

# ECON 4700 A

## Measurement Economics

### 2019 Early Summer (May-June)

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<b>Affiliation:</b>	Statistics Canada
<b>Office:</b>	B-840, 8th floor of the Loeb Building (don't count on me being here too often. Best to contact me via email).
<b>Telephone:</b>	If you would like to speak over the phone, we can set up a mutually convenient time for this through email.
<b>Emails:</b>	marc.prudhomme@carleton.ca
<b>Office hours:</b>	After or before class.
<b>Class schedule:</b>	Monday and Wednesday 18:05 to 20:55.
<b>Class location:</b>	MacKenzie Building, Room 3174.
<b>First Class:</b>	May 6 (no class May 20 <sup>th</sup> b/c of statutory holiday)
<b>Last Class:</b>	June 18
<b>Final exam period:</b>	June 21 - 27
<b>Prerequisite(s):</b>	(ECON 2030 with a grade of C- or higher or ECON 2003 (no longer offered) with a grade of C- or higher, ECON 2103 with a grade of C- or higher, and ECON 2202 (or equivalent) with a grade of C- or higher). <i>Students who believe they have taken a similar background course or courses from another university must provide appropriate documentation to the Department of Economics Undergraduate Administrator, Amanda Wright.</i>

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“[...] when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the state of science, whatever the matter may be. <sup>[1]</sup>”

“We're not putting full weight on that data and it has to be said that it doesn't entirely feel right that investment is, as measured, falling at a time when we see continued strengthening investment intention. [...] I was much more comfortable with the data in Canada. <sup>[2]</sup>”

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## 1. Course description

The main focus of this course is to learn how economic activity is measured and how the corresponding indicators and variables are constructed. Much of the focus is on national accounting and index numbers but other topics are also covered such as the measurement of capital and depreciation, productivity, employment and unemployment, poverty and inequality, household production, environmental accounting, the balance of payments, and international comparisons.

## 2. Course objectives and some background

The main objective of the course is to introduce to the student to the expanding and fascinating field of economic measurement. In the end, you will have acquired a solid foundation in the fundamentals in this field of economics by having explored the multiplicity of sources of economic data as well as their construction, uses and of course their limitations.

Measurement economics is perhaps one of the lesser known areas of study in the broader field of economics. It remains nevertheless certainly one of the most important ones. As the economy expands, hence becoming more complex and dynamic, more policy questions are raised and need to be addressed, more trends must be analyzed and often acted upon, economic and social programs are required, and more accurate forecasts must be made. This is when good economic intelligence and reliable data play an important role. Indeed, only when the performance of the economy is accurately measured and understood can its

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[1] William Thomson (Lord Kelvin) (1927)

[2] Mark Carney, The Telegraph 26 Nov 2013.

scarce resources be efficiently targeted to those sectors where they will have the most impact and do the greatest good.

The importance and need of good economic data is well articulated in a speech by David Dodge, a past Governor of the Bank of Canada, when he addressed the Conference of European Statisticians in 2003:

“Basically, we need to understand the reasons for these differences in productivity levels and growth, if we are to formulate appropriate policy responses. But if the data are not comparable, then we do not know how much of a problem we really have to begin with. [3]”

The material thought in this course remained obscure for many years by the economics profession. It was never made available within a standalone course in most undergraduate economics programs in this country or abroad. This all changed however in the 1990s with the Boskin Commission Report (which we will discuss during this course) in which one of the following recommendations can be found:

“These professions should treat training in data collection, data analysis, and interpretation more seriously and give it more space and attention in the standard curriculum. There should be more emphasis on measurement and sampling issues in the training of economists and statisticians. Effort should also be put into improving the ties between professionals in government and their academic and business colleagues. The academic world needs to be cognizant of the important work done by its colleagues in government who provide them with much of the "raw material" for their subsequent analyses and show more appreciation of their efforts and understanding of the constraints under which they are laboring. [4]”

The perils of mis-measuring the economy were made quite clear when the Boskin Commission report from the US showed that the cumulative effect of a biased (or mis-measured) Consumer Price Index over a 10-year period in the U.S. was in the order of \$270 billion.

Note also how the role and the central place of data figured in a previous Federal budget speech.

“Good policy is impossible without good data. If we are to lift children out of poverty, we must first understand the cause. If we are to provide quality health care for seniors, we must know how many seniors there are and what services they need. If we want to protect minority languages, we need to know where they are spoken. Literally nothing that governments do can be done well without good data. That’s why, led by my colleague the Minister of Innovation, Science and Economic

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[3] [www.bank-banque-canada.ca/en/speeches/2003/sp03-8.html](http://www.bank-banque-canada.ca/en/speeches/2003/sp03-8.html)

[4] [www.ssa.gov/history/reports/boskinrpt.html#cpi8](http://www.ssa.gov/history/reports/boskinrpt.html#cpi8)

Development, our government wasted no time in bringing back the long-form census.

And we're going to do more. Often, when we ask for the evidence needed to make informed decisions, we find it just doesn't exist. For example, we know that many Canadians, particularly British Columbians, are concerned about the effect of foreign ownership in the housing market. Unfortunately, the problem isn't fully understood. More information is needed. To fill this data gap, and so many others like it, we will support Statistics Canada so that it can improve our understanding of important problems and help us all make better decisions."

Or the sudden wave of interest in GDP, when economists such as Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi argue in their recent book, *Mismeasuring Our Lives: Why GDP Doesn't Add Up*, that the current way of measuring GDP is a deeply flawed indicator of well-being.

Articles such as these and other ones have also caught the eye of not just economists but the population at large.

"On 5 November 2010, Ghana Statistical Services announced that it was revising the GDP estimates upwards by over 60 percent, suggesting that in previous GDP estimates economic activities worth about US\$13 billion had been missed. After the revision a range of new activities were accounted for, and as a result Ghana was suddenly upgraded from a low-income country to a lower-middle-income country."<sup>5</sup>

The subject of this course is well positioned to address the current wave of enthusiasm and a need for more focused training in the discipline of economics where measurement, understanding the numbers (so-to-speak), and developing more and better ones, play a central role in today's economics curriculum.

### 3. Approach to teaching

There will be two weekly three-hour lectures where we will introduce and discuss the topics from the outline. About once a week we will go through some of the major statistical releases from Statistics Canada.

Lecture time is at a premium, so it must be used efficiently. You cannot be taught everything in the classroom. Much of your learning must and will take place outside the regular teaching period. At a minimum you should plan on studying at least one hour outside the classroom for each hour in class.

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<sup>5</sup> <https://academic.oup.com/afraf/article-abstract/112/446/138/10183/Briefing-For-richer-for-poorer-GDP-revisions-and?redirectedFrom=fulltext>

Ideally students will have done some of the suggested readings before coming to class and have some questions for discussion prepared, thus ensuring that you get the most benefit from the lectures and the material.

Emphasis during the course will be on Canadian economic statistics. Statistics Canada is by far the leading producer and promoter of these data. Access to almost all socio-economic statistics is done through a central data portal which is found on the Statistics Canada website; it is a good source for consulting and accessing these data.

Other data sources will be explored at other times either through the assignments and in class.

I would like to emphasize that the reading material that is distributed (either with links in the PowerPoint slides, on CuLearn or by other means) are qualified as required readings and therefore, you can expect that this material will be part of your preparation for the exam. Simply reading the PowerPoint slides will not suffice to guarantee a good grade in this course.

## 4. Required textbook and reading material

A textbook that can adequately cover the material and topics that I plan on covering this semester has yet to be written. However, there are two books from which I will draw much of the material for this course and they appear as 1. and 2. below.

### 1. **The System of Macroeconomic Accounts Statistics: An Overview**

We will be working with certain parts of this book during the semester.

- **Author/Editor:** International Monetary Fund
- **Publication Date:** August 29, 2007
- **Electronic Access:** Free Full text (PDF file size is 1033 KB).  
<http://www.imf.org/en/Publications/Pamphlet-Series/Issues/2016/12/31/The-System-of-Macroeconomic-Accounts-Statistics-An-Overview-19789>
- **ISBN/ISSN:** 9781589066205/0538-8759
- **Summary:** Designed to meet the basic needs of economists and statisticians, this pamphlet is unique in providing an explanation of the key principles underlying macroeconomic statistics when viewed as an integrated system. It highlights the interrelationships between the various sectors and provides a bridge linking the various macroeconomic accounts statistics-national accounts, balance of payments, government finance statistics, and monetary and financial statistics-to assist the reader in understanding the main concepts underlying these statistics. It does so by simplifying many of the concepts, explaining common features and differences, showing how the four key statistical areas harmonize, and providing examples to

demonstrate the practical application and uses of the concepts within the conceptual framework.

## 2. A Practical Introduction to Index Numbers

We will be working with certain parts of this book during the semester.

- **Author/Editor:** Jeff Ralph, Rob O'Neill, Joe Winton
- **Publication Date:** August 2015
- **Electronic Access:** Available for loan as an eBook from the library. If you wish to purchase (\$), you can do so online from various booksellers.
- **ISBN/ISSN:** 978-1-118-97781-1
- **Summary:** From inflation and GDP to retail sales and share prices, many of the most important economic statistics are published as index numbers. Official statistics based on index numbers are used by almost every country in the world. The representation of data in index numbers form is a valuable statistical technique for understanding and communicating change; it allows useful comparisons to be made that would not otherwise be possible. This book provides a comprehensive introduction to measuring change with index numbers.
- **Key features:**
  - Introduces the theoretical background to the subject including a description of the most commonly used price and quantity index formulae
  - Covers the practical techniques needed when using index numbers, including chain linking and deflation.
  - Describes the application of index numbers with a focus on economic statistics, especially the general level of prices and inflation, as well as the wider application of the technique to both economic and non-economic spheres.
  - Reviews current issues and developments in the field.
  - Includes easy to follow examples and exercises with solutions.
  - Written by authors with wide expertise in the practice and development of index numbers, A Practical Introduction to Index Numbers has been designed for students new to this subject and will be an ideal accompanying text for those taking the Royal Statistical Society's Ordinary and Higher examinations. The book will also provide a valuable resource for users of Official Statistics who would like to enhance their knowledge of this important area.

### 3. Understanding Economic Statistics: an OECD perspective

I will sometimes make reference to certain parts of this book during the semester.

- **Author/Editor:** OECD
- **Publication Date:** August 29, 2007
- **Electronic Access:** Free Full text (PDF file size is 1033 KB). [http://www.oecd-ilibrary.org/economics/understanding-economic-statistics-an-oecd-perspective\\_9789264046986-en](http://www.oecd-ilibrary.org/economics/understanding-economic-statistics-an-oecd-perspective_9789264046986-en)
- **ISBN/ISSN:** 9781589066205/0538-8759
- **Summary:** Drawing on OECD statistics in particular, 'Understanding Economic Statistics: an OECD perspective' shows readers how to use statistics to understand the world economy. It gives an overview of the history, key concepts and the main providers of economic statistics. A detailed chapter provides a comprehensive picture of the main statistical activities of the OECD. Finally, the book explores the crucial issue of quality assurance and the implications for public trust.

Other material and articles that will be consulted at various times:

### 4. User Guide: Canadian System of Macroeconomic Accounts (13-606-G)

- <http://www5.statcan.gc.ca/olc-cel/olc.action?ObjId=13-606-G&ObjType=2&lang=en&limit=0>

### 5. Improving the Coverage of Official Statistics in Undergraduate Economics Textbooks

- <https://www2.bc.edu/robert-murphy/talk/WorldCongress.pdf>

### 6. Teaching Index Numbers to Economists

- <http://www.tandfonline.com/doi/full/10.1080/23322039.2015.1115625>

### 7. Applied Statistics

- <http://nsdl.niscair.res.in/jspui/bitstream/123456789/848/1/EconomicStatistics.pdf>

## 5. Outline (lecture topics)

- 1) General introduction and overview to measurement economics (6 - 9 hours)
  - a) Statcan and its data and other data sources.
  - b) Tools used for data analysis
  - c) Key indicators
  - d) Basic statistics/sampling
  - e) Seasonal adjustment
  - f) Some classification systems of economic activity
  - g) Other

- 2) Price indices and the cost-of-living (6 - 9 hours)
  - a) Uses
  - b) Basic index number theory
  - c) The theory of the cost-of-living
  - d) The consumer price index
  - e) Other price indices (excluding implicit price indexes)
  - f) Challenges and solutions facing index number compilers
  
- 3) The national accounts: Gross domestic product and productivity (12 - 15 hours)
  - a) Exploring the system of national accounts
  - b) Measuring current price and constant price GDP
  - c) The implicit price indices of GDP
  - d) What is wrong with GDP?
  - e) Input-output / supply-use tables in theory and practice
  - f) Measuring productivity
- 4) Measuring employment and unemployment (3 hours)
  
- 5) Purchasing Power Parity statistics (3 hours)
  
- 6) The Census (3 hours)
  
- 7) Topics of recent research and /or interest in the field of measurement economics such as environmental statistics (Time permitting).

## 6. Required work

There will be 3 non-research assignments during the term. More details about these assignments will follow. Note that sometimes the problems for these assignments will not be based on topics covered in class. Typically, the assignments will consist in finding and extracting data, analyzing, and producing graphs and tables by using analytical tools such as MS Excel. I also plan on having you explore the latest and greatest piece of free software for data analysis that is available today: Tableau. More on this later.

Each student must write an individual research assignment of 8 to 10 pages (excluding graphs and tables) based on a measurement related topic. This will be discussed in more detail in the next week or so. I will also provide suggested topics. It is important that you find your topic very soon. The semester really flies in the summer!

This course has only one final exam that is cumulative (covers the material from the beginning). Note the material for the exam will be drawn from the assignments, the PowerPoint slides and the assigned readings.

Please be aware that plagiarism is a serious offence at Carleton and should be recognized and avoided. For further information on how to do so, please see “Pammett on Plagiarism and Paraphrasing.”<sup>[6]</sup>

## 7. Assessment

The various components of the course will have the following weights:

Assignments (3 × 10 %):	30 %
Research assignment:	25 %
Final Exam:	45 %
<b>Total</b>	<b>100%</b>

This % grade will then be converted into the alphabetical grade system using the standard equivalences, as outlined in Section 2.3 of the Academic Regulations of the University in the Undergraduate Calendar.

Students must fulfil all of the preceding course requirements in order to achieve a passing grade (D- or higher). Failure to write the final examination will result in a failing grade. Students must fulfill all course requirements in order to achieve a passing grade. Failure to write the final examination when the student has achieved satisfactory performance during the term will result in a grade of ‘F’ until an appeal to write the deferred final exam is granted. A change of grade will be submitted when the deferred final exam has been written and the marks are available. See Academic Regulation 2.3 for the official meanings of these grades.

## 8. Other information

Accommodation Students with disabilities needing academic accommodation are required to contact a coordinator at the Paul Menton Centre to complete the necessary *letters of accommodation*. To ensure that sufficient time is available to make arrangements, the student must then make an appointment to discuss their needs with the instructor at least two weeks prior to any necessary accommodation.

Students requiring academic accommodation due to a religious obligation or who are pregnant or who become pregnant should also feel free to come and discuss their concerns with the instructor. They are also strongly encouraged to contact Equity Services to obtain the necessary *letters of accommodation* as soon as possible.

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[6 ] [www.carleton.ca/economics/courses/writing-preliminaries](http://www.carleton.ca/economics/courses/writing-preliminaries)