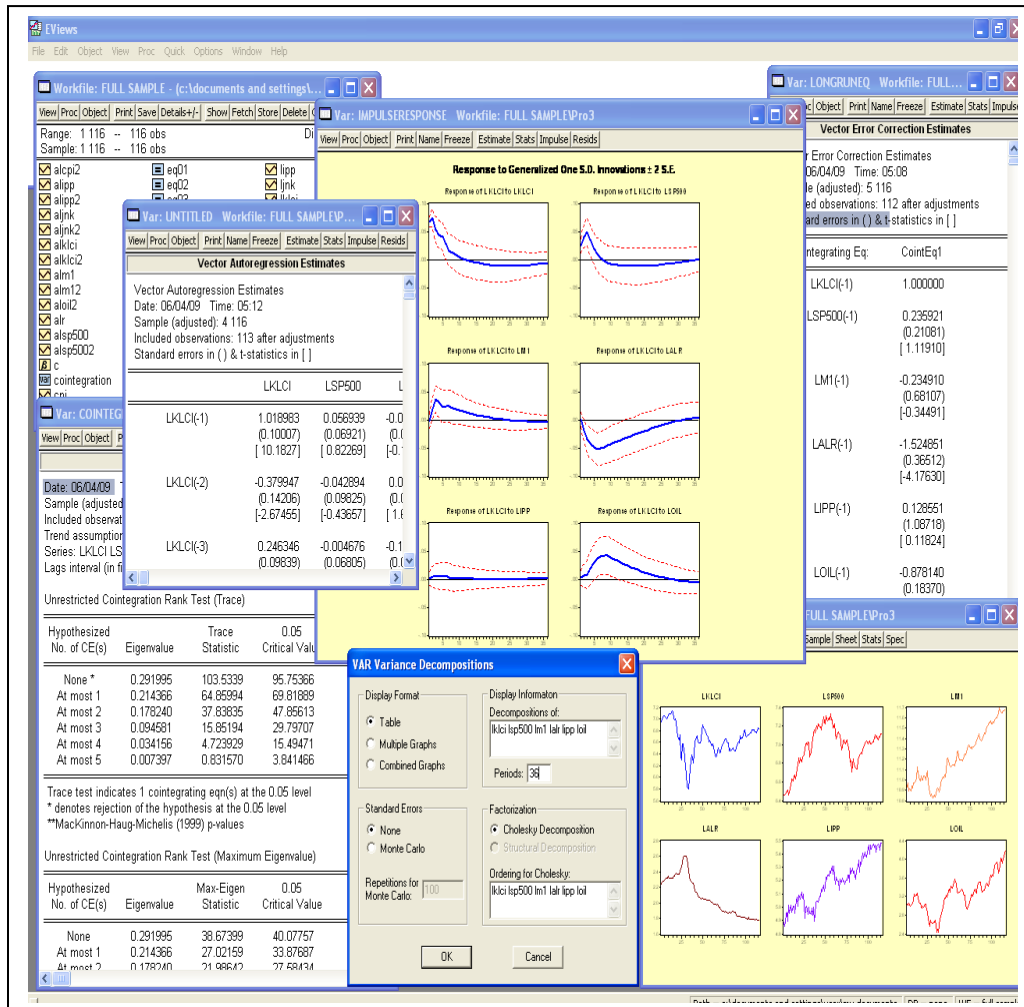


# ECONOMETRICS SHORT COURSES

## TIME SERIES DATA ANALYSIS

Universiti Sains Malaysia, Penang. Exact Venue to be Confirmed  
27 (Sat) & 28 (Sun) MARCH 2021



- ### COURSE CONTENTS
- #### VAR, VEC & ARDL MODELS
- ✓ Unit Root Test
  - ✓ JJ Cointegration Test
  - ✓ Granger Causality
  - ✓ Impulse Response
  - ✓ Variance Decomposition
  - ✓ ARDL Level Relation
  - ✓ Bound Test / EC Representation
- #### TIME SERIES DATA ANALYSIS
- ✓ White noise & Nonstationarity
  - ✓ Identifying ARMA/ARIMA Models
  - ✓ ACF & PACF, AIC & BIC
  - ✓ Residual Diagnostic/Overfitting
  - ✓ GARCH-type Models
  - ✓ Seasonal Model: SARIMA
  - ✓ Time Series Regression
  - ✓ Forecasting: RMSE, MAPE

### WHO SHOULD ATTEND

Academics and Graduate Students as well as Researchers, Analysts and Consultants in various business disciplines that may include Private & Public Sector Organizations, Regulatory Authorities, Banks & Financial Institutions.

**HANDS-ON & EXERCISE:**  
**MINITAB, SPSS & EViews**  
**FACILITATORS: Dr Zainudin (USM)**



# VAR, VEC & ARDL MODELS

Universiti Sains Malaysia, Penang. Exact Venue to be Confirmed  
10 (Sat) & 11 (Sun) APRIL 2021

# TIME SERIES DATA ANALYSIS

## DAY 1 : SATURDAY, 27 MARCH 2021

8:15 AM	REGISTRATION
8:45 AM	SESSION 1 – INTRODUCTION TO FUNDAMENTAL CONCEPTS <ul style="list-style-type: none"><li>▪ White noise processes; Autocorrelation and Partial Autocorrelation Functions (ACF &amp; PACF)</li></ul>
10:30 AM	TEA BREAK
10:45 AM	SESSION 2 – MODEL IDENTIFICATION <ul style="list-style-type: none"><li>▪ Autoregressive (AR), Moving Average (MA) and ARMA processes</li></ul>
12:45 PM	LUNCH
2:00 PM	SESSION 3 – PARAMETER ESTIMATION & MODEL DIAGNOSTICS <ul style="list-style-type: none"><li>▪ AIC &amp; BIC; Residual Analysis and Overfitting, ARCH-LM test</li></ul>
3:45 PM	TEA BREAK
4:00 PM	SESSION 4 – MORE ON ESTIMATING ARIMA MODEL & FORECASTING <ul style="list-style-type: none"><li>▪ More practices on developing ARIMA model, a look into Forecasting</li></ul>
5:30 PM	Q & A (SESSIONS 1 - 4)

## DAY 2 : SUNDAY, 28 MARCH 2021

8:30 AM	SESSION 5 – VOLATILITY MODELS <ul style="list-style-type: none"><li>▪ ARCH and GARCH models, EGARCH, GARCH-M, Half-life, Leverage Effect</li></ul>
10:30 AM	TEA BREAK
10:45 AM	SESSION 6 – TIME SERIES REGRESSION <ul style="list-style-type: none"><li>▪ Autocorrelation - Detection and Remedy, Durbin-Watson statistic</li></ul>
12:30 PM	LUNCH
1:45 PM	SESSION 7 – SEASONAL TIME SERIES <ul style="list-style-type: none"><li>▪ Identification, Estimation and Diagnostic Checking, Seasonal Lags</li></ul>
3:15 PM	TEA BREAK
3:30 PM	SESSION 8 – MORE ON VOLATILITY & SEASONAL TIME SERIES MODELS <ul style="list-style-type: none"><li>▪ More hands-on exercises on developing GARCH-type &amp; SARIMA models</li></ul>
5:00 PM	Q & A (followed by CERTIFICATE PRESENTATION at 5.30pm)

One of the most popular issues in economic and finance literature in the last quarter of century is that of cointegration. The **Vector Autoregressive (VAR)** model is a system of multiple time series, allowing the variables to influence each other. The presence of long-run relationship (cointegration) among the variables is investigated using the **Vector Error Correction (VEC)** form of the model using procedure developed by Johansen and Juselius (1990),

The **AUTOREGRESSIVE DISTRIBUTED LAG (ARDL)** modeling approach introduced by Pesaran and Shin (1999) has the advantage over the cointegration approach using Error Correction Model as the ARDL approach is still applicable when the variables are a mixture of  $I(0)$  and  $I(1)$ . The ARDL approach allows for different variables to have different optimal lags. Furthermore, the ARDL framework has superior properties over the ECM for the case of small sample.

### TIME SERIES: WHY SEPARATE DISCIPLINE?

Time Series data need special care and methods of analyzing due to its unique nature. Unlike most cross-sectional data, time series observations are not independent thus violating classical assumption of many statistical methods including regression. This nature of time series data presents particular problems not normally dealt in most other statistical techniques. The extent of the problems increases with financial time series which are normally trending and exhibit varying level of volatility. While **the primary focus of the Time Series course** is to introduce appropriate procedure for building and validating a time series model, the course also looks at technique to deal with trending financial data that invalidates the use of traditional OLS regression.

# VAR, VEC & ARDL MODELS

## DAY 1: SATURDAY, 10 APRIL 2021

8:15 AM	REGISTRATION
8:30 AM	SESSION 1 – UNIT ROOT TESTS <ul style="list-style-type: none"><li>Nonstationary series &amp; Order of Integration, Unit root tests: ADF, PP and KPSS</li></ul>
10:30 AM	TEA BREAK
10:45 AM	SESSION 2 – VAR MODEL & COINTEGRATION <ul style="list-style-type: none"><li>Lag-length Criteria: AIC, BIC, FPE; Johansen &amp; Juselius Trace and Maximum Eigenvalue tests</li></ul>
12:45 PM	LUNCH
2:00 PM	SESSION 3 – VECTOR ERROR CORRECTION MODEL <ul style="list-style-type: none"><li>Error Correction Term – Speed of Adjustment, Short-term Granger Causality</li></ul>
3:45 PM	TEA BREAK
4:00 PM	SESSION 4 – INNOVATION ACCOUNTING <ul style="list-style-type: none"><li>Ordering of Variables, Impulse Response Function,</li></ul>
5:45 PM	Q & A (Please note the late finish. This used to be a 3-day course!)

## DAY 2 : SUNDAY, 11 APRIL 2021

8:30 AM	SESSION 5 – MORE ON INNOVATION ACCOUNTING <ul style="list-style-type: none"><li>Variance Decomposition Analysis</li></ul>
10:30 AM	TEA BREAK
10:45 AM	SESSION 6 – ARDL COINTEGRATION <ul style="list-style-type: none"><li>ARDL Bounds Test: Uniform Lagged, Diagnostic Checks: LM and CUSUM tests</li></ul>
12:45 PM	LUNCH
2:00 PM	SESSION 7 – ARDL LEVEL RELATION <ul style="list-style-type: none"><li>General to Specific Procedure &amp; Diagnostics, Long-run Coefficients</li></ul>
3:45 PM	TEA BREAK
4:00 PM	SESSION 8 – RESTRICTED ERROR CORRECTION MODEL <ul style="list-style-type: none"><li>Short-run EC Representation, Speed of adjustment</li></ul>
5:45 PM	Q & A (Note the Late finish. CERTIFICATE PRESENTATION at 6.00pm)

For more information on content of courses and brochure, kindly contact:

Dr. Zainudin Arsad (013-515-9571 or [zainudin.arsad@usm.my](mailto:zainudin.arsad@usm.my)) or Ms. Noor Farhana Fazil ([nfarhana.stat17@gmail.com](mailto:nfarhana.stat17@gmail.com))

### Course Fee (including SST)

Time Series Analysis: **RM400** per participant (Group 3-6: RM360 per participant)  
VAR, VEC & ARDL: **RM400** per participant (Group 3-6: RM360 per participant)  
The fees cover course materials, luncheons and a Certificate of Attendance.

**Postgraduate student** : RM300 for EACH course, requires proof of status. (Group 3-6: RM270 per student)

### Accommodation

Recommended nearby hotel is U Hotel (RM175 - RM225, reservation at 04-658-1000, only 300m walk from USM). Alternatively, stay at Vistana Hotel (RM225 - RM350, reservation at 04-646-8000, 3km from USM, 10mins by taxi). Muslims can try to get a room at the USM Pusat Islam (only RM70 per night, limited rooms, enquiry at 04-653-3753).

**Dr Zainudin Arsad** is a senior lecturer at USM, obtaining his BSc. and PhD from the Dept. of Actuarial Mathematics & Statistics, Heriot-Watt University, UK. His areas of research are Time Series Analysis and Econometric Modeling with main interest in the Applications of Kalman Filter Technique in Financial Issues. He is also active in tourism research and this includes topics on Determinants of Tourism Demand and Attributes of Tourists Satisfaction Level. **Dr Zainudin has conducted more than 150 short courses since 2009.** He is frequently been invited to conduct an in-house training and these include among others at the Malaysia Palm Oil Board (MPOB), Malaysian Communications and Multimedia Commission (MCMC), IIUM, UiTM and Monash University.

# REGISTRATION FORM (Closing Date: 25 March & 8 April 2021)

## TIME SERIES ATA ANALYSIS (27 & 28 MARCH 2021)

## VAR, VEC & ARDL MODELS (10 & 11 APRIL 2021)

Please scan and email this registration form (together with a copy of LO/PO, if applicable) to :

**Noor Farhana Fazil:**

School of Mathematical Sciences, Universiti Sains Malaysia, 11800 USM PENANG.

Email : [nfarhana.stat17@gmail.com](mailto:nfarhana.stat17@gmail.com)

### NAME OF SHORT COURSE (Please TICKING appropriate Yes/No of choice of days to be attended)

Time Series Data Analysis (27 & 28 March 2021)		Yes		No
VAR, VEC & ARDL Models (10 & 11 April 2021)		Yes		No

Please register the following name/names: (Please use separate sheet, if required)

Item	Name	Designation
*1.		
Industry Sector:		
Company:		
Address:		
Postcode:		
*Primary Person:		*Mobile Phone:
*Telephone No.:	*Fax No.	*E-mail:

"I hereby agree that the personal data that I have provided to USAINS, whether now or in future, may be used, recorded, stored, disclosed, or otherwise processed by or on behalf of USAINS in accordance with the Personal Data Protection Act 2010 and USAINS' data protection policy (available at USAINS' website - [www.usainsgroup.com](http://www.usainsgroup.com)), for the purpose of facilitation and organisation of this event, research and audit, and maintenance of a participant database for the promotion of this event, and such ancillary services as may be relevant."

### MODE OF PAYMENT

I enclose	<input type="checkbox"/>	Crossed Cheque	Number	Bank	No. of Participants:	
	<input type="checkbox"/>	Cash on Day			Postgraduate Student:	
	<input type="checkbox"/>	Bank Transfer			Group Discount:	
	<input type="checkbox"/>	LO/PO			Total Sum:	RM
	Payment must be made payable to 'Usains Holding Sdn. Bhd.'					

#### 1. Telegraphic Transfer. Please note the following:

Payee Name: Usains Holding Sdn. Bhd.

Details: Short Course on Time Series Data Analysis OR VAR, VEC & ARDL Models

Name of Bank: AmBank (M) Berhad, Level 21, Menara Dion, Jalan Sultan Ismail, 50250 Kuala Lumpur.

Account Number: 888 – 100 – 985 – 0380

Swift Code: ARBKMYKL

**(Please SCAN and EMAIL Bank-in Slip (write name & contact number) & Registration Form to [nfarhana.stat17@gmail.com](mailto:nfarhana.stat17@gmail.com))**

#### 2. Proof of Local Order (LO) or Purchase Order (PO) must be scanned/emailed to Dr. Zainudin/Ms. Noor Farhana for confirmation and secure of place, and it must be presented during morning registration.

The organiser reserves the right to refrain a registered participant from taking part in the event if no proof of payment can be presented. This only applies to registered participants who have NOT paid the registration fee PRIOR to the event date.

### Cancellation / Substitution

Cancellation must be made in writing through fax, e-mail or post **at least 10 working days** before the course. No refunds are available after this period. In the case of cancellation, **an administration charge of RM150** will be applied. However, substitute participants are welcomed at no extra charge provided written notice is given to the organizer at **least 5 working days** before the event.

Date:	Company's Official Stamp
Signature:	