SEMESTER 2 2020/21

UNIVERSITY OF Southampton
Faculty of Social Sciences

COURSEWORK BRIEF:

Module Code:	MANG6297	**Assessment:**	Individual Coursework	**Weighting**:	100
Module Title:	Advanced Time Series Modelling				
Module Leader:	Tapas Mishra				
Submission Due Date: @ 16:00	14 May 2021			**Word Count:**	3000
Method of Submission:	Electronic via Blackboard Turnitin **ONLY** **(You are not required to submit a hard copy)** **(Please ensure that your name does not appear on any part of your work)**				

Any work submitted after 16:00 on the deadline date will be subject to the standard University late penalties (see below), unless an extension has been granted, in writing by the Senior Tutor, in advance of the deadline.

University Working Days Late:	**Mark:**
1	(final agreed mark) * 0.9
2	(final agreed mark) * 0.8
3	(final agreed mark) * 0.7
4	(final agreed mark) * 0.6
5	(final agreed mark) * 0.5
More than 5	**0**

This assessment relates to the following module learning outcomes:

A. Knowledge and Understanding	A2. forecasting of financial time series A3. competence in using an econometric software package (STATA)
B. Subject Specific Intellectual and Research Skills	B2. evaluate model fit B3. assess out-of-sample properties B5. relate forecasts to strategic decisions B6. critically evaluate statistical models and forecasting tools
C. Transferable and Generic Skills	C1. analyse financial data C2. develop quantitative models

Coursework Brief: ***You must be aware that only you share responsibility for any academic integrity breaches or other issues that may arise from your coursework submission.***

Rubric

I do expect tables / graphs / diagrams in this assignment (embedded in the main text). Each table, graph or diagram will count as 25 words. Any table/graph must be explained contextualising the results to the context of the question. Remember that the graphs and tables you present are properly contextualised and form an important aspect of our explanations. Additional graphs and tables can be put in the appendix as well as the output from any statistical software you have used for the analysis.

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There are TWO compulsory questions for this Assignment.

Question One

Background information for Question One

In Question One, we have provided cross-market time series data for Bitcoin (one of the popular cryptocurrencies floating in the market). The Bitcoin is traded in various currencies, such as in Euros, USD, Korea, etc. The data have been collected from Coincheck (one of the platforms that provides aggregate price data for Bitcoin). In the Blackboard site of the course (see Assignment folder), we have included Bitcoin price data for six exchange markets (Europe, USA, Australia, Korea, Japan, Indonesia).

You can choose **ANY** file(s) depending on your interest. Eviews, Stata, R, Python or other any econometric software may be used for empirical estimation purpose.

Tasks for Question One

(1) By plotting the selected Bitcoin price series, explain if you find any 'trend' in the price behaviour. Use Hodrick-Prescott (H-P) Filtering Technique and Hamilton Filtering Techniques respectively to extract the 'cycles' from the 'trends'. Plot the Autocorrelation Function and comment on the persistence behaviour of the series.

(2) Test for (non-)stationarity in the selected series by using Augmented Dickey-Fuller, Phillips-Perron, and KPSS tests. Use options of intercept with and without trend term to compare your results. What implications do the 'presence or absence of a unit root' imply for the selected Bitcoin price regarding 'weak, strong, semi-strong efficiency' of the Bitcoin market?

(3) Assume that the Bitcoin series you selected is neither I(1) nor I(0). Then what would an I(d) with $0<d<1$ assumption imply for the Bitcoin market with respect to Efficient Market Hypothesis?

(4) Use any THREE Bitcoin prices from the list and find if there is any error-correction mechanism at work among them. Describe in detail, with regard to these specific selected series, a 3-variables cointegration and Vector Error Correction system.

[50 marks]

Question Two

Background information for Question Two

Topics

Your task is to test a hypothesis (see topics below). You need to discuss the following steps:

(1) data collection (e.g. method of sampling, data sources, selection criteria);

(2) definition of variables (e.g. control variables);

(3) model specification (e.g. Unit root, Cointegration framework; ARCH/GARCH models);

(4) interpretation of findings and conclusion.

To illustrate your empirical findings, you are expected to use tables and figures.

Recommended data sources: Datastream, Bankscope, FAME, Yahoo Finance

Please select one of the following topics / hypothesis.

***2.1*. Economic policy uncertainty is known to exert a statistically significant and negative impact on bond yields. This is consistent with the theory that investors tend to increase their demands in bonds during periods of higher economic or government policy uncertainty and thereby increasing bond prices and reducing their yields.**

HINT: You can examine the relationship between Economic Policy Uncertainty (EPU) of a country (see data here: https://www.policyuncertainty.com/) on future bond excess return across maturities and holding periods for the chosen markets.

You can collect bond data from the database of the US Treasury for the US data and the Bank of England for the UK data, for instance. The data of US government bonds are updated daily at website: https://www.treasury.gov/resource-center/data-chart-center/interest-rates. The data of UK government bonds are daily updated at website: https://www.bankofengland.co.uk/statistics/yield-curves.

You can try to use unit root tests (to identify non-stationarity) and cointegration methods to understand the nature of co-movement between the variables.

2.2. *Test the following hypothesis: "(Regional) housing prices depict strong spillover effects".*

HINT: You can calculate volatility in housing prices (within a country across regions or if you want across countries within a common economic union, such as Europe Economic Union). Try to use different types of GARCH models to estimate spillover effects (read literature).

[50 marks]

Nature of Assessment: This is a SUMMATIVE ASSESSMENT. See 'Weighting' section above for the percentage that this assignment counts towards your final module mark.

Word Limit: +/-10% either side of the word count (see above) is deemed to be acceptable. Any text that exceeds an additional 10% will not attract any marks. The relevant word count *includes* items such as cover page, executive summary, title page, table of contents, tables, figures, in-text citations and section headings, if used. The relevant word count *excludes* your list of references and any appendices at the end of your coursework submission.
You should always include the word count (from Microsoft Word, not Turnitin), at the end of your coursework submission, before your list of references.

Title/Cover Page: You must include a title/ cover page that includes: your Student ID, Module Code, Assignment Title, Word Count. This assignment will be marked anonymously, please ensure that your name does not appear on any part of your assignment.

References: You should use the Harvard style to reference your assignment. The library provide guidance on how to reference in the Harvard style and this is available from: http://library.soton.ac.uk/sash/referencing

Submission Deadline: Please note that the submission deadline for Southampton Business School is **16.00 for ALL assessments.**

Turnitin Submission: The assignment MUST be submitted electronically via Turnitin, which is accessed via the individual module on Blackboard. Further guidance on submitting assignments is available on the Blackboard support pages. Uploading files to Turnitin may take 30 seconds or more and you must give yourself plenty of time for the file to be uploaded by the assignment deadline.

You are allowed to test submit your assignment via Turnitin before the due date. You can use Turnitin to check your assignment for plagiarism before you submit your final version. See "Viewing Your Originality Report" for guidance. Please see the Module Leader/lecturer on your module if you would like advice on the Turnitin Originality report.

Late Penalties: Further information on penalties for work submitted after the deadline can be found here.

Special Considerations: If you believe that illness or other circumstances have adversely affected your academic performance, information regarding the regulations governing Special Considerations can be accessed via the Calendar: http://www.calendar.soton.ac.uk/sectionIV/special-considerations.html

Extension Requests: : Extension requests along with supporting evidence should be submitted to the Student Office as soon as possible before the submission date. Information regarding the regulations governing extension requests can be accessed via the Calendar: http://www.calendar.soton.ac.uk/sectionIV/special-considerations.html

Academic Integrity Policy: Please note that you can access Academic Integrity Guidance for Students via the Quality Handbook: http://www.southampton.ac.uk/quality/assessment/academic_integrity.page?. Please note any suspected cases of Academic Integrity will be notified to the Academic Integrity Officer for investigation.

Feedback: Southampton Business School is committed to providing feedback within 4 weeks (University working days). Once the marks are released and you have received your feedback, you can meet with your Module Leader / Module Lecturer / Personal Academic Tutor to discuss the feedback within 4 weeks from the release of marks date. Any additional arrangements for feedback are listed in the Module Profile.

Student Support: Study skills and language support for Southampton Business School students is available at: http://www.sbsaob.soton.ac.uk/study-skills-and-language-support/.

Further Information: Can be found in the Faculty of Business, Law and Art Handbook.