

Abstracts of the National Statistics Conference 2006

A National Statistics Conference 2006 (the Conference) was organised by the Department of Statistics, Malaysia (DOSM) from 4 – 5 September 2006. The theme of the Conference was “Statistics for National Development”. The Conference was officiated by the Honourable Deputy Minister in the Prime Minister’s Department, Dato’ Hj. Abdul Raman bin Suliman. The objectives of the National Statistics Conference 2006 were :

- ▶ *as a vehicle between the statisticians, experts in statistics and users to discuss and highlight the issues relating to statistical needs for development planning and implementation of the nation’s major policies; and*
- ▶ *to inform users of the role of DOSM in national development.*

The abstracts of the papers presented are as follows :

Econometric Analysis of Malaysian Household Expenditures: A Study of Selected Household Items

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Data from the Malaysian Household Expenditure Survey (1998/1999) are used to conduct econometric analysis to examine Malaysian household expenditure patterns on selected items or activities. These include fish and seafood products (fresh fish, shellfish, and processed fish), food-away-from-home, recreation, gambling, and tobacco products.

Econometric models used include the censored Tobit model and the Heckman Two-Step procedure. Results of the analysis indicate that socio-demographic characteristics significantly affect household expenditure patterns on the household items or activities. Based on these results, several observations are noted.

Poverty Measurement Using the Expenditure Approach

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The first and foremost of the Millennium Development Goals is halving absolute poverty by the year 2015. Reduction of the number of absolute poor whose incomes or expenditures are less than \$1/day is the goal to be achieved at the national, regional and global level. Accurate measurement and monitoring of the incidence and severity of poverty constitute an important element in formulating, implementing and evaluating poverty reduction strategies adopted at the national level. The paper provides an overview of the methodology used by the World Bank in the compilation of the estimates of absolute poverty using the \$1/day and \$2/day international poverty

lines. The paper describes the role of household expenditure surveys and the use of expenditure data in the determination of poverty lines and the estimation of incidence and severity of poverty. A brief description of the current effort on the compilation of poverty-specific purchasing power parities (PPPs) in the Asia-Pacific region is also provided.

Making Policy Work Coherently: The Challenge for Malaysia's Manufacturing Industries

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The success of the East Asian miracle economies has tempted many developing economies to emulate their policies. While this may result in short-term gains, two crucial aspects of policy making for long-term gains - the importance of weighing the trade-off in the effects of policy, and the consequent need for coherent policy coordination, have been overlooked. This paper uses empirical investigation and evidence on Malaysia's manufacturing industries as a case study to draw important lessons for developing economies to make policy work. It is shown how the failure of current policies to take explicit account of the interrelationship between the sources of total factor productivity growth have major repercussions on the long term objective of achieving optimal and sustainable economic growth.

Global Positioning of Malaysia's Small and Medium Enterprises and the Effectiveness of Governments Promotional Initiatives

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The development of Small and Medium Enterprises (SMEs) forms an integral component of initiatives for Malaysia to achieve sustainable economic growth and developed country status by 2020. The Government's formulated policies and launched programmes under the First Industrial Master Plan (IMP1), 1986 -1995, and Second Industrial Master Plan (IMP2), 1996-2005, to facilitate the development of SMEs and increase their participation in and contribution to the economy. Policy instruments and incentives were introduced to enhance SMEs' contribution to value-added, output and employment in the manufacturing sector.

Under the Third Industrial Master Plan (IMP3), 2006-2020, SMEs are expected to contribute significantly to the transformation of the economy into a fully developed and industrialised nation by 2020. The IMP3 will create the institutional and systemic conditions to support the upgrading of firm level capabilities, as well as the

diversification and creation of new firms. This will contribute towards realising Malaysia's long-term goals to achieve business and industrial competitiveness in an increasingly globalised economic environment.

Owing to the growth potential of the services sector and the presence of support mechanisms, institutional and systemic support will focus on this sector to stimulate industrial growth and structural change. Emphasis will be given to diversification as well as support for high value adding service sub-sectors, such as research and development (R&D), education, training and information and communications technology (ICT).

The Small and Medium Industries Development Corporation (SMIDEC) established in 1996, aims to develop SMEs in tandem with the country's industrialisation process. Under the IMP3, SMEs will be encouraged to internationalise their operations and adopt cutting edge technologies to assist innovative and competitive firms. SMEs will also be encouraged to compete with leading firms in strategic industries. In addition to the greater use of commercial funds, financial support for these firms will be based increasingly on performance grants, rather than subsidies.

Various other government agencies provided assistance to integrate ICT into the business processes of SMEs is seen through the 'E-Manufacturing Grant' as well as the 'RosettaNet Enterprise Model' and 'RosettaNet Application Service Provider' (ASP) Model Grant Scheme. The latter is catered to help electrical and electronics enterprises to integrate into the international supply chain. Adoption of the RosettaNet is a common messaging standard for communications in the electrical and electronics sector. For other sectors, the initiative of the United Nations via the ebXML (e-business Extensible Mark-Up Language) had been introduced in 1999 to enable enterprises of any size in any geographical location to communicate data in common terms and to define and register business processes. The former pertains to the implementation of e-manufacturing applications such as 'Enterprise Resource Planning' (ERP) so as to increase the value added and productivity and to reduce the turnaround time and costs of SMEs.

These grants have been formulated by the Malaysian Ministry of International Trade and Industry (MITI) in collaboration with SMIDEC after a survey in 2002 found that:

SMEs in the manufacturing sector are characterised by low levels of technological capabilities arising from inadequate capital investment and thereby unable to ensure product quality or to meet market requirements. The findings of SMIDEC further indicate that the low usage of technology among the SMEs is a constraint to enterprise growth and expansion. A survey carried out by SMIDEC and the National Productivity Centre in 2003 found that 69 percent of the firms use their own technology, another 22 percent operate on licensed technology and less than 5 percent of firms have fully automated their operations whilst another 75 percent are semi-automated.

SMEs will be encouraged to shift emphasis from solely targeting price-based competition to product-based competition (comoditisation of products). The former is characterised by low margins as it relies on reducing costs whilst the latter enjoys high margins as it is driven by new product development. Non-price factors should be emphasised – these factors affect the quality of products or the production processes,

among others; human resources, technological capabilities and managerial factors. Outsourcing is seen as the fastest growing strategy in terms of saving valuable time and resources. SMEs can focus on building and enhancing core competencies by delegating non-income-earning functions to other expert companies. Utilisation of resources can be optimised and pave the way for SMEs to operate more efficiently and effectively.

The financial support to SMEs gradually must shift from preferential cost of financing subsidies (other terms) to grants. The instruments of prioritisation for SMEs governed by Bank Negara Malaysia should be maintained to support promising SMEs that lack financial support. The change from a hand-holding to a performance based approach will assist SMEs meet the global environment better.

Some Applications of Data Mining

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In today's information age, the massive amount of business data (business transactions, products and prices, etc.) can be analysed and modeled using data mining techniques. Data mining involves the process of translating business needs into a problem which has to be analysed, retrieving the database with large amount of data for analysis, and applying statistical or machine learning technique with the final aim of achieving important results for taking a strategic decision to solve the business problem. As an example, data mining is widely used in Customer Relationship Management where the primary objective is to encourage customer loyalty so as to obtain as much value as possible from their customers. Customer loyalty provides competitive advantage and is a key determinant of a firm's financial performance, growth and survival. In a business environment, it is important to know what is the probability that an existing customer will be a repeat customer, and does this probability varies based on certain factors or purchase behaviour of the customer? This paper gives an illustration of predictive modeling using SPSS Clementine to model churn management. A customer is defined as loyal if he/she does not terminate the phone service. The response variable is a binary variable (1=churn, 0=did not churn). The term churn here is defined as a customer who has terminated the phone service. Predictive modeling techniques such as logistic regression, decision tree and neural network will be applied to the data and compared to get the best prediction model.

Keywords: Data mining; churn management; logistic regression; decision tree; neural network

The Use and Abuse of Statistics

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Everyday we encounter data and make conclusions based on them. In today's society, statistical techniques are being used with increasing rate in business, agriculture, social sciences, government sectors and applied sciences such as engineering to interpret data and use them to make decisions. Since statistical methods are used frequently to help policy makers make decisions, it's very vital for the researchers to have basic understanding of statistics. Because of the easy availability of the statistical packages such as SAS, SPSS, MINITAB etc, researchers who have a little knowledge in statistics have a greater scope to abuse statistics while analysing their data. Without adequate knowledge in statistical techniques such as design and analysis of experiments, researchers simply instruct the packages to analyse data using their convenient design. It is very important to note that statistical packages just follow the instructions given to them and produce results accordingly. They do not know whether researchers have chosen the correct statistical techniques for their studies. Consequently, meaningless and misleading conclusions are obtained from an incorrect analysis. Due to lack of awareness, the policy makers often rely on these results to make decisions and that brings disaster to a community or to a country.

In this paper, we will discuss inferential statistics, which allows us to draw reliable conclusions based on sample data if appropriate statistical techniques are used. The conclusions drawn from a study are to be trusted only when correct sampling methods are used to collect a sample. Furthermore, it is usually unwise to rely on the results of test procedures unless the validity of all underlying assumptions such as independence, normality and purity (free from outliers) of observations, have been checked. Violations of these basic assumptions may produce sub-optimal or even invalid inferential statements and inaccurate predictions. In this paper, we will consider some remedial measures when the data do not satisfy the basic assumptions.

Growth Triangles and Its Implication on Regional Economy in Malaysia: A Stochastic Convergence Analysis

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For the last twenty-five years, Malaysia has been recognised as one of the most dynamic countries in the Asian region. Among the ASEAN economies, Malaysia's economic growth has surpassed that of the other ASEAN nations including also the industrialised countries. Despite these achievements in the international arena, disparity in income across states in Malaysia continues to be a matter of concern. The existence of regional inequalities and the prospect that these inequalities may widen were recognised by the Malaysian government. The eight volumes of the 5-Year

Malaysia Plan reflects the sincerity of the Malaysian government in alleviating if not eradicating the problem of regional or states imbalances. Accordingly, in their quest to achieve both development and equity at the same time, policies and strategies are continuously being formulated and implemented across the states. The recent Ninth Malaysia Plan has again emphasised regional development policies in bridging the gap between regional disparities for the next five years. One way to reduce imbalances amongst region is through promoting “growth triangle”. Thus, the purpose of the present study is to investigate empirically the question of economic convergence in regional per capita GDP on one of the growth triangles - The Brunei Darussalam-Indonesia-Malaysia and the Philippines-East ASEAN Growth Area (thereafter BIMP-EAGA) for the period between 1983 and 2003 using a time-series framework. Based on the stochastic convergence definition suggested by Bernard and Durlauf (1995) and using three different approaches of cointegration analysis and three commonly used panel unit root testing procedures proposed by Levin et al. (2002), Im et al. (1997) and Maddala and Wu (1999), our findings strongly support stochastic convergence hypothesis for BIMP-EAGA for the period after the financial crisis, that is, for the years 1998 to 2003. An important implication of this study is that BIMP-EAGA regional policies, on average, have positive impact on income per capita in all regions.

The Changing Pattern of Spatial Economic Structure in the Asia-Pacific Region: An Analysis by Using the 1985, 1990, 1995 and 2000 Asian International Input-Output Tables

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Until the first half of the 1990s, the Asian region was an important region for the global economy, with its sustained economic development. In Asia during this period, the maturing of NIEs, the catch-up by ASEAN countries, and the rise of China were observed successively. The Asian financial crisis of 1997 affected these countries/regions to varying degrees according to the degree of maturation of their economies. Some ASEAN countries, including Indonesia, Thailand, and Malaysia, were forced to devalue their currencies substantially, while Korea was compelled to carry out massive restructuring at home. However, China felt little impact of the currency crisis, though Hong Kong was affected very much. After all these developments, the Chinese economy has boosted its presence in the Asian region.

Generally, over the past 20 years Asian countries have achieved a certain degree of economic growth and at the same time deepened spatial interdependence.

The Institute of Developing Economies (IDE) has been compiling international input-output tables as a tool for analysis of economic interdependence and its changes among countries/regions in the Asia-Pacific region. In January 2006, IDE completed the 2000 Asian International Input-Output Table (AIO table), which covers eight East Asian countries/regions (South Korea, China, Taiwan, the Philippines, Malaysia, Singapore, Thailand and Indonesia) as well as Japan and the United States. With the completion of the 2000 AIO table, the IDE now has AIO tables covering most of

Asia-Pacific countries/regions for five different time points (1975, 1985, 1990, 1995, and 2000).

Given the dynamic changes in the economies of East Asia, this paper summarises the characteristics and their patterns of change in industrial structures and trade structures of the countries/regions in the Asia-Pacific region from the three viewpoints of time, space, and industry, by using the AIO table for 1985, 1990, 1995, and 2000. The analysis in this paper produced very significant findings as follows; (1) Industrial structures undergo changes in tandem with economic growth; (2) The Chinese economy is enlarging its presence in terms of trade structure as well; and (3) Diversification of regional trade is helping intensify interdependence among countries/regions in Asia, and the Asian economies are certainly moving toward integration.

The Impact of AFTA on Japan-ASEAN-5 Trade Flows

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Japan is one of the most important trade partners for ASEAN countries. Unfortunately the bilateral trade flows between Japan and these countries are asymmetrical, as most of these ASEAN countries have sustained a trade deficit with Japan, while Japan is running a trade surplus with these countries since 1990s. Japan's total imports from these countries constitutes only a small proportion of its total import. In view of the urgency to enhance production efficiency and trade competitiveness, the ASEAN countries have adopted the ASEAN Free Trade Area (AFTA) in 1992, which will be fully established by 2010 with all the import tariffs eliminated for the six original members, and by 2015 for the new members. Under this new economic integration, it is therefore crucial to ask whether trade flows between these countries with the rest of the world will be significantly improved, and which ASEAN countries will be benefit from this establishment. This study attempts to extend the previous regional studies in two folds. First, we construct a simple model based on the Common Effective Preferential Tariff (CEPT) Scheme to compute an index that measures the progress of AFTA establishment of each ASEAN-5 countries. Secondly, the computed index is then used to determine the impact of AFTA on the bilateral trade flows between a non-integrator, Japan, and each of the ASEAN-5 countries. Our estimated results based on the unrestricted vector-error-correction model of autoregressive distributed lag (ARDL) modeling approach, show that, exports from the ASEAN-5 countries to Japan have increased significantly after the implementation of AFTA, except Indonesia. The results also indicate that, in term of exports to Japan under AFTA, the Philippines and Malaysia will be benefit most in the long run.

Modelling and Forecasting on the Malaysian Inflation Rates: An Application of Garch Models

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The main objective of this paper is to explore the varying volatility dynamic of inflation rates in Malaysia for the period from August 1980 to December 2004. The Generalised Autoregressive Conditional Heteroscedasticity (GARCH) and the Exponential Generalised Autoregressive Conditional Heteroscedasticity (EGARCH) models are used to capture the stochastic variation and asymmetries in the economic instruments. An in-sample evaluation of the sub-period volatility is done using both models. Results show that the EGARCH model gives better estimates of sub-periods volatility.

Deseasonalising Economic Time Series for Non-Fixed Seasonal Effect

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Time series data are used extensively for major policy and decision making purposes as they provide significant information to the direction, turning points and consistency between other economic indicators. However, comparisons over a short time frame such as changes from month to month or quarter to quarter are rather difficult to achieve. For instance, series may show different behaviour over time and that they can vary in their size and the time period in which they occur. These fluctuations are called "moving holiday effects". Such moving holiday effects may mask the underlying trend movements and thus provide inaccurate signals for decision making. Thus, if the seasonal effects can be removed, then the masking effects could be eliminated and that the behaviour of the series could be better viewed. Incidentally, in Malaysia, all the time series data are published without seasonally adjusting the moving holiday effects. Hence, to eliminate the moving holiday effect and seasonally adjusting the Malaysian economic time series data, a standard procedure to remove Malaysian moving holiday effects is needed. Therefore, it is the objective of this paper to present procedures that can be used to model and to remove the moving holiday effects.

Keywords: Moving Holiday Effect; Trend Movement; Seasonality.

Applying GIS Application in Analysing Socio-Spatial Disparities in the State of Selangor

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Geographic Information Systems (GIS) has emerged as a new tool of presenting socio-economic data. Since its inception and use in the early 1990's, GIS development has gone further by incorporating statistical data within its analytical functions. Not only can it present data spatially but also in displaying graphs for each spatial data displayed. GIS should not be seen only as a mapping tool but more than that. It is able to display data spatially in time series. This will assist decision making at the stakeholders level. The purpose of this paper is to describe the capabilities of GIS application in analysing socioeconomic data. Data were collected and statistically calculated. Databases were developed for both spatial and attribute data. The former consists of all the districts in Selangor and the latter consists of development composite index over a period of 1970-2000. Both types of data were combined and analysed using GIS. The results were displayed in maps and graphs. The state of Selangor was selected for this purpose since the state is located nearest to the Federal Territory of Kuala Lumpur which is one of the most economically developed states in Malaysia.

Modelling of Cohort Fertility Changes Among Major Ethnic in Peninsular Malaysia

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The aim of this paper is to trace fertility changes among major ethnics in Peninsular Malaysia for birth cohorts of 1931-1970 by means of modelling. The combined marital fertility model and nuptiality model proposed by Coale-Trussell and Coale-McNeil respectively is utilised to trace the changes. The models combined able to generate estimates that elucidate patterns of changes in age of marriage, deviation of fertility from natural fertility and level of birth control practices, which contribute to changes in fertility. Birth series from 1957 to 2000, of three major ethnics in Peninsular Malaysia, reported in the form of age specific fertility rates are utilised in the modelling. Because of the availability of such a long birth series, fertility changes among different generations can be compared. Based on estimates of the model, marital fertility schedules for three generations; grandmother, mother and granddaughters' cohorts are generated and they are then compared. The analysis shows that there is a trend towards delayed childbearing especially among cohorts of granddaughters and mothers compared to the grandmother's cohort due to delay in age of marriage.

Marital fertility rates of granddaughters and mothers are much lower than that of the grandmother's. Such trend is more significant among the Chinese and the Indians but

less obvious among the different generations of Malay. Comparisons made between cohorts of grandmothers, mothers and granddaughters of their fertility schedules reveal that in general, the Malay daughters tend to adopt their mothers' fertility behaviour especially after certain reproductive age, that is, 27 years. For the Malays, cohort of granddaughter portrays slightly higher fertility than that of the mother's and the grandmother's during reproductive age of 15 to about 27 years. After certain age (27 years old), changes in the fertility pattern of the grandmother, mother and granddaughters' cohorts are observed to be almost similar.

Keyword: cohort fertility, fertility schedules, natural fertility, age of marriage.

An Architecture for the Development of a National Sampling Frame for Business Establishments and Individuals Sourcing and Integrating Administrative Data from Government Agencies

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A perfect sampling frame is one in which "every element appears on the list separately, once, only once, and nothing else appears on the list" (Kish, 1965). This requirement forms a major challenge for any organisation that is responsible in the development of a sampling frame for business establishments and individuals such as the Department of Statistics Malaysia (DOSM).

This paper attempts to propose an architecture for the development of a National Sampling Frame for Business Establishments and Individuals for Malaysia based on a study that has been carried out on the existing frame used in DOSM, the requirements of the sampling frame users and the other government agencies.

The analysis on the state of the current frame indicates that the frame on establishments is fairly clean and the population coverage is partially exhaustive. Hence, with proper data cleaning and updating process, the existing frame can be the initial basis towards the development of the sampling frame for business establishments.

However, DOSM do not have a frame on individuals. Surveys on individuals per say cannot be carried out due to the lack of a frame regarding individuals, but surveys that has been carried by DOSM on income, expenditure and labor force are on household basis. This is made possible due to the availability of a household frame.

A study on the availability of individual profile data collected for administrative purpose by the other government agencies has been carried out. The purpose of this study is to ascertain whether it is possible to tap all the administrative data for the development of the individual's sampling frame. Finally, the paper proposes a model integrating the various building blocks i.e. business establishment frame, census frame and administrative data of individuals which provides a concept towards the establishment of a common national sampling frame of business establishments and individuals.

Determinants of Economic Growth: FDI, Education and Openness

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In this paper the dynamic relationships between foreign direct investment (FDI), domestic investment as well as other determinants of economic growth are examined. Both the short-run and long-run growth processes are modelled using ARDL approach in cointegrate analysis for five ASEAN countries. The major results can be summarised as follows: (i) domestic investment, FDI, human capital and financial intermediation significantly affect growth; (ii) FDI has a positive and significant effect on growth but is of lesser magnitude than domestic investment; and (iii) we find strong support for an export-led and investment-led growth hypothesis in all the countries. All in all, our empirical results suggest that investment and exports are the engines of growth and it is worthwhile for the authorities to encourage domestic as well as foreign capital to put these countries back on their pre-crisis growth paths.

A Conceptual Discussion of the Tourism Satellite Account: Implementation and Issues

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The development and growing needs of hospitality and tourism sectors have bestowed the idea of international organisations such as World Tourism Organisation (WTO), United Nation (UN) and Organisation of Economic Cooperation and Development (OECD) to develop a framework of tourism statistics that is accepted universally. This has led to the call to the development of Tourism Satellite Account (TSA) which received official approval by United Nations in March 2000. In 2001, Malaysia has started to put a step into the development of this account and currently have seen progress in the process. Few countries may have successfully implemented the whole process but yet, this framework has not gained popularity in most countries. Cooperation between the providers and the producers of the statistics in these countries are vital in order to produce valid and reliable information. The basic exploratory research that is done based on intensive literature review has brought up the idea of exploring the possibility of Malaysia to profoundly develop TSA in order to get a clear picture of the contribution of tourism industry to this country. This paper aims to provide a basic understanding of the anatomy of TSA, development and positive effect of the implementation of this framework together with conceptual TSA issues which might be crucial in the initial constructions and for on-going maintenance of TSA with the intention to provide a comprehensive and a practical result.

Development of E-Money in Malaysia

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This paper examines the consumer reactions to the various e-money initiatives in Malaysia and also examines the short and long run effects of the alternative payment mechanisms on the currency in circulation. With regards to consumer reactions, there are positive signs which are however, marred by the lack of support by the issuers particularly in relation to reload facilities and general acceptability of the e-money initiatives. The study also indicated significant short and long run effect of e-money and several other payment alternatives on the currency in circulation. The evidence seems to support the belief that payment alternatives such as e-money and credit cards would replaced currency in circulation both in the short run and in the long run.

Productivity and Competitiveness Drives National Development

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This paper provides an overview on the two important elements that drives the national development namely; productivity and competitiveness. It gives an insight on the understanding of productivity and competitiveness which has been a current issue of interest in both economic and business terms. This paper also attempts to discuss Malaysia's productivity performance and competitiveness ranking as compared to other countries based on various economic and performance measures. The productivity driven growth strategy or TFP was elaborated as a means to increase the economic growth. Determinants of TFP growth such as quality of workforce, capital structure, technical progress were identified as a way to bring the economy to a higher production frontier, with more efficient use of factor inputs. This paper concludes with initiatives to enhance the competitiveness both at national as well as at the organisational levels.