

Course number	G-AGR06 7FC10 LE82				
Course title (and course title in English)	生物資源經濟学特別講義 VIA Special Lecture on Natural Resources Economics VIA		Instructor's name, job title, and department of affiliation	Part-time Lecturer,Subal C. KUMBHAKAR Part-time Lecturer,ABDUL MALEK, Mohammad	
Target year	1st year students or above	Number of credits	1	Year/semesters	2020/Intensive, First semester
Days and periods	Intensive	Class style	Lecture	Language of instruction	English
[Overview and purpose of the course]					
<p>【This intensive course, themed “ Productivity and Efficiency Measurement, ” will be jointly taught by Prof. Subal C Kumbhakar, Distinguished Professor of Economics at State University of New York at Binghamton and Dr. Mohammad Abdul Malek, Associate Professor at University of Tsukuba】 .</p> <p>***** *****</p> <p>Conventional neoclassical paradigm assumes that all firms operate rationally and efficiently. This is, however, not the case in reality. Firms, no matter, what type of business they are involved often fail to operate with their full potential. The course challenges the neoclassical assumption of full efficiency and presents concepts, models and tools needed to analyze and quantify the levels of inefficiency and productivity at a point in time and their movement over time for each firm.</p> <p>Presence of inefficiency results in lower output, higher cost, lower profit. Thus, it is important to know the extent of inefficiency and how it affects output, cost, revenue, profit, etc. Also the factors that might affect these inefficiencies.</p> <p>This course uses an econometric approach (known as stochastic frontier approach) to identify and estimate the magnitude and possible sources of inefficiency using both cross-sectional and panel data. The focus will be mostly on technical inefficiency and its determinants.</p> <p>The course also examines the impact of inefficiency on productivity growth (TFP) and profitability. We also address issues related to undesirable output and environmental efficiency. Finally, we show Stata software can be used to estimate inefficiency using a variety of models.</p>					
[Course objectives]					
<p>At the end of the course the participants are expected to learn:</p> <ul style="list-style-type: none"> - What is inefficiency and how to model and estimate it econometrically; - Characterizations of efficiency and productivity growth from a production function perspective; - Modelling and estimating determinants of inefficiency in a production framework; - Panel data models and decomposition of productivity growth that explicitly accounts for the presence of inefficiency; - Modelling production processes with undesirable outputs and estimating environmental efficiency. - How to use of Stata to estimate Stochastic Frontier Models (Cross section and Panel) and interpret the results. 					
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[Course schedule and contents]

The tentative schedule of this intensive lecture course is as follows:

July 4 (Sat): L1(14:45-16:15) by Dr. Malek

July 5 (Sun): L2 (8:45-10:15), L3 (10:30-12:00), L4 (14:45-16:15) by Prof. Kumbhakar

July 6 (Mon): L5 (10:30-12:00) by Dr. Malek

July 7 (Tue): L6 (8:45-10:15), L7 (10:30-12:00), L8 (13:00-14:30) by Prof. Kumbhakar

July 8 (Wed): L9 (8:45-10:15), Exam (10:30-12:00) by Prof. Kumbhakar

Venue:

July 4-7: W222 (Computer Lab)

July 8: W402 (Lecture Room)

Lecture 1) Lab setup with Stata

Lecture 2) Production function, its properties, some specific production functions; Modeling inefficiency in the production function: input and output oriented inefficiency; Identification and estimation of inefficiency in cross-sectional models using SFA.

Lecture 3) Estimating firm-specific inefficiency with (i) normal and half-normal distributions, (ii) normal and exponential distributions, and (iii) normal and truncated normal distributions.

Lecture 4) Lab session. (i) Basics of Stata. (ii). Estimation/Inference in Cross-Sectional SF models.

Lecture 5) Lab session: Stata Session: Estimation of inefficiency with determinants.

Lecture 6) Introduce determinants of inefficiency

(i) via the mean/variance of inefficiency, (ii) via the scaling function, (iii) the marginal effects of determinants.

Lecture 7) Panel Data Methods

(i) Endogeneity in SF model (cross section and panel models)

(ii) Maximum Likelihood Estimation with inefficiency

Lecture 8) Panel Data Methods (advanced)

(i) Determinants of inefficiency

(ii) Separating firm-effects from inefficiency

(iii) More advanced panel models

Stata Lab session: Estimation of panel SF models

Lecture 9) TFP decomposition with inefficiency; Decomposition using production function, Decomposition using cost function, TFP and profitability.

Exam: Verbal one-to-one question answer session

[Course requirements]

Lectures will be in English. Reading, class participation activities, and exam will be in English.

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[Evaluation methods and policy]

Class participation, Stata homework, Exam (question/answer verbal #8211 no written exam).

Refer to "2020 Guide to Degree Programs" for attainment levels of evaluation.

[Textbooks]

A Practitioner ' s Guide to Stochastic Frontier Analysis Using Stata by Kumbhakar, Wang and Horncastle (2015), Cambridge University Press.

Download demo Stata applications that are in the book from

<https://sites.google.com/site/sfbook2014/home/for-stata-v12-v13-v14>

Stata exercises will be from the book mostly from chapters 2, 3, 5, 10 and 11.

[References, etc.]

(Reference books)

Stochastic Frontier Analysis by Kumbhakar and Lovell (2000), Cambridge University Press.

Battese, G.E. and T.J. Coelli (1992), " Frontier Production Functions, Technical Efficiency and Panel Data: With Application to Paddy Farmers in India, " Journal of Productive Analysis 3:1/2 (June), 153-69.

Battese, G.E. and T.J. Coelli (1995) " A Model for Technical Inefficiency Effects in a Stochastic Frontier Production Function for Panel Data, " Empirical Economics 20, 325-32.

Greene, W. The Econometric Approach to Efficiency Analysis, " Chapter 2 in The Measurement of Efficiency, H Fried, C.A.K. Lovell and S. Schmidt, eds., Oxford University Press, 2008.

Jondrow, J., C.A.K. Lovell, I.S. Materov, and O. Schmidt (1982), " On the Estimation of Technical Inefficiency in the Stochastic Frontier Production Function Model, " Journal of Econometrics 19:2/3 (August), 233-38.

Kumbhakar, S.C., Wang, H-J, and A. Horncastle (2010), " Estimation of Technical Inefficiency in Production Frontier Models Using Cross-Sectional Data, " Indian Economic Review 45: 2, 7-77.

Kumbhakar, S.C. (1990), " Production Frontiers, Panel Data, and Time-Varying Technical Inefficiency, " Journal of Econometrics 46:1/2 (October/November), 201-12.

Kumbhakar, S.C. (2001), Estimation of Profit Functions When Profit Is Not Maximum, American Journal of Agricultural Economics 83:1 (February), 1-19.

Kumbhakar, S. (2011) Estimation of production technology when the objective is to maximize return to the outlay, European Journal of Operation Research, 208, 170-176.

Kumbhakar, S.C., Lien, G. and J.B. Hardaker (2014), Technical efficiency in competing panel data models: A study of Norwegian grain farming, Journal of Productivity Analysis

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Kumbhakar, S.C. and K. Sun (2012), Estimation of TFP Growth: A Semiparametric Smooth Coefficient Approach, *Empirical Economics*.

Kumbhakar, S.C. and Lien, G., Productivity and profitability decomposition: A parametric distance function approach, *Food Economics - Acta Agricult Scand C* 6 (2009), 143-155.

Kumbhakar, S.C., Mydland, O., Musau A. and Lien, G. (2020) Disentangling Costs of Persistent and Transient Technical Inefficiency and Input Misallocation: The Case of Norwegian Electricity Distribution Firms (with Mydland, Musau and Lien), *Energy Journal* (2020), 41(3).DOI: 10.5547/01956574.41.3.skum

Kumbhakar, S.C., Lien, G. and Alem, H. (2018), Endogeneity, heterogeneity, and determinants of inefficiency in Norwegian crop-producing farms, *International Journal of Production Economics*, 201, 53#821161.

Kumbhakar, S.C and Parmeter, C. (2019), Implementing Generalized Panel Data Stochastic Frontier Estimators in Panel Data Econometrics Theory, Chap 9, pp 225-246 (Ed. Tsionas, Elsevier).

Kumbhakar, S.C and Tsionas, M. (2016), The Good, The Bad and The Technology: Endogeneity in Environmental Production Models, *Journal of Econometrics* (2016), 190, 315-327.

Kumbhakar, S.C., Lien, G. and Hardaker, B. (2014), Technical efficiency in competing panel data models: A study of Norwegian grain farming, *Journal of Productivity Analysis* 41, 2014, pp 321#8211337, DOI 10.1007/s11123-012-0303-1.

Lai, H-p. and Kumbhakar, S.C. (2018), Endogeneity in Panel Data Stochastic Frontier Model with Determinants of Persistent and Transient Inefficiency (with Hung-pin Lai), *Economics Letters*, 162, 5-9.

Schmidt, P. and C.A.K. Lovell (1979), " Estimating Technical and Allocative Inefficiency Relative to Stochastic Production and Cost Frontiers, *Journal of Econometrics* 9, 342-66.

Wang, H-J. (2002), " Heteroscedasticity and Non-Monotonic Efficiency Effects of a Stochastic Frontier Model, " *Journal of Productivity Analysis* 18:3 (November), 241-53.

Wang, H-J. and P. Schmidt (2002), " One-Step and Two-Step Estimation of the Effects of Exogenous Variables on Technical Efficiency Levels, " *Journal of Productivity Analysis* 18:2 (September), 129-44.

[Study outside of class (preparation and review)]

Read chapters 2, 3, 5, 10 and 11 from the Kumbhakar, Wang and Horncastle (2015) book.

(Other information (office hours, etc.))

Please regularly check the website of the Division of Natural Resource Economics for updated information.
<http://www.reseco.kais.kyoto-u.ac.jp/en/news/>

*Please visit KULASIS to find out about office hours.