

ECON6309

Economic Measurement

Course Outline

Semester 2, 2017

Course-Specific Information

The Business School expects that you are familiar with the contents of this course outline. You must also be familiar with the Course Outlines Policies webpage which contains key information on:

- Program Learning Goals and Outcomes
- Academic Integrity and Plagiarism
- Student Responsibilities and Conduct
- Special Consideration
- Student Support and Resources

This webpage can be found on the Business School website:

<https://www.business.unsw.edu.au/degrees-courses/course-outlines/policies>

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1 STAFF CONTACT DETAILS

Lecturer-in-charge: Professor Kevin Fox

Location: Room 3119 Quad Building

Phone: 9385 3320

Email: k.fox@unsw.edu.au

Consultation Times: Fridays 11am -- 12 noon, 3-3:30pm, or by appointment

Tutor: Professor Kevin Fox

1.1 Communications with staff

You should feel free to contact your lecturer about any academic matter. However, where possible, all enquiries about the subject material should be made at lectures or tutorials or during consultation times. Discussion of course subject material will not be entered into via lengthy emails.

2 COURSE DETAILS

2.1 Teaching Times and Locations

Lectures start in Week 2 (to Week 13).

The time and location each week is: Friday 12-3pm in Business School 205.

2.2 Units of Credit

The course is worth 6 units of credit. Honours, M.Ec. and PhD students may be taught in the same class. There will be appropriately different expectations for students at different stages of study, in particular in relation to the research assignment.

2.3 Summary of Course

This course covers the theory and practice of economic measurement, including the measurement of key economic indicators such as the Consumer Price Index, Gross Domestic Product and productivity growth. Approaches employed by international statistical agencies will be highlighted, along with the possibility that policy implications are often reliant on the choice of measurement techniques. The course will be technically rigorous, particularly in the use of microeconomic theory and econometric analysis, and will draw on the latest international research developments.

2.4 Aims and Relationship to Other Courses

The aim of this course is to give you a solid foundation in the field of economic measurement. This is not only valuable in itself, but also aids in the understanding of data sources, uses and reliability, which can enhance empirical modelling and understanding. A side objective is to practice rigorous economic and mathematical reasoning to enhance your analytical skills. In addition, the course provides opportunities for developing applied research, technical writing, collaboration and communication skills, which are of great value in the workplace and in studying other courses.

2.5 Student Learning Outcomes

The Course Learning Outcomes are what you should be able to DO by the end of this course if you participate fully in learning activities and successfully complete the assessment items.

The Learning Outcomes in this course also help you to achieve some of the overall Program Learning Goals and Outcomes for all undergraduate coursework students in the Business School. Program Learning Goals are what we want you to BE or HAVE by the time you successfully complete your degree. You demonstrate this by achieving specific Program Learning Outcomes - what you are able to DO by the end of your degree.

For more information on Program Learning Goals and Outcomes, see the School's Course Outlines Policies webpage available at <https://www.business.unsw.edu.au/degrees-courses/course-outlines/policies>.

The following table shows how your Course Learning Outcomes relate to the overall Program Learning Goals and Outcomes, and indicates where these are assessed:

Program Learning Goals and Outcomes		Course Learning Outcomes	Course Assessment Item
<i>This course helps you to achieve the following learning goals</i>		<i>On successful completion of the course, you should be able to:</i>	<i>This learning outcome will be assessed in the following items:</i>
1	Knowledge	Acquire and use up-to-date bodies of knowledge, through research-led teaching.	<ul style="list-style-type: none"> • Tutorial Assignments • Research Assignment • Final Exam
2	Critical thinking and problem solving	Confidently continue to learn, through an openness to ideas and an understanding of their own potential. Use a global outlook, through awareness of similarities and differences across borders, and seeing the world as the context for their future career development.	<ul style="list-style-type: none"> • Tutorial Assignments • Research Assignment • Final Exam
3a	Written communication	Construct written work which is logically and professionally presented.	<ul style="list-style-type: none"> • Tutorial Assignments • Research Assignment • Final Exam
3b	Oral communication	Communicate ideas in a succinct and clear manner.	<ul style="list-style-type: none"> • Tutorial Presentation
4	Teamwork	Work collaboratively to complete a task.	<ul style="list-style-type: none"> • Tutorial Assignments • Research Assignment
5a.	Ethical, environmental and sustainability considerations	Contribute to the well-being of society, through skilled, responsible, imaginative, ethical and flexible professional practice	<ul style="list-style-type: none"> • Tutorial Assignments • Research Assignment • Final Exam

5b.	Social and cultural awareness	Not specifically addressed in this course.	
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3 LEARNING AND TEACHING ACTIVITIES

3.1 Approach to Learning and Teaching in the Course

The philosophy underpinning this course and its Teaching and Learning Strategies are based on “Guidelines on Learning that Inform Teaching at UNSW. These guidelines may be viewed at: www.guidelinesonlearning.unsw.edu.au. Specifically, the lectures, tutorials and assessment have been designed to appropriately challenge students and support the achievement of the desired learning outcomes. A climate of inquiry and dialogue is encouraged between students and teachers and among students (in and out of class). The lecturers and tutors aim to provide meaningful and timely feedback to students to improve learning outcome.

3.2 Learning Activities and Teaching Strategies

The examinable content of the course is defined by the references given in the Lecture Schedule, the content of Lectures, and the content of the Tutorial Program.

This is not a course where you can become proficient just by observing. You will need to get involved in class – evaluating information, asking and answering questions. You must also learn to organise your independent study and practise enough problems to gain a thorough understanding of concepts and how to apply them.

Students are expected to:

- put a consistent effort into learning activities throughout the semester,
- take a responsible role in preparing for tutorials and participating in them,
- develop communication skills through engaging in classroom discussions,
- concentrate on understanding how and why to use formulae and less on memorising them,
- learn to work effectively with other students in order to complete tutorial and research assignments, and
- make continuous improvements by using the feedback from assessments.

3.2.1 Lectures

Lectures will introduce and emphasise the course content. They will include explanation of relevant topics and theory together with the use of worked examples to demonstrate the theory in practice. Where possible, lectures will show the relevance and application of the quantitative techniques covered in this course to real-world applications.

To get the most out of the lectures, students are strongly encouraged to familiarise themselves with the prescribed readings as given in the course outline prior to attending each lecture, and to be prepared to take notes during the lecture itself.

There is only a very limited time for questions to be answered during the lectures themselves. However, the tutorial class (see below) is an ideal forum for students to test their understanding and seek further instruction. Additionally, consultation times with lecturer can be used by students to clarify the lecture material.

You should attend one two-hour lecture per week.

3.2.2 Tutorials

Tutorials commence in week 3. The purpose of tutorials is to enable students to raise questions about difficult topics or problems encountered in their studies, and to develop communication skills. Students must not expect another lecture, but must come prepared with questions of their own.

Students are reminded of the University rule that if they attend less than 80 percent of possible classes, including tutorials, they may be refused final assessment.

4 ASSESSMENT

4.0 You must complete the “Working with Academic Integrity” module on your Moodle site, before you hand in any written work.

- You MUST complete the ‘Working with Academic Integrity’ module AND THE MODULE’S QUIZ, found on your course Moodle site, BEFORE YOU ARE ALLOWED TO SUBMIT ANY WRITTEN ASSESSMENT.
- If your submission is delayed because you did not complete the module and the quiz, you may be liable to late penalties as specified in your course outline.
- Failing to comply with the University rules of Academic integrity may result in serious consequences:
 - All cases of plagiarism (regardless of their severity) ARE recorded with the University Integrity Office University register.
 - Depending on the level of the plagiarism/misconduct, the penalties may include a FAIL grade for the assessment piece, a FAIL grade for the course, or being expelled for serious/repeat offences.

Any misconduct, including plagiarism, is recorded on your Conduct Record. If you have only one academic misconduct at the lowest level (level A) in your career, then the record is wiped clear when you graduate. Otherwise it remains there permanently. *Many professions, such as accounting and law, require access to the student’s Conduct Record.*

4.1 Formal Requirements

In order to pass this course, you must:

- achieve a composite mark of at least 50 out of 100; AND
- make a satisfactory attempt at ALL assessment tasks.

4.2 Assessment Details

Assessment Task	Weighting	Length	Due date
Tutorial Assignments	10%	See section 4.3 below	See section 4.3 below
Research Assignment	30%	See section 4.4 below	Start of last lecture
Final Exam	60%	2 hours	As scheduled in official exam period
	100%		

4.3 Tutorial Assignments

To facilitate the goals of the tutorials (see section 3.2.2), a set of exercises is assigned each week. **Students should attempt all of them.** Students will not gain a proper understanding of the topics unless they master these assignments. (The tutorial exercises will give a good indication of the kind of questions that can be expected in examinations.)

Answers to tutorial assignments will be collected from students without warning. Four tutorial assignments (2.5% weight on each) will count towards 10% of your overall mark for the subject. Hence, you should come to each tutorial with your attempted answers neatly prepared in case the assignment is collected during that tutorial. More than four assignments may be collected during the semester but only four assignments will count towards your overall mark.

Students are encouraged to collaborate on these assignments. However, the presentation of the answers should be done individually. Identically presented answers will be given a mark equal to (raw mark)/(total number of identical assignment answers).

4.4 Research Assignment

The assignment will be distributed in Week 3, and will be due on 27 October (Week 13), 5pm through online submission.

The research assignment is intended to help students develop applied research and technical writing skills. The best assignment will be considered for presentation at the Economic Measurement Group Workshop, 1 December, 2017.

The penalty for late submission will be FIVE MARKS (out of thirty) per day.

4.5 Final Examination

The final will be a two hour examination held during the university exam period. The format of the exam will be announced in the last week of lectures.

4.6 Protocol for viewing final exam scripts

The UNSW Business School has set a protocol under which students may view their final exam script. Please check the protocol [here](#).

4.7 Quality Assurance

The Business School is actively monitoring student learning and quality of the student experience in all its programs. A random selection of completed assessment tasks may be used for quality assurance, such as to determine the extent to which program learning goals are being achieved. The information is required for accreditation purposes, and aggregated findings will be used to inform changes aimed at improving the quality of Business School programs. All material used for such processes will be treated as confidential and will not be related to course grades.

5 COURSE EVALUATION AND DEVELOPMENT

Each year feedback is sought from students and other stakeholders about the courses offered in the School and continual improvements are made based on this feedback. UNSW's myExperience Survey Tool is one of the ways in which student evaluative

feedback is gathered. You are strongly encouraged to take part in the feedback process.

6 COURSE RESOURCES

The website for this course is on UNSW Moodle at:

<http://moodle.telt.unsw.edu.au>

There is no required textbook for this course. Lecture notes will be made available. Readings will be assigned for each topic, as appropriate. In particular, we will make use of three sources of notes that have been prepared by Professor W. Erwin Diewert of the University of British Columbia and UNSW, with titles (and abbreviations) as follows:

- Index Number Theory and Measurement Economics (“INTME”):
- The Measurement of Business Capital, Income and Performance (“Barcelona Lectures”).
- Applied Economics (“AE”).

These notes are available through the links at the following website:

<http://www.economics.ubc.ca/faculty-and-staff/w-erwin-diewert/>

We will also make reference to the academic research papers and publications of international agencies, such as:

- OECD Productivity Manual: www.oecd.org/std/productivity-stats/2352458.pdf
- *OECD Capital Manual*: www.oecd.org/std/productivity-stats/43734711.pdf
- CPI Manual (International Labour Office):
<http://www.ilo.org/public/english/bureau/stat/guides/cpi/index.htm#manual>

6.1 Some Other Resources

1. The Society for Economic Measurement (SEM) “was founded to promote research on economic measurement, using advanced tools from economic theory, econometrics, aggregation theory, experimental economics, mathematics, and statistics”. The website provides links to conference information and other resources. Membership is free, and students are encouraged to become members: sem.society.cmu.edu/home.html
2. The Centre for the Study of Living Standards (CSLS) publishes the *International Productivity Monitor*, which publishes articles which are “largely nontechnical in nature and understandable to a wide audience of productivity researchers and analysts as well as the general public”. CSLS also publishes various interesting reports: www.csls.ca
3. The International Association for Research in Income and Wealth publishes the academic journal *Review of Income and Wealth*, and organises conferences with economic measurement themes: www.iariw.org

7 COURSE SCHEDULE

7.1 Lecture Schedule

Lectures start in Week 2 and run to Week 13.

LECTURE SCHEDULE	
Week	Topic
Week 1 28 July	<i>NO LECTURE: Individual Preparatory Reading</i>
Week 2 4 August	Introduction to Economic Measurement and Early Approaches to Index Numbers
Week 3 11 August	Axiomatic Approach to Bilateral Index Number Theory
Week 4 18 August	The Cost of Living Index I
Week 5 25 August	The Cost of Living Index II
Week 6 1 September	Elementary Indexes
Week 7 8 September	Adjusting for Quality Change
Week 8 15 September	Measurement of Capital
Week 9 22 September	Measurement of Labour
Mid-semester break: 23 September – 2 October inclusive (2 Oct = Labour Day Public Holiday)	
Week 10 6 October	Measurement of Income
Week 11 13 October	Measurement of Productivity I
Week 12 20 October	Measurement of Productivity II
Week 13 27 October	Measurement of Productivity III Special Topics/Review/Research Directions

Topics in More Detail

Introduction to Economic Measurement and Early Approaches to Index Numbers

1. The Purpose and History of Economic Measurement
2. Index Number Purpose and Overview
3. The Fixed Basket Approach
4. The Unweighted Statistical or Stochastic Approach
5. The Weighted Stochastic Approach of Theil
6. The Divisia Approach
7. The Approaches of Bennet and Montgomery
8. The Aggregation Theorems of Hicks and Leontief

Primary References:

- Griliches, Z. (1985), "Data and Econometricians — The Uneasy Alliance," *American Economic Review* 75(2), 196-200.
- Griliches, Z. (1994), "Productivity, R&D, and the Data Constraint," *American Economic Review* 84, 1-23
- Diewert (INTME): Chapter 1

Axiomatic Approach to Bilateral Index Number Theory

1. Bilateral Indexes and Some Early Tests
2. Homogeneity Tests
3. Invariance and Symmetry Tests
4. Mean value tests
5. Monotonicity Tests
6. The Fisher ideal index and the test approach
7. The Test Performance of Other Indexes
8. The Additivity Test
9. The Circularity Test

Primary References:

- Balk, B.M.(2008), *Price and Quantity Index Numbers*, New York: Cambridge University Press.
- Diewert (INTME): Chapter 3

The Cost of Living Index I: Theory

1. The Könus Cost of Living Index for a Single Consumer
2. The True Cost of Living Index when Preferences are Homothetic
3. Wold's Identity and Shephard's Lemma
4. Superlative Indexes: The Fisher Ideal Index
5. Quadratic Mean of Order r Superlative Indexes
6. Superlative Indexes: The Törnqvist Index

Primary References:

- Balk, B.M.(2008), *Price and Quantity Index Numbers*, New York: Cambridge University Press.
- Diewert (INTME): Chapter 4
- Diewert (1976), "Exact and Superlative Index Numbers," *Journal of Econometrics* 4, 114-145.

The Cost of Living Index II: Multiple Consumers and Problems with the Theory

1. Plutocratic Cost of Living Indexes and Observable Bounds
2. The Fisher Plutocratic Price Index
3. Democratic versus Plutocratic Cost of Living Indexes
4. Do Households Face Prices that are Independent of the Quantity Purchased?
5. Household Composition is not Constant over Time
6. Household Preferences and Environmental Variables are not Constant over Time
7. Is it Realistic to Assume that Households have Preferences over all Possible Commodities?
8. Traditional Consumer Theory Ignores the Problems Posed by Household Production
9. The Problem of Integer Purchases rather than Continuous Unit Purchases
10. Economic Approaches to the CPI do not Deal Adequately with the Problem of Seasonal Commodities

Primary References:

Diewert (INTME): Chapters 5 and 6

Prais, S.J. (1959), "Whose Cost of Living?" *Review of Economic Studies* 26, 126{134.

Elementary Indexes

1. Ideal Elementary Indexes
2. Elementary Indexes used in Practice
3. Relationships between the Frequently Used Elementary Indexes
4. Axiomatic Approach to Elementary Indexes
5. Economic Approach to Elementary Indexes
6. Sampling Approach to Elementary Indexes
7. Stochastic Approach to Elementary Indexes

Primary References:

1. Diewert (INTME): Chapter 10

2. CPI Manual, Chapter 9

Some Supplementary Reading:

Diewert, W.E. and K.J. Fox (2017) "Substitution Bias in Multilateral Methods for CPI Construction using Scanner Data," UBC Discussion Paper 17-02.

Ivancic, L. and K.J. Fox (2013), "Understanding Price Variation Across Stores and Supermarket Chains: Some Implications for CPI Aggregation Methods," *Review of Income and Wealth* 59(4), 629-647

Ivancic, L., W.E. Diewert and K.J. Fox, (2011), "Scanner Data, Time Aggregation and the Construction of Price Indexes," *Journal of Econometrics* 161, 24-35.

Adjusting for Quality Change

1. Matched Models Method
2. Some Quality Adjustment Methods
3. Comparison of Implicit Methods of Quality Adjustment
4. Explicit Methods of Quality Adjustment
5. Hedonic Regression Approach
6. Hedonic Price Indexes

Primary References:

CPI Manual: Chapter 7

Diewert, W.E. (2003), "Hedonic Regressions: A review of some unresolved issues," 7th Meeting of the Ottawa Group, Paris, 27-29 May.

http://www.economics.ubc.ca/files/2013/06/pdf_paper_erwin-diewert-hedonic-regressions.pdf

Some Supplementary Reading

Fox, K.J. and D. Melsner (2014), "Non-linear Pricing and Price Indexes: Evidence and Implications from Scanner Data," *Review of Income and Wealth* 60(2), 261-278.

Diewert W. E., J. de Haan and R. Hendricks (2014), "Hedonic regressions and the Decomposition of a House Price Index into Land and Structure Components," *Econometric Reviews*, forthcoming.

Hill, R. J. (2013), "Hedonic price indexes for residential housing: A survey, evaluation and taxonomy", *Journal of Economic Surveys* 27(5), 879-914.

Hill, R. J. and I. A. Syed (2012), "Hedonic price-rent ratios, user cost, and departures from equilibrium in the housing market," Discussion Papers 2012-45, School of Economics, The University of New South Wales.

Measurement of Capital

1. Capital Stock Construction
2. User Cost of Capital
3. Implementation of the User Cost Approach
4. Some Difficult Topics: capital stocks for R&D, inventories and land.

Primary References:

ABS (2013), *Australian System of National Accounts: Concepts, Sources and Methods*, Canberra. (5216.0) Chapter 19.

Diewert, W.E. and K.J. Fox, "Alternative User Costs, Productivity and Inequality in US Business Sectors," in W.H. Greene, L.A. Khalaf, P. Makdissi, R. Sickles, and M-C. Voia (eds.), *Productivity and Inequality*, Springer, forthcoming.

Diewert: Barcelona Lectures, chapters I to VI.

Fox, K.J. (1997), "Open Economy Data Sets for 18 OECD Countries, 1960{1992," UNSW School of Economics Discussion Paper 97/26.

OECD (2009), *Measuring Capital* ("OECD Capital Manual"), Paris.

Measurement of Labour

1. Measurement of hours worked
2. Measurement of Human Capital
3. Quality Adjustment of Labour Inputs

Primary References:

Australian Bureau of Statistics (6102.0.55.001) *Labour Statistics: Concepts, Sources and Methods*, 2013

ABS (6202.0) *Labour Force*, Australia, June 2014

ABS Research Paper (1352.0.55.077): *Estimating Average Annual Hours Worked* (Methodology Advisory Committee), 2006

ABS Research Paper (1351.0.55.010): *Quality-adjusted Labour Inputs*, 2005

ABS Working Paper: *Measuring the Stock of Human Capital for Australia: Experimental Estimates*, Working Paper No. 2004/1.

Some Supplementary Reading:

- Griliches, Z. (1996), "Education, Human Capital, and Growth: A personal perspective," NBER Working Paper 5426.
- Fox, K.J. and C.M. Schwartz (2007), "Alternative Measures of Labour Underutilisation: Gender, education and unemployment," Centre for Applied Economic Research Working Paper No. 2007/04, University of New South Wales, Sydney, Australia.

Measurement of Income

1. Real GDP versus Real Domestic Income
2. Gross, Net and Alternative Definitions of Income

Primary References:

- Diewert: Barcelona lectures, chapter VII.
- Diewert, W.E. and K.J. Fox (2007), "The New Economy and an Old Problem: Net versus Gross Output and the Measurement of Productivity," manuscript.
- Kohli, U. (2004), "Real GDP, Real Domestic Income, and Terms-of-trade Changes," *Journal of International Economics* 62, 83-106.

Supplementary Reading

- Hill, R.J. and T.P. Hill (2003), "Expectations, Capital Gains and Income," *Economic Inquiry* 41, 607-619.

Measurement of Productivity I

1. One Input and One Output Case
2. Determinants of Productivity growth
3. Increasing Returns to Scale
4. Index Number Approach to the Measurement of Productivity

Primary References:

- Diewert: Barcelona lectures, chapter VIII.
- Diewert, W.E. and K.J. Fox (2001), "The Productivity Paradox and Mismeasurement of Economic Activity," in K. Okina and T. Inoue (eds.), *Monetary Policy in a World of Knowledge-based Growth, Quality Change, and Uncertain Measurement*, Palgrave.

Some Supplementary Reading:

- Caves, D.W., L.R. Christensen and W.E. Diewert (1982), "The Economic Theory of Index Numbers and the Measurement of Input, Output, and Productivity," *Econometrica* 50, 1393-1414.
- Connolly, E. and K.J. Fox (2006), "The Impact of High-Tech Capital on Productivity: Evidence from Australia," *Economic Inquiry* 44(1), 50-68.
- Diewert, W.E. and K.J. Fox (2008), "Returns to Scale, Technical Progress and Monopolistic Markups," *Journal of Econometrics* 145, 174-193.
- Diewert, W.E. and C.J. Morrison (1986), "Adjusting Output and Productivity Indexes for Changes in the Terms of Trade," *Economic Journal* 96, 659-679.
- Fox, K.J. and U. Kohli (1998), "GDP Growth, Terms-of-Trade Effects, and Total Factor Productivity," *Journal of International Trade and Economic Development* Vol. 7, No. 1, 87-110.
- OECD (2001), *Measuring Productivity: Measurement of Aggregate and Industry-Level Productivity Growth ("OECD Productivity Manual")*, Paris.

Measurement of Productivity II

1. Translog GDP Function
2. Accounting for Growth: An index number approach
3. Accounting for Growth: Parametric estimates
4. Specification of Functional Form and the Estimation of Technical Progress
5. The Decomposition of Productivity Change
6. Efficiency Analysis
7. Malmquist Index

Primary References:

- Fox, K.J. and U. Kohli (1998), "GDP Growth, Terms-of-Trade Effects, and Total Factor Productivity," *Journal of International Trade and Economic Development* Vol. 7, No. 1, 87-110.
- Coelli, Battese and Rao (1998), *An Introduction to Efficiency and Productivity Analysis*, Kluwer Academic Publishers, chapters 6 and 8.
- Diewert: AE, Chapter 8.
- Diewert: Barcelona lectures, chapter IX.

Some Supplementary Reading:

- Färe, R., S. Grosskopf, M. Norris and Z. Zhang (1994), "Productivity Growth, Technical Progress, and Efficiency Change in Industrialized Countries," *American Economic Review* 84, 66-83.
- Fox, K.J. (1996), "Specification of Functional Form and the Estimation of Technical Progress," *Applied Economics* 28, 1996, 947-956.
- Fox, K.J., R.Q. Grafton, J. Kirkley and D. Squires (2003), "Property Rights in a Fishery: Regulatory Change and Firm Performance," *Journal of Environmental Economics and Management* 46, 156-177.

Measurement of Productivity III

1. Hicks-Moorsteen-Bjurek Index
2. Intangibles
3. R&D and Productivity

Primary References

- Diewert, W.E. and K.J. Fox (2017), "Decomposing Productivity Indexes into Explanatory Factors," *European Journal of Operational Research* 256, 275–291, 2017
- Elnasri, A. and K.J. Fox (2014), "The Contribution of Research and Innovation to Productivity," *Journal of Productivity Analysis* 47, 291-308.

Some Supplementary Reading:

- Corrado, C., C. Hulten and D. Sichel (2005), "Measuring capital and technology: An expanded framework," in H. J. Corrado, C. and D. Sichel, eds, *Measuring Capital in the New Economy*. Studies in Income and Wealth, vol. 65, The University of Chicago Press.
- Corrado, C., C. Hulten and D. Sichel (2006), 'Intangible capital and economic growth', NBER Working Paper No. 11948. National Bureau of Economic Research, Cambridge, Massachusetts.
- Haskel, J. and G. Wallis (2013), 'Public support for innovation, intangible investment and productivity growth in the UK market sector', *Economics Letters* 119, 195-198.

Special Topics/Review/Research Directions

1. Topics by demand
2. Review
3. Research Directions: Problems that students should solve in the future

Primary References:

Diewert, W.E. (2006), "The Berne OECD Workshop on Productivity Analysis and Measurement: Conclusions and Future Directions,"
<http://www.oecd.org/std/productivity-stats/37731402.pdf>

7.2 Tutorial Schedule

Tutorials start in Week 3 and finish in Week 13. Further details to be announced via the course website at: <http://moodle.telt.unsw.edu.au>