

Module Outline

STAT6091 – Index Numbers

4th – 8th April 2016

1. Aims of Module

The aim of the course is to provide participants with an understanding of the modern theory and practice of index numbers.

2. Learning Outcomes

By the end of course participants will be familiar with index numbers theory and methods and be able to provide practical solutions to general aggregation problems. They will understand the competing merits of different approaches to index number problems and methods for dealing with quality change.

3. Key Skills (Pre-Requisites/Required Background)

It will be assumed that you have a strong background linear algebra, differential calculus (including some basic familiarity with matrix differential calculus), Taylor series expansions and in regression modelling.

4. Lecturer(s)

Prof. Ian Crawford (University of Oxford, Nuffield College Oxford)

5. Workshop Assistance

N/A

6. Reading List (Key References)

Diewert, W.E. and Nakamura, A.O (eds.) (1993), *Essays in Index Number Theory, Volume 1*, Amsterdam: North Holland.

7. Teaching and Learning Methods

The course comprises a series of classroom lectures intertwined with individual study and computer lab sessions where the students are expected to put in practice some of what they have learned.

8. Lecture Programme, Timetable and Rooms

All course lectures and computer workshops will take place in the seminar room in building 39. Coffee and tea will be available during the breaks in the common room.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
10:15-11:15	Lecture Introduction	Class	Lecture The Statistical Approach	Lecture Housing and Durables	Class
11:15-11:30	Coffee	Coffee	Coffee	Coffee	Coffee
11:30-12:30	Lecture Elementary Methods	Lecture The Economic Approach	Class	Lecture Quality Change and New Goods	Class
12:30-13:15	Lunch	Lunch	Lunch	Lunch	Lunch
13:15-14:15	Lecture The Axiomatic Approach	Lecture The Economic Approach	Lecture The CPI	Class	Lecture Productivity
14:15-14:30	Tea	Tea	Tea	Tea	Tea
14:30-15:30	Lecture The Axiomatic Approach	Lecture The Statistical Approach	Lecture The CPI	Lecture Hedonic Models	Review of Unit

Introduction to Index Numbers and Overview - The Index Number Problem, Taxonomy of approaches, Implicit and direct index numbers, Index number formulae, Basic issues in index number calculation, Current issues in Index Numbers.

Test/Axiomatic Approaches to Index Numbers - Bilateral Indices, Fixed Base and chained indices, Multilateral index number approaches, Making international comparisons – the Penn World Tables and the ICP data.

Economic Approaches to Index Numbers – Preliminaries, Cost of living index, Testing the economic approach, Constructing a cost-of-living index, Estimation & approximation, Exact and superlative index numbers, Nonparametric bounds.

The Statistical Approach to Index Numbers - Statistical models of inflation, Elementary aggregates, The Dutot, Carli and Jevons indices, Formula bias and Jensen's Inequality.

Housing and Durables - Pricing durables, The User cost method, Net Acquisitions, Rental equivalence.

Measuring Productivity - Partial factor productivity, Total factor productivity, Multilateral productivity indices, Growth accounting, Regression methods, Malmqvist indices.

Hedonics and Quality Change - Problem of quality change and some solutions, Modelling quality change, The repackaging model, The linear characteristics model.

9. Availability of STATA for Home PCs

STATA CDs (with single user license codes) will be provided for home use. After submission of the coursework, you are asked to uninstall STATA and return the CDs to Claire Woodley, the MOffStat Programme Administrator. Please note that these are single user licenses and you MUST uninstall STATA from your PC so that the licenses can be used in other modules.

10. Blackboard Unit

To access the Blackboard site use Internet Explorer and enter the web address <http://blackboard.soton.ac.uk/>, login and select the “MSc Official Statistics Student Area” site. Select “Individual Units” from the left-hand menu, select the “2015-16 Units” folder, and then select “STAT6091-28301-15-16: 15-16-Index Numbers-28301”.

Materials for all of the computer workshops, including the worksheets, the datasets, and the solutions, will be made available here. There is also a discussion board on Blackboard so that you can communicate with your fellow students. All students are automatically enrolled on this blackboard site. If you cannot access the site for any reason please let the lecturers know so that you can be enrolled.

11. Assessment Methods

Assessment will be on the basis one piece of coursework - one of a choice of three essays.

Your submission should be posted to MOffStat Programme Administrator, Professional Development Unit, Faculty of Social and Human Sciences, Room 2087, Building 58, University of Southampton, Southampton, SO17 1BJ.

The deadline for submission of the assessment is **10th May 2016**, with the post mark required by the preceding Monday. Send 2 copies and attach the coursework hand-in form, available at

http://www.southampton.ac.uk/demography/postgraduate/taught_courses/msc_official_statistics.page?

It is policy that all assignments must also be submitted electronically via Turnitin. Please note that this is in addition to submission of a hard copy.

12. Electronic submission of coursework

- To submit coursework electronically via the TurnitinUK plagiarism device, login to Blackboard, select the specific unit for this module and select the Assignments link from the left-hand menu. Find the coursework and click View/Complete. There will be a series of screens to complete, and full instructions on how to do this are given on the iSolutions webpages at:

<http://www.southampton.ac.uk/isolutions/computing/elearn/blackboard/student/studentplagiarism.html>.

- When you submit electronically you will receive a **submission ID number**, which you **MUST** include on the front cover of your hardcopy submission. You will therefore need to submit electronically **BEFORE** you post your hard copy.
- Turnitin is a plagiarism detection tool, which checks your work against electronic sources and other submissions for the same assignment. You will only be able to submit your assignment once to Turnitin.
- You will also receive an email (maybe up to a day later, but most likely within a few minutes) confirming that you have submitted electronically. You should retain a copy of this email which will act as a receipt for your electronic submission. If you do not receive a submission ID number or an email it means that you have not submitted. If this is the case **you will be penalised**. If you do not receive this email then you should contact the lecturers as soon as possible.

13. Penalty for late submission

The penalty for unauthorised late submission of coursework is as follows:

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	Zero

For example, if your mark is 63% but you submit your work 3 working days late, then your final mark would be $63 \times 0.7 = 44.1\%$. Note that late submission of ***either*** the hard copy ***or*** the electronic copy will be penalised in this way.

14. Procedure for coursework extensions

Deadlines are made to be met. If you want to request an extension, you must have medical or personal circumstances to justify the late submission of assessed coursework (medical evidence must be substantiated by a doctor's note).

You should initially fill out a coursework extension request form available at

http://www.southampton.ac.uk/demography/postgraduate/taught_courses/msc_official_statistics.page?

and send it to your Personal Tutor who will, where appropriate, agree to the extension of the deadline after discussion with the module co-ordinator and examination officer. Under no circumstances will extensions be allowed beyond a period of two weeks.

15. Resit arrangements

No mark below 25% is allowed for any module in the programme. All students receiving below the minimum mark will have to resit the module according to school policy.

16. Academic Integrity

The University places the highest importance on the maintenance of academic integrity in the conduct of its affairs, and the Academic Integrity Statement for Students can be found in the University Calendar available online at <http://www.calendar.soton.ac.uk/sectionIV/academic-integrity-statement.html>. Please familiarise yourself with what is expected of you in this regard by reading through this statement. Your attention is drawn particularly to Appendix 1, which outlines those things which you must seek to avoid, including cheating and plagiarism. A very useful set of interactive guides is available at <http://www.studyskills.soton.ac.uk>. These aim to help you gain a better understanding of academic integrity and develop your skills so that your assessed work does not accidentally plagiarise the work of others.

You must take particular care in using sources in essays/reports and in your dissertation. Remember that plagiarism includes not only verbatim copying but also direct paraphrasing of a source. Verbatim quotes from a source should always be in quotation marks, with the source indicated, and should be used only occasionally in an essay or other report. Detailed advice on appropriate referencing in essays and dissertations is given in the Division of Social Statistics and Demography "Guidelines on writing essays".

Students are encouraged to discuss and exchange ideas, since this is an important part of the educational process. However, it is NOT acceptable that you read and gain ideas for your coursework from another student's finished work. Copying includes using another student's computer program, output or graphics. If academic integrity is deemed to have been breached, there are a range of penalties that may be applied.

If you are unsure about what is and is not permitted, ask - we will be happy to explain and discuss.

17. Feedback

'Feedback' refers to any instance in which you receive information about how well you understand the material, how successfully you are progressing in the module, or how to improve your performance. Feedback is continuous and does not refer merely to comments on your assessed work (but certainly includes that). Other instances in which you receive feedback include: seminar/tutorial discussions, question time during lectures, replies to questions during computer workshops, interaction with others in any online discussion forum, replies to email questions you send us, discussions with us during the week.

In line with University policy, feedback on your coursework assessment will be provided within four weeks of the submission deadline, and is likely to be in the form of an individual feedback sheet containing suggestions for improvement.

18. Troubleshooting

Please get in touch with the Moffstat Programme Coordinator, Dr Paul Smith, should any difficulties arise with this module.