file?uuid=31f06e4a-d202-492b-7e8b-d61539e22&groupId=252038](https://www.kas.de/c/document_library/get_file?uuid=31f06e4a-d202-492b-7e8b-d61539e22&groupId=252038)
- Organization for Economic Co-operation and Development (2001). *Innovative clusters driver of national innovation system*. Paris: OECD.
- Porter, M. E. (1990). New global strategies for competitive advantage. *Planning Review*, 18(3), 4-14.
- Rondinelli, D. A. (2001). Making metropolitan areas competitive and sustainable in the new economy. *Journal of Urban Technology*, 8(1), 1-21.
- Scott, A., & Storper, M. (2003). Regions, globalization, development. *Regional studies*, 37(6-7), 579-593.
- Vega-Rosado, L. L. (2006). The international competitiveness of Puerto Rico using the Porter's model. *Journal of Global Competitiveness*, 14(2), 95-111.