



# MYSTATS 2020

## CENSUS SHAPES NATION'S FUTURE

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# PARALLEL SESSION 1

# DETERMINANTS OF STARTING SALARY OF BACHELOR'S DEGREE GRADUATES: A CASE STUDY

<sup>1,2</sup>Nora Mohd Basir\*, <sup>2</sup>Rohana Jani, <sup>3</sup>Yong Zulina Zubairi, <sup>2</sup>Diana Abdul Wahab

## Abstract:

Over the years, great emphasis have been placed on graduate employment rates as it places great importance on the aspect of institutions' relationship with the labour market. However, there is little attention on a more pertinent question if starting salary of graduates commensurate to the qualification obtained. Clearly, starting salary will vary by the field of study but surely there are other factors too. This paper attempts to examine the most significant variable contributing to bachelor's degree graduates starting salary using the empirical evidence. Here, we utilized the Graduates Tracer Study data collected by the Ministry of Higher Education Malaysia. With a total of 1,485 graduates from one of the public universities in Malaysia who were employed at the point of time the data was collected, findings show that only 40.4% of this fresh graduate gain graduate salary for their starting salary. Using CHAID analysis, we obtained 5 branches and 12 nodes. The analysis indicated that graduate salary status was explained by certain factors including field of study, MUET, CGPA and gender. As expected, the most important significant characteristics for graduate salary status was found to be the field of study. The implications of the results are also discussed.

**Keywords:** CHAID analysis, Higher Education, Fresh graduates

# HUMAN POPULATION PROJECTION IN MALAYSIA USING BAYESIAN PROBABILISTIC METHOD

*Asmida Mustafa\*, Noor Azina Ismail*

## **Abstract:**

For any country, human population projection is vital for future planning. The projection is widely produced through conventional or frequentist methods and was not accompanied by any quantitative estimates of uncertainties. Developing countries, for instance, face numerous problems with demographics and so to improve on the national registration system, the quantitative estimates of uncertainty need to be measured and provided. This not only provides the data but also ensure that data are available, reliable, and valid. In order to achieve this goal, we produced estimates based on a Bayesian probabilistic method of human population projection in Malaysia which portrays a better projection than the conventional method. We applied the census population data and employed the Monte Carlo Markov Chain algorithm to calculate the posterior distributions of the parameters from the demographic components of total fertility rate and life expectancy at birth. Then, they are converted to age-specific rates and combined with a cohort component projection model. The findings demonstrate that the high, medium and low variance approach to communicating the uncertainty problem in the deterministic cohort-component projection method tends to over-projected and under-projected the total human population projection in Malaysia. The Bayesian probabilistic projection method produces better projection values that allow for the use of observed data by applying some reasonable priors.

**Keywords:** Bayesian hierarchical model, Cohort component projection method, Monte Carlo Markov Chain



# MODELLING DETERMINANTS OF PENSION COST: NEW EVIDENCE FROM MALAYSIA

*Muhammad Irfan\*, Wee-Yeap Lau*

## **Abstract:**

The rapidly rising pattern of pension costs for public servants in Malaysia has been a serious concern for policymakers. This paper aims to investigate the determinants of pension cost in Malaysia. Since the pension cost is part of operating expenditure, three dependent variables, namely pension cost, operating expenditure and percentage of pension cost to operating expenditure are used. Using time series data from 1971 to 2020, our results show the number of retirees, Malaysia population growth rate, Malaysian population over 65, Malaysia Annual Gross National Product (GNP), annual emolument, life expectancy, and Consumer Price Index are important determinants to the pension cost. The model with different dependent variable provides another perspective of looking at the issue. As policy implication, the Government should look into the policy variables and provide some scenario planning as to strike a balance between future manpower needs and fiscal space in future years to come. This study will provide input as to how to improve the public service appointment pension schemes.

**Keywords:** Pension scheme, Public Servant, Malaysia, Population, Fiscal Budget

# UNCERTAINTY AND EXCHANGE RATES - GLOBAL DYNAMICS

*Suah Jing Lian*

## **Abstract:**

This paper offers two points on the impact of uncertainty and exchange rate shocks on output. (1) A conceptual model where aggregate inefficiencies stem from rational inattentiveness and bounded expectations amongst agents. Interaction with uncertainty generates output losses. Central banks can target these macro-behavioural frictions to stabilise output and prices. (2) Empirical findings from a panel of advanced and emerging economies. Output and inflation slow in response to uncertainty shocks. Long-term government bond yields moderate and exchange rates depreciate, suggesting within-country and between-country flight-to-safety, respectively. Exchange rate appreciation shocks generate similar responses. The Malaysia-specific analysis also finds Balassa-Samuelsson effects, where divergent responses in productive tradable and less productive non-tradable sectors lead to differing employment and output dynamics. In a panel fixed effects and quantile regression setting, I find indicative interaction between output, exchange rate and uncertainty, and a distributional dimension.

**Keywords:** Uncertainty, Rational Inattention, Bounded Rationality, VAR

# ACCESS TO ALTERNATIVE FINANCING SOURCES AMONG SMES IN MALAYSIA

*Ree-Ann LIM, Noor-Azina ISMAIL, Yongqiang LI*

## **Abstract:**

Despite the economic contributions of micro-, small- and medium-sized enterprises (SMEs), SMEs still face significant challenges in acquiring external finance from banks, leading to a gap in their funding. Alternative finance can help to bridge this funding gap by offering new financing opportunities for SMEs. As of 2019, the adoption of alternative finance in Malaysia is still low, constituting only 3.0% of total SME financing. This may be due to the presence of information asymmetry between lenders and borrowers. However, findings of using demographic characteristics of the borrower as a source for soft information to mitigate such information asymmetry are inconclusive, and firm characteristics have never been studied in the context of alternative finance. This paper investigated the impacts of firm and owner/manager of Malaysian SMEs on access to alternative finance using secondary survey data consisting of 150 SME firms from West Malaysia. Logistic regression was used to estimate the probability of accessing alternative finance among Malaysian SMEs. The logistic equation specified access to alternative finance as a dependent variable, while firm and owner/manager characteristics as predictors. The findings indicate firm characteristics in terms of ownership structure and business stage influence Malaysian SMEs' access to alternative finance, while no evidence was found for owner/manager characteristics. This study extends on the current understanding of the role of soft information and highlights the importance of firm characteristics in the process of successfully accessing alternative finance. This paper concludes with suggestions for policymakers and SME borrowers to increase SMEs' access to alternative finance.

**Keywords:** SME lending, SME financing, Alternative Finance, Information Asymmetry

# CAUSAL RELATIONSHIP BETWEEN INTERNATIONAL FINANCIAL REPORTING STANDARD (IFRS) & FOREIGN DIRECT INVESTMENT (FDI)

*Maryam Yousefi Nejad\*, Nabilah Rozzani, Nur Hafizah Roslan*

## **Abstract:**

This study investigates the causal relationship between International Financial Reporting Standard (IFRS) adoption and Foreign Direct Investment (FDI) inflows in ASEAN countries during the period of 2001 to 2016. This study applies panel co-integration and causality test to examine the short and long run and causal relationship between variables. IFRS adoption was measured based on dummy variable in Model 1 and level of IFRS compliance in Model 2. Findings of this study confirm the presence of co-integration between variables and the Dynamic Ordinary Least Square (DOLS) estimation analysis reveals positive and significant relationship between IFRS adoption, based on both measures and FDI inflows. Furthermore, the causality test shows that there is short run causality from IFRS to FDI inflows and long run causality between variables. This study extends knowledge on the relationship between IFRS adoption and FDI inflows by examining this relationship in the setting of ASEAN countries. Findings of this study could be useful for countries which are IFRS adopter and also non-adopters to understand the economic consequences of IFRS adoption, in their effort to attract more investors so as to accelerate economic growth.

**Keywords:** IFRS adoption, Foreign Direct Investment (FDI), ASEAN countries, Dynamic Ordinary Least Square (DOLS), Causality relationship

# LEVERAGING OPEN API: INTERCHANGE NETWORK DATA FOR URBAN ACCESS TO HEALTH SERVICES

*Ahmad Najmi Ariffin*

## **Abstract:**

In this paper, we present an approach that leverages API technologies to evaluate urban accessibility to health services and mapping the access challenges exist. Using Pandana Python package, the underlying data structures is created for each network with only a few lines of code. The queries seize a network data from OpenStreetMap (OSM), generate the health services data that users of OSM have logged, and calculated values of various measures of access to destinations. Although there are advantages to the GIS approach, we think network queries are more accurately depicting how people interact with environment (Maurer, 2020). Requesting network data within bounding box (Kuala Lumpur, Malaysia), returning OSM data with 83,799 nodes and 115,874 edge table creation. It took 206.11 seconds to completed download 36,231.2 kilobytes OSM data. Real-time mining found 74 dental clinics, 2 hospitals, 267 clinics, 140 public transport stations and 23 public transport platforms located within designated area. Parameter are set at a max distance of 1000m for up to the 3 nearest POIs: dental clinics, the proximity distances calculated in average 962.29m ( $\pm$  137.89). Calculation of an aggregation showed that 6 units dental clinics are located within 500m of each node and 10 units within 1000m. Spatial distribution of health services within Kuala Lumpur proved that city-wide accessibility across multiple places with less than 2 minutes travel time from one location to another. Implementation of API will reduce development time, support quality data that are accurate, and broaden the variety of public health management applications available.

**Keywords:** spatial analysis, API, Python Programming Language, health services

# AN OUTLIER DETECTION METHOD FOR BALANCED REPLICATED LINEAR FUNCTIONAL RELATIONSHIP MODEL

*Azuraini Mohd Arif\*, Yong Zulina Zubairi, Abdul Ghapor Hussin*

## **Abstract:**

Balanced replicated linear functional relationship model (LFRM) is a type of regression model where variables involved are measured with error and by using this model, the unidentifiable problem in estimating the parameters of LFRM can be solved. However, the presence of outliers in dataset, adversely affect the parameter estimation; thus, making it important to have an approach to identify such outliers. Based on the idea of COVRATIO statistic, we modify the procedure to ensure it works well with replicated linear functional relationship model (LFRM) in detecting the outlier. In this model, we assumed the symmetry of the observations in each group. A simulation study is used to obtain the cut-off point and also the power performance of the COVRATIO statistic. Preliminary results suggest that the power of performance for detecting the outlier increases as the error variance decreased. An illustration of this procedure is presented for its potential in practical use for real data sets.

**Keywords:** errors-in-variable model; outliers; COVRATIO Statistic

# UiTM HAPPINESS INDEX MODEL (UHI): METHODS, ANALYTICS AND CHALLENGES

*Mohd Azraai Kassim, Abdul Rahman Omar, Zamalia Mahmud\*, Abdul Kadir Othman, Norlida Jaafar, Aidawati Zainan Abidin, Shereen Noranee, Idaya Husna, Nazlinda Abdullah, Nor Hafizah Ibrahim, Zainura Idrus*

## **Abstract:**

The UiTM Happiness Index study was first conducted in 2017 for the purpose of measuring happiness among 17,706 UiTM staff. Upon sensing that happiness could relate to good productivity and performance, the UiTM Happiness Index team was formed in 2016 and began the journey of searching for the right model and instrument to measure happiness of UiTM staff. However, developing the right model and instrument to measure happiness is critical as they must be relevant to the context and setting of the institution. Hence, collecting data and measuring the happiness of UiTM staff in 13 branch campuses and 24 faculties comes with a big challenge. The formation process of UHI PERMAIg model and the instrument shall be described. The focus group interview via Kansei method and Quadrant analysis in the instrument development will be illustrated. This led to the construction of 135 items across 6 PERMAI domains and 8 sub-domains acquired through EFA while item responses were subjected to a Cronbach's Alpha. Survey responses were collected using face-to-face mode in 2017 and online mode via Survey Monkey® in 2018. Data was captured in Excel and exported to SPSS data base in order to execute the necessary analytics. Power BI was used to create quick dashboards where DAX queries are used to map data and produce interactive output for easy viewing. The highlights of UHI data analytics include the computations of happiness index, distribution of happiness index, profiles of respondents and comparison of happiness index between the branch campuses and faculties.

**Keywords:** PERMAIg Model, Positive Emotion, Engagement, Accomplishment, Infrastructure



# PARALLEL SESSION 2



# RISK CHARACTERISTICS OF AGGREGATE DISCOUNTED CLAIMS WITH COPULA DEPENDENT WEIBULL INTER-WAITING TIME

*Sharifah Farah binti Syed Yusoff Alhabshi\*, Siti Norafidah binti Mohd Ramli, Zamira Hasanah Zamzur*

## **Abstract:**

The restrictive assumption of equidispersion in the widely used Poisson count process may no longer be valid in claims modeling if the claims occurrence exhibit dispersion across the datasets. It is also essential to capture the dependence structure between the inter-waiting time and the subsequent claims amount which was sometimes ignored in past studies. Hence, this paper will consider the aggregate discounted claims of an insurance risk portfolio under the Weibull counting process to allow for overdispersed and underdispersed datasets, and a Farlie-Gumbel-Morgenstern copula will be used to define the dependence structure between the pair of associated variables. Using the Monte Carlo simulations, we obtain the central moments of the Weibull risk portfolio and compare our output with values computed previously under the Laplace transform and the Neumann series for confirmation purposes. We then calculate the respective premiums as well as the value-at-risk of the insurance portfolio. The simulation outcome under an overdispersed dataset with a negative dependence structure indicates the highest value of mean and variance in comparison to an equidispersed and an underdispersed scenario. Both risk processes under the Weibull and Poisson count process are significantly skewed to the right with high kurtosis, with the overdispersed case being more skewed with thicker tails in comparison to the other two cases of dispersion. This characteristic then leads to a higher premium charged and value-at-risk amount, indicating that insurers should continually monitor its pricing strategies and the capital requirement to accommodate higher risk level under an overdispersed dataset.

**Keywords:** Simulation, Farlie-Gumbel-Morgenstern copula, Overdispersed counting process

# **TODA-YAMAMOTO CAUSAL ANALYSIS BETWEEN HEALTH AND ECONOMY: EVIDENCE FROM MALAYSIA**

*Dr. Wong Sing Yun\*, Dr. Jain Yassin*

## **Abstract:**

The recent spread of the COVID-19 pandemic had disrupted global economic activities, putting halt to most production and posed a damaging effect on the macroeconomy. Motivated by the worrying economy repercussion from this novel pandemic, this paper will attempt to examine the health impact on Malaysia's economy by employing the Toda-Yamamoto Causality approach. This study will cover the period of 1971 to 2018 and will seek to trace the existence of any causal relationship between health and the selected economic indicators. In addition, this paper will evaluate the income-health relationship in determining empirically whether this hypothesis is likely to hold in Malaysia. Empirical evidence from this paper highlighted a bi-directional causality between life expectancy and economic growth. This implied that the state of health is likely to affect the economy. The findings from this study will be useful to policy-makers as it provides additional insights into the relationship between economic changes and health indicator.

**Keywords:** Life – Expectancy, Economic Growth, Health Status, Granger Causal

# HOW MUCH EARNINGS LOSS FOR BEING ENDED IN OVERQUALIFIED JOBS? EVIDENCE FROM SALARY AND WAGE SURVEY, 2010 - 2016

*Zainizam bin Zakariya \*, Nur Kalsom binti Mohd. Isa*

## **Abstract:**

This paperwork explores earnings penalty for being ended up in overqualification jobs among workers. For this, Salary and Wage Survey (SWS) dataset across 2010, 2013 and 2016 was employed. The SWS measured overqualification using the modal and job analyst approach. Approximately, between 14% and 19% of the total employed persons in the SWS were classified as being overqualified in their jobs but the majority were in jobs that corresponded to their actual qualifications. Regardless of method, the incidence was higher among females while males were overrepresented in the underqualification jobs. The incidence was higher among the Malay than other ethnic groups. Across state, overqualification was more than twice the average level in WP. KL than elsewhere. There was considerable evidence that overqualification resulted in earnings loss, between -13% and -21%. The pay loss was higher for the job analyst than the mode method. The loss was greater for the overqualified women than the overqualified men counterparts. The earnings penalty was observed across all states, ranges from -5 to -23% for the mode and between -14% and -27% for the job analyst approach. Overqualified workers from Perlis and Kelantan experienced the highest earnings loss regardless of approach. The results imply that being ended up in overqualified jobs may lead to lower workers' own productivity in terms of earnings loss. It's a very useful if a series of overqualification measurements is embedded in the survey to estimate true impacts of the incidence and outcomes of the mismatch in the Malaysian labour market.

**Keywords:** Malaysia, overqualification, earnings penalty, state, gender

# IF YUAN SNEEZE, WILL RINGGIT MALAYSIA BE AFFECTED?

*Wan Rahifah Wan Ramli\*, Siti Norfadillah Md Saat, Zainuddin Ahmad*

## **Abstract:**

Malaysia is an open economy. In 1970, Malaysia total trade contributed 86.88 per cent to Malaysia Gross Domestic Product, while it jumped to 123.09 per cent in 2019. International trade is very important to Malaysia. One of important consideration in doing international business is currency exchange rate. An appreciation in exchange rate will result in export become expensive, and vice versa. A higher exchange rate can also worsen a country's balance of trade. Consumers monitor exchange rate because it can affect consumption price. Companies can lose millions of dollars due to volatility of exchange rate. Central Bank observe exchange rate because it is one of factor determining Overnight Policy Rate which will influence interest rate in Malaysia. There are many factors that can influence exchange rate; one of it is world major currencies. Acknowledging the importance of the exchange rate, this paper would like, for the beginning, to investigate relationship between Malaysia currency i.e. Ringgit Malaysia (RM) with other major currencies. We will study against U.S. Dollar, European Euro, British Pound, Chinese Yuan, and Japanese Yen. How far changes in other major currencies will give impact to RM? Depending on the unit root test result, specific vector autoregressive analysis test will be applied. In this study, Impulse Response Function and Variance Decomposition Analysis will also be used to have in-depth insight on the relationship.

**Keywords:** Exchange rate; currency; Ringgit Malaysia

# MALAYSIA'S RESPONSE AND ACTION TO THE LABOUR MARKET SITUATION FROM THE IMPACT OF ECONOMIC CRISIS

*Solihuddin Shah Rizuan\*, Muhammad Shafiq Harun, Nurfarahin Harun*

## **Abstract:**

Global economic has been influenced by the extraordinary crisis, known as novel Coronavirus (COVID-19). The outbreak of COVID-19 has disturbed the Chinese economy and is spreading all around the world, and Malaysia is no exemption. Commonly Malaysia economic industry were heavily depending on labour which influenced the labour market situation. This study aims to discuss the effect of Malaysia's economy to the workers and the initiatives to response & learn from the crisis happens in Malaysia. This crisis give impact on the unemployment rate and some organization decided that the salary of worker ought to be cut. This study used Malaysia economic indicators published by Department of Statistics Malaysia (DOSM). In second quarter of 2020, DOSM reported that the national gross domestic product (GDP) plunge to 17.1 per cent which lead to the impact on the unemployment rate, recorded an increase to 5.1 per cent. As a whole, labour utilization which was one of the factors of production in the economy as yet to reach the optimum level as business operations begun to resume gradually.

**Keywords:** economic, crisis, stimulus packages, employment

# THE CHALLENGES AND SOLUTIONS OF SUSTAINABLE DEVELOPMENT GOALS (SDG) DATA COORDINATION AND INTEGRATION IN MALAYSIA

*Nur- 'Azah Afnan binti Hanafi\*, Nur Ezzati binti Abdul Hamid , Mohd Amin bin Ishak, Zaidatul Azreen binti Zulkiple*

## **Abstract:**

The Department of Statistics Malaysia (DOSM) is a premier government agency under the Prime Minister's Department entrusted with the responsibility to collect, interpret and disseminate latest and real time statistics in the monitoring of national economic performance and social development. DOSM has been appointed as a focal point in the coordination of the development of SDG indicators that focuses on Malaysia's social, environmental and economic development. In October 2019, DOSM has published the first SDG Indicators publication which consists of 99 readily available indicators. Out of 99 readily available indicators, 67.7% are from other ministries/agencies and the rest 32.3% are from DOSM. As the progress in achieving the Sustainable Development Goals (SDGs) for Malaysia, DOSM realized the biggest challenge faced by a country lies in identifying the data gaps. A comprehensive course of actions needs to be taken to reduce the data gap toward achieving 2030 Agenda. This paper will focus primarily on issues and challenges relating to the coordination and integration of SDG indicators as well as the solutions. The solutions will elaborate on how SDGs provide a perfect example of why a coordinated and integrated statistical system is important to ensure the achievement of 2030 Agenda.

**Keywords:** Sustainable Development Goals, SDG Indicators, Data Gaps

# DETERMINANTS OF MALAYSIA'S EXPORTS OF PERSONAL PROTECTIVE EQUIPMENT

*Lee Siu Ming*

## **Abstract:**

Malaysia is the world's largest, and Association of Southeast Asian Nations' second largest, exporter of personal protective equipment (PPE), commanding more than 10% of global market share. This study examines the determinants of Malaysia's PPE exports using an augmented gravity model for the period of 1989-2019 to the top 20 export destinations (about 87% of total exports). The empirical technique employed is panel data analysis fixed effect model. A total of 15 6-digit Harmonised System codes are compiled to identify PPE required during pandemic influenza period. The empirical results show that exporter's Gross Domestic Product (GDP), importing countries GDP and dummy variable of high-income importers are significant determinants of Malaysia's PPE export. Meanwhile, the dummy variable of years during influenza pandemic as categorized by World Health Organisation (WHO) is not a significant determinant for Malaysia's PPE export. Analysis of PPE export determinants allows policymakers and industry members to make more well-informed decisions on longer-term production and trade, rather than effects of short-term occurrences.

**Keywords:** gravity model, medical devices, panel data, trade

# **DETERMINANTS AND CHANGES OF LABOUR FORCE PARTICIPATION IN MALAYSIA: A CASE STUDY ON GENDER PERSPECTIVE IN YEARS 2011 -2016**

*Lim Bao Man\*, Nuzlinda Abdul Rahman*

## **Abstract:**

Labour Force Participation rate is always a concern in economic view in Malaysia. The main objective of this research is to study how the labour force factors will affect the labour force participation rate (LFPR) for each state in Malaysia from the year 2011 to 2016. Static Panel data analysis is used in this study, such as Pooled Ordinary Least Square (POLS), Random effect model (REM) and Fixed effect model (FEM) are applied to determine the relationship between the determinant variables and the labour participation rate for each state in Malaysia according to gender differences. FEM is used to investigate the relationship between determinants of labour force and male labour force participation rate. The model shows outside labour force, non-married, secondary and tertiary education level have inverse relationship with male labour force participation rates. While the marital status has the positive relationship between male labour force participation rates. Next, the effect of determinants and characteristics of labour force on female labour force participation rate, REM is used. The model shows that unemployed, widowed status, outside labour force and marital status have an inverse relationship with female labour force participation rates. Meanwhile, non-formal education level, tertiary education level and age group between 40-64 have positive relationship with female labour force participation rates. In conclusion, it is important to understand the LFPR according to gender for each state of Malaysia because it will shape the comparative advantage and situation of Malaysia Labour Market.

**Keywords:** Panel Data Analysis, Fixed Effect Model, Random Effect Model





# POSTERS

# MODERNISATION OF DATA COLLECTION AND DISSEMINATION DURING PANDEMIC

*Siti Nurliza Samsudin\*, Siti Aisyah Afifah Azman, Nur Azreen Mokhyi,  
Noor Amirah Othman*

## **Abstract:**

In 2020, the world faced the COVID-19 pandemic and governments across the world were forced to conduct lockdowns in their countries. In such unprecedented times, the role of statistics is undeniably critical to make fast decisions among policymakers, especially for policies related to health, fiscal and monetary. However, data collection which had always been manual, had made compilation of statistics difficult particularly during a crisis. Hence, this paper discusses modernisation techniques to digitalise and to automate data collection to prepare for future crises. In particular, the techniques involve uses big data analytics instead of traditional data sources, as well as the challenges involved. In addition, the type of data and data limitations are also elaborated in this paper. Finally, this paper also discusses the possible modernised techniques and tools to disseminate data.

**Keywords:** Modernisation, pandemic crisis, digitalise, big data

# THE DETECTION OF HIGH LEVERAGE POINTS USING SUPPORT VECTOR REGRESSION

*Abdullah\*, Habshah Midi*

## **Abstract:**

High Leverage Point (HLP) refers to outlying observation in the X-direction. It is often occurs in high dimensional data (HDD) where the number of parameters is much larger than sample size. It is very imperative to detect HLPs before further analysis is done on the data to avoid misleading conclusion because HLPs give a bad effect on the values of various estimates. Many methods of detection of HLPs are available in the literatures, but most of them only deal with low dimensional data. In this paper, we will employ a non-parametric approach of identifying HLPs in HDD based on Nu-Support Vector Regression. The usefulness of our proposed method of detection of HLPs in HDD is studied by real data sets and simulation study.

**Keywords:** outliers, robustness, statistical learning theory, support vector regression

# OUTLIER DETECTION METHOD FOR CIRCULAR DATA WITH ERROR-IN-VARIABLES MODEL

*Nurkhairany A. Mokhtar\*, Mohd I. Shamsudheen, Yong Z. Zubairi,  
Abdul G. Hussin*

## **Abstract:**

An outlier is an observation that deviates from the other findings so much as to raise suspicions. This study discusses a method of outlier detection for circular data with Error-in-Variables Model where the error terms are considered in each variable. Here, we propose a trigonometric function called functional difference mean circular error cosine with row deletion approach in detecting outliers. With 95% significance level, the cut-off equation is developed through a simulation study for outlier detection. The power of performance of the proposed method is evaluated where outlier is planted in the generated data. Results show that the performance of the method increases as the level of contamination and the concentration parameters increase. Application in real data illustrates the applicability of this method in detecting outlier.

**Keywords:** simulation study, row deletion, power of performance, trigonometric function, functional model

# THE RELATIVE EFFICIENCY OF DOMESTIC AIRPORTS IN MALAYSIA: AN APPLICATION OF DATA ENVELOPMENT ANALYSIS

*Ida Nazirah Binti Jiwarah\*, Nor Aisyah Binti Abdul Halim*

## **Abstract:**

Airline industries are one of the most important factors in fostering economic productivity within any given region. They serve as best transport service in every term and give the most efficient mode of transportation. Malaysia Airports Holding Berhad (MAHB) used the concept of Key Performance Indicators (KPIs) to measure the airports' efficiency, however it does not capture the whole nature of the airports' production process. Hence, Data Envelopment Analysis (DEA) is employed in this study as a suggestion to measure the performance of Malaysia's airports. This study deals with evaluating Malaysia's domestic airports in terms of their technical efficiency. The objectives of this study are to measure the efficiency of Malaysia's domestic airports, to determine the efficient and inefficient airports and suggest the values that need to be increased by inefficient airports to reach efficient. The annual reports for year 2016 to 2019 retrieved from MAHB served as the main source of data for this study. Runway length and airport's area were selected as inputs meanwhile total number of passengers, total amount of cargo and total commercial aircraft movements were selected as outputs. To achieve the objectives of this study, output-oriented DEA, CCR model has been applied and DEA Solver has been used as tools to obtain the efficiency score. The results show that 4 out of 16 domestic airports in Malaysia have been identified that they are able to efficiently produce the maximum amount of outputs by using the available amount of inputs from year 2016 to 2019.

**Keywords:** Airlines, DEA, Performances, Inputs, Outputs

# EMOTIONAL STABILITY AND PRIORITIES OF MALAYSIANS DURING COVID-19'S INITIAL MOVEMENT CONTROL ORDER

*Zamalia Mahmud, Rosli Abdul Rahim, Aidawati Zainan Abidin\*, Nik Nairan Abdullah*

## **Abstract:**

The Movement Control Order (MCO) due to Covid-19 pandemic in Malaysia has brought people's life to almost a standstill. How citizens across different ages and income groups were emotionally adjusting to the unprecedented situation in Malaysia has been documented in a 2-week real-time survey upon 3,288 Malaysian citizens. These people were totally locked down at home for about 95% of their time during the initial 2-week of MCO. The aims of the study was to examine the emotional stability of Malaysians and to find out what their priorities are during two weeks of MCO. A questionnaire was developed in Google Form format and administered to the public via email and Instant Messaging (Whatsapp and Telegram) using convenience and snow ball sampling techniques. The study has revealed an unprecedented real-time encounter of COVID-19 pandemic by Malaysians across different ages and income groups based on the emotional stability index and exploratory statistics. All these results shall be revealed during the presentation at MyStats 2020.

**Keywords:** Covid-19 pandemic, age, income, emotion, health

# TOWARDS ECONOMIC WELLBEING OF THE NATION: CONCEPTUAL FRAMEWORK OF GDP BY DISTRICT

*Siti Hajar Mohamad\*, Ainil Zafirah Abd Karim, Syazwani Aliah Abd Rahman*

## **Abstract:**

The government through Shared Prosperity Vision 2030 (SPV 2030) has introduced the Key Economic Growth Activities (KEGA) to address the imbalances and disparities in the economic development of states and regions as well as urban and rural areas. The need for micro-level data became vital in measuring the performance of economic developments at the small geographic region. According to the Bureau of Economic Analysis (BEA), U.S Department of Commerce, Gross Domestic Product (GDP) by metropolitan area will be able to provide an overview of economic distribution by region (Ledia Guci, 2016). Hence, this encourages the study to establish a GDP profile at the district level in Malaysia. This paper provides an introduction to the concept and methodology used in developing the GDP by districts based on the production approach. Moving forward, the outcome of this study will be further used to estimate GDP at economic corridor as well as local authorities and main cities. The indicators obtained by small geographical areas would make it possible for the policy to formulate a more balanced socioeconomic growth and further encouraged Malaysia to become a prosperous and inclusive country in the future. Based on this study, the district which contributes to the state and national economy can be identified, as well as the economic activity which propelled the district and state performance. Ultimately, the economic wellbeing and income equality between districts can be observed in order to provide the comprehensive information in determining the economic level of the districts.

**Keywords:** GDP, imbalance, socioeconomic, micro statistics

# IMPACT COVID-19 TO UNEMPLOYMENT RATE OF YOUTH IN MALAYSIA

*Nur Zurianty Hariza Che Pak\*, Nur Adila Daud, Nurhaniza Mohd*

## **Abstract:**

This paper describes and discusses the impact and implication on people and economy caused by the spreading of the COVID-19 pandemic in Malaysia. COVID-19 continues to slow down Malaysia's economy, and this may have severe impacts. This study is focused on the impact of COVID-19 on Malaysia's unemployment rate of youth based on the findings of Quarterly Labour Force Survey Report published by Department of Statistics Malaysia. The unemployment rate of youth is always higher than the overall and adult. The unemployment rate for youth aged 15 to 24 years increased 1.5 percentage points to 12.5 per cent in Q2 2020 (Q1 2020: 11.0%). The youth who transitioning from education to labour market will find it more hardly to find jobs mainly at the entry level due to increased competition for employment, lack of working experiences as well as declining job availability or labour demand. The competition will be more intense as they have to fight it not only with other young candidates, but also with job seekers who have been laid off due to the crisis and they had working experiences as well.

**Keywords:** unemployment, youth, COVID-19



# STUDY ON SCHEDULED WASTE MANAGEMENT EXPENDITURE BY ESTABLISHMENTS 2017

*Nazira Abdullah\*, Ismail Abdul Rahman, Mahadi Mohd Nor,  
Siti Zakiah Muhamad Isa*

## **Abstract:**

This paper aims to identify the significant factors that contribute to establishment's tendency to have an allocation for scheduled waste management expenditure. The dataset for this study was obtained from the Environmental Protection Expenditure Survey conducted in 2018 for the reference year of 2017. A logistic regression model was constructed to with four predictors which are number of employees, gross annual income, environmental certification attainment and paid penalty due to environmental damage. The simulation results show that gross annual income and environmental certification attainment contribute towards the probability of an establishment to spend on the scheduled waste management cost whereby one billion increase in gross annual income increase the probability of an establishment to spend on waste management by 2.4 times. Other than that, establishments with environmental certification attainment are 5.6 times more likely to spend on scheduled waste management cost compared to the establishment without the certification. The obtained model is showing 68.1% classification accuracy which is higher than the by chance accuracy and supports the assumption that there exist relationship between the independent variables and the dependent variable. Besides, the 80:20 cross-validation analysis further supports the full model classification accuracy since the criteria to have the hold out classification accuracy more than 61.02 per cent.

**Keywords:** Environment, environmental protection, environmental protection expenditure, logistic regression

# IMPACT OF MALAYSIAN FISCAL STIMULUS PACKAGE ON THE ECONOMY : AN INPUT-OUTPUT ANALYSIS

*Rusnani binti Hussin@Isa\*, Intan Nazira binti Mohd Idris, Mohd Azam Aidil bin Abd. Aziz, Nurul Naqiah binti Mansor*

## **Abstract:**

The world is plagued with a COVID-19 outbreak that is affecting the economy of all countries including Malaysia. This paper aims to study the impact of the fiscal stimulus package introduced by the Malaysian government to value-added. An Input-Output (IO) analysis is adopted in this study. The IO table makes it possible to analyse sectorial linkages within the economy in a particular period and allows us to have a clear understanding of the relationship between final demand, output and income. In this study, the allocation of Fiscal Stimulus Package by initiative is obtained from the PRIHATIN booklet published by the Ministry of Finance. However, due to limited information on the detailed disbursement of the stimulus package, the distribution of the fund is according to the industry structure based on the IO table. This study found that the injection of RM32.9 billion of Economic Stimulus Package in the economy is expected to induce a value-added of RM21.5 billion based on the assumption that 100 per cent of the stimulus package is going back to the economy in the form of expenses and production. Manufacturing sector receives the highest fiscal stimulus package with RM19.2 billion. This paper also discussed on backward and forward linkages where Manufacturing is the key sector that plays an important role in supporting the growth of other sectors.

**Keywords:** COVID-19, stimulus package, key-sector, linkages

# **PANEL COINTEGRATION: THE LONG-RUN RELATIONSHIP BETWEEN AGRICULTURE PRODUCTION, POLLUTION EMISSIONS AND ECONOMIC GROWTH FROM ASEAN PERSPECTIVE**

*Shairil Izwan Taasim\*, Adrian Daud*

## **Abstract:**

The rapid increase in population worldwide is causing large scale of production of agricultural products and increased preparation of plants, livestock, vegetables and much more agricultural items for people's use and food security. The implications from this is that ASEAN, especially, invests in technology for large scale production for a sustainable environment. By applying the panel data analysis technique Fully Modified OLS and Dynamic OLS, this paper investigates the causal relationship between agricultural production, pollution emissions and Gross Domestic Product (GDP) among ASEAN countries. The paper results show the variable has a long-run and short-run relationship with a positive value. While in a developing country, investment in an agricultural product based on sustainable agriculture that meets present food requirements without affecting the environment should be considered as an alternative for the benefit of future generations.

**Keywords:** agriculture, panel data, ASEAN, Food Security

# INEQUALITY PATTERN IN MALAYSIA: DOES THE DISPARITY MITIGATED AFTER THE 50TH YEARS OF THE NEW ECONOMIC POLICY?

*Muhamad Hilmi bin Abdul Rahman\*, Azmah binti Othman,  
Yong Zulina binti Zubairi*

## **Abstract:**

Malaysia has recorded a successful story in reducing absolute poverty from 49 percent in 1970 to 5.6 percent in 2019. The New Economic Policy 1970-1991 is seen as a driver of restructuring society followed by the other two key policies such as the National Development Policy 1991-2001 and the National Vision Policy 2001-2010, which specifically focused on nation building, economic growth, and ethnic inequality. Thenceforth, the government continued the initiative of compiling a socio-economic data that relevant to poverty and inequality. After a fifty years of the New Economic Policy, it is important to use the historical data to understand better the socio-economic issues in a more meaningful way; in particular on inequality. This paper descriptively present how inequality pattern evolves in Malaysia after the racial riots in 1969. Two concerns are emphasised, first, reducing poverty and raising inequality, second, raising income inequality and ethnic disparity. Affirmative action programme established by the government has improved not only the Malays' household incomes, but other races are better off both socially and economically. Incidence of poverty between strata and ethnicities also declined over the years with the refinement of income across income groups, which sizeably reduced the proportion of poor households and addressing inequality. Hence, the motivation of this study to utilise the available historical data from various sources to provide a base image of social and economic inequality in Malaysia. Implications of the study provide insights to policymakers when formulating a targeted-based policy.

**Keywords:** Historical data, Descriptive analysis, Economic inequality, Social inequality

# MODELLING EXTREME PRECIPITATION EVENTS USING CIRCULAR STATISTICAL APPROACH

*Aida Adha Mohd Jamil\*, Rossita Mohamad Yunus, Yong Zulina Zubairi*

## **Abstract:**

Rainfall models are useful to explore the trends of rainfall and to predict the future outcomes. Circular variables measured in degrees or radians, are useful in understanding the timing of extreme precipitation events. Thus, to evaluate the influence of the southwest and northeast monsoon, the total amount greater than 60mm of rainfall per day from 2008 until 2014 for two stations; Bayan Lepas in West Coast region, Muazam Shah in East Coast region, Malaysia have been analysed. The process of performing initial studies on data by generating circular plots, and computing hypothesis tests and the circular correlation coefficient were conducted when analysing circular data. Herein, the von Mises distribution is used to fit Malaysian extreme precipitation amounts in the two stations, with extreme precipitation calendar date (in the angular form) as the predictor of the models. The residual plot will be used for diagnostic checking and model comparison is performed using the Likelihood Ratio Testing (LRT) and the Akaike Information Criterion (AIC) statistic. The results show the models are useful in highlighting the latest trends and projections of climate change in Malaysia.

**Keywords:** circular statistical, von Mises distribution, rainfall modelling

# APPLICATION OF COMBINED DATA MART FOR INFORMATION ACQUISITION OPTIMIZATION

*Hafizah Mansor\*, Choong-Yeun Liong, Mohd Khadzir Sheikh Ahmad*

## **Abstract:**

Increasing data in the health sector has led to the implementation of data warehouse as a repository of data collection. The development of data mart as a subset in data warehouse for every service in health sector acted as a medium between user and data warehouse in transmitting of information required for analysis and reporting purpose. Unfortunately, analysis from individual data mart limits the information acquisition. Therefore, a study to combine two data marts was conducted to gain new insights in analysis. The implementation of daycare services is given attention because it is seen to be able to reduce the workload and congestion of patients in the inpatient services. Thus, a study to combines both data mart of daycare services and inpatient services was implemented to see new insights and findings from both services. Dimensional model and star schemes approaches are applied in the combination of the two data marts. The combined data mart successfully listed the record and flow of treatment received by patients in both services.

**Keywords:** Descriptive analysis, Dimensional model, star scheme, inpatient services, daycare services



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