CERGE-EI

Charles University Prague
Center for Economic Research and Graduate Education
and
the Economic Institute of the Academy of Sciences of the Czech Republic

Course Book for the Academic Year 2014-2015

Fall Semester

MA/PhD Study Affairs Office

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CONTENTS

I. THE STRUCTURE OF PH.D. STUDIES IN ECONOMICS AT CERGE

The Center for Economic Research and Graduate Education (CERGE) is a research and educational institute of Charles University. In close cooperation with the Economics Institute (EI) of the Academy of Sciences of the Czech Republic, CERGE offers a Ph.D. program in Economics, accredited by the Ministry of Education, Youth and Sport of the Czech Republic, Economic research is an integral part of CERGE activities.

A. *Contents and Organization of Graduate Study at CERGE*

The basic mission of CERGE is to perform graduate studies in Economics and to train future university faculty and researchers and public administration representatives. The main idea of establishing the doctoral program curriculum is to transfer the modern Western system of Ph.D. study in Economics, as it is applied in the United States and some Western European countries, to the local environment and incorporate it into the structure of Czech university education within Charles University. The program offers economic education at a level comparable with world standards directly at Charles University, without the necessity of more expensive study abroad. Besides this fact, the best students may be offered the opportunity to visit (for up to one academic year) an appropriate university in the United States or Western Europe. This experience may enlarge their scope of knowledge significantly.

During the first two years of study courses are taught by the local and visiting faculty. Studies are conducted entirely in English. The duration of the doctoral study is four years. The first two years offer primarily systematic knowledge of theory; for the latter two years the students work on their dissertation. The transfer from study to independent research work is gradual and begins during the second year of study.

Further details on the program can be found in the handbook for graduate students.

B. *Core Study – The First Two Years*

In the first year of study the students follow a common curriculum designed to provide a strong foundation in Microeconomic Theory, Macroeconomic Theory, Statistics and Econometrics, and Academic Writing. This curriculum is standard for the PhD study in Economics. The study is divided into three semesters: the fall semester (FS), the spring semester (SS), and the summer semester (SuS). In view of the fact that many newly recruited students do not have an extensive background in modern Economics equivalent to "western" standards, and also that their knowledge of Mathematics and English are frequently at different levels, a preparatory semester is organized for potential students. It allows CERGE to provide the students with some basic tools as an introduction to the program and to achieve a standard level of competence.

The second year of formal study at CERGE provides students with the opportunity to investigate more specific fields of interest. Several courses are offered each of the two semesters, and the second year students must enroll for a minimum of three, plus a course in English. The students participate in a seminar series and are now expected to begin their own research.

Having completed both the first and second years, students must pass a General (comprehensive) examination. After the first year, the students must pass Microeconomic Theory, Macroeconomic Theory, and Econometrics; after the second year they must show proficiency in at least two specialized fields by passing General (field) exams in their chosen areas of interest.

During the first two years of study the students do not have a special supervisor; rather, they rely on the advice of the Deputy Director of Graduate Studies, who is also one of the CERGE faculty members. The program and organization of graduate study is regulated by a CERGE's Graduate Council (GC).

C. *Specialized Study – Third and Fourth Years*

During the spring semester of the second year and the fall semester of the third year, the students have to choose the topic of their dissertations. A tentative chair as a supervisor is then assigned. By the middle of the third year (at the latest), they formulate a thesis proposal and public defense is required together with state doctoral examination. For students who passed all General examinations with distinction, the main importance will be placed on the defense of the thesis proposal. Those with less than distinctive examination results can also expect additional detailed questions from respective fields. After having successfully defended the proposal, a three-member dissertation committee is appointed which guides and supervises the study and research work.

Under the guidance of this committee the student works on his or her dissertation. In the fourth year the students present their third year work at the Dissertation workshop and prepare for the defense of the dissertation. The study is concluded by the public defense of the doctoral dissertation.

D. *Study Program*

Here we present the courses designed for the preparatory semester and the first and second year of study. (One lecture/exercise unit is 45 minutes long.)

Preparatory semester

Subject	**(Lecture hours / exercise hours)**
Macroeconomics 0	4/2, Exam
Microeconomics 0	4/2, Exam
Mathematics	4/2, Exam

***Notes**: Upon completion of the preparatory semester, the final selection of students is made to enter the doctoral program in the fall, based on final exam results.*

First year

Subject	Fall	Spring	Summer
Microeconomics I, II, III	4/2, Exam	4/2, Exam	4/2, Exam
Macroeconomics I, II, III	4/2, Exam	4/2, Exam	4/2, Exam
Statistics / Econometrics I, II	4/2, Exam	4/2, Exam	4/2, Exam
Academic Writing I	---	4/0 Credit	---

***Notes**: After completing the first year, each student must pass the General examination in the fields of Microeconomics, Macroeconomics and Econometrics.*

Second Year

Subject	Fall	Spring	Summer
Econometrics III, IV	4/2, Exam	4/2, Exam	---
Industrial Organization	4/2, Exam	---	---
Advanced Game Theory	---	4/2, Exam	---
Financial Markets I, II	4/2, Exam	4/2, Exam	---
Empirical Methods	4/2, Exam	---	---
Labor Economics	---	4/2, Exam	---
Energy Economics	4/2, Exam	---	
Network Economics	---	4/2, Exam	
Macro Topics I, II	4/2, Exam	4/2, Exam	---
Academic Writing II	4/0, Credit	---	---
Research Method Seminar	Mandatory	Mandatory	Mandatory
Combined Skills I	---	4/0, Credit	---
Research Seminars	0/2, Credit	0/2, Credit	---
Directed Research	---	---	0/2, Credit
Combined Skills II – M.A.	---	---	0/2, Credit

***Notes**:*
** Second-year students choose at least three (exam-ended) courses per semester. The courses cannot be from the same field. Courses offered may differ slightly from year to year, depending on the faculty in residence.*
** The credits for English courses, the Research Seminars and Directed Research are mandatory.*
** The credit for Research Method Seminar will be awarded based on individual consultations with the instructors and based on individual written work.*
** After completing the second year each student must pass General exam in two fields. Upon agreement of CERGE, a student may complete part of his/her study at another university - this is valid not only for individual courses, but also for a whole study year.*
** Topic courses are one semester courses not forming two semester sequence and do not cover comprehensively all material needed for Field General Exam.*
** Combined Skills ll – M.A. is for M.A. students only, a paper or report appropriate for the MA-degree writing requirement.*

Third year

Subject	Fall	Spring	Summer
Combined Skills ll – Ph.D.	Credit	---	---

***Notes**: Normally, students must pass the 2-year MA program first as a pre-requisite for registering in CSll-Ph.D.*

II. SYLLABI OF THE FALL SEMESTER COURSES

A. *First year courses*

MICROECONOMICS I

Lecturer:

Jan Zápal

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Teaching assistants:

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Dali Tsintskiladze

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Office hours:

see the office door

Course objectives

This is the first course in the microeconomics sequence. The objective of the sequence in general and of the course in particular is to i) provide students with firm knowledge of the basic microeconomic theory, ii) provide students with grasp of relevant (micro)economic concepts on intuitive and formal level and iii) equip students with tools and techniques allowing them to conduct their own independent research.

The course is based on 24 90-minutes lectures and 12 90-minutes classes (exercise sessions). Two lectures and one class take place in any given week.

12 weekly problem sets are integral part of the course. Students are required to complete one problem set per week and hand it in before each class (details to be specified). The classes will be devoted to the discussion of problem set solutions. Team-work on the problem sets is encouraged. Free-riding on the effort of team-mates is not work on the problem sets is essential for grasping the course material and for exam preparation.

Course outline

1. Consumption
- Preference & Choice (MWG 1)
- Consumer Choice (MWG 2)
- Classical Demand Theory (MWG 3)
- Choice under Uncertainty (MWG 6)

2. Production
- Production (MWG 5)

3. Markets

- Competitive Markets (MWG 10)
- Externalities and Public Goods (MWG 11)
- Market Power (MWG 12)

Requirements and grading

Grades will be based on final exam only. The final exam will take place in week 13 (details to be specified). There will be midterm exam in week 6 or 7 (details to be specified) with structure similar to the final exam and hence indicative of students' standing in the course. In addition students are required to hand in 12 weekly problem sets.

Readings

Principal textbook:

Mas-Colell, Andreu; Michael D. Whinston and Jerry R. Green. Microeconomic Theory. Oxford: Oxford University Press, 1995.(henceforth MWG)

Reference (not required) books:

Microeconomic:

Jehle, Geoffrey A. and Philip J. Reny. Advanced Microeconomic Theory. Essex: Pearson Education Limited, 2011.

Varian, Hal R. Microeconomic Analysis. London: W. W. Norton & Company, 1992.

Mathematical:

Aliprantis, Charalambos D. and Kim C. Border. Infinite Dimensional Analysis: A Hitchhiker's Guide. Berlin: Springer, 2007.

Border, Kim C. Fixed Point Theorems with Applications to Economics and Game Theory. Cambridge: Cambridge University Press, 1989.

Dixit, Avinash K. Optimization in Economic Theory. Oxford: Oxford University Press, 2002.
Duggan, John. Basic Concepts in Mathematical Analysis.
https://dl.dropboxusercontent.com/u/17516137/RapidWeaverSite/resources/lecturenotes/MathHandbook13.pdf, 2013.

Chiang, Alpha C. Fundamental Methods of Mathematical Economics. London: McGraw-Hill, 1984.
McLennan, Andrew. Advanced Fixed Point Theory for Economics.
http://cupid.economics.uq.edu.au/mclennan/Advanced/advanced_fp.pdf, 2014.

Simon, Carl P. and Lawrence Blume. Mathematics for Economists. London: W. W. Norton & Company, 1994.

Takayama, Akira. Mathematical Economics. Hinsdale, IL: Dryden Press, 1974.Huang, Chi-fu and Robert H. Litzenberger, Foundations for Financial Economics, North-Holland, 1988.

Game theory:

Fudenberg, Drew and Jean Tirole. Game Theory. London: MIT Press, 1991.

Maschler, Michael; Eilon Solan and Shmuel Zamir. Game Theory. Cambridge: Cambridge University Press, 2013.

Myerson, Roger B. Game Theory: Analysis of Conflict. London: Harvard University Press, 1991.

Osborne, Martin J. and Ariel Rubinstein. A Course in Game Theory. London: MIT Press, 1994.

MACROECONOMICS I / Part I

Lecturer:

Sergey Slobodyan

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Teaching assistants:

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Office hours:

TBA

Course information

The first part of the first course in the macroeconomic theory sequence will concentrate on developing the tools and concepts necessary to understand the modern macroeconomic theory — discrete time dynamic programming and continuous time optimal control. The study of specific models will take a back seat to mastering the techniques. We will make use of MATLAB to utilize basic numerical methods of solving the problems.

Grading

About 30% of the total score for this part will be based on homeworks and class participation, with the rest determined at the midterm exam.

Reading List and Course Outline

Major Textbooks

B D. Bertsekas: *Dynamic Programming and Optimal Control*, Athena Scientific, 2005.

LS Ljungquist, Lars, and Thomas J. Sargent: *Recursive Macroeconomic Theory, 2nd ed.*,Cambridge: MIT Press, 2004.

M George McCandles: *The ABCs of RBCs: An Introduction to Dynamic Macroeconomic Models.* Cambridge: Harvard University Press, 2008.

Additional Textbooks

AC Ada, Jerome and Russell Cooper. Dynamic Economics. MIT Press, 2003.

BF Blanchard, O. and S. Fisher: *Lectures on Macroeconomics*. MIT Press, 1989.

SL Stokey, Nancy L., Robert E. Lucas, Jr., and Edward C. Prescott: *Recursive Methods in Economic Dynamics*. Cambridge: Harvard University Press, 1989.

0. Overview of the Macroeconomics (for bedtime reading).
- ✓ Blanchard, O., "What Do We Know About Macroeconomics that Fisher and Wicksell Did Not?" QJE, November 2000, 115:4, 1375-1410.
- ✓ Blanchard, O., "The State of Macro", NBER WP 14259.
- ✓ Woodford, M., "Revolution and Evolution in Twentieth-Century Macroeconomics," Available at http://www.columbia.edu/~mw2230/macro20C.pd.

I. Discrete Time Dynamic Programming: Finite and Infinite Horizon
- ✓ B Volume 1, Chapter 1.
- ✓ SL Chapters 1-4, LS Chapters 3-4.

II. Numerical Solution Methods

IIa. Value Function Iteration
- ✓ LS Chapter 4.

Applications:
Consumption and Savings – discrete time.
- ✓ M Chapter 3.

One-Sector Model of Economic Growth
- ✓ SL Chapter 5.1, 5.4, 5.7, LS Chapter 11.

IIb. Policy Function Iteration
- ✓ LS Chapter 4.

Application:
Search Model.
- ✓ LS Chapter 6.3.

IIc. Log-Linearization, Method of Undetermined Coefficients, Blanchard-Kahn
Application:
RBC Model
- ✓ M Chapters 1, 6.

IId. Linear-Quadratic Problem
- ✓ LS Chapter 5, M Chapter 7

Application:
- ✓ Monetary Policy

III. Markov Chains
- ✓ LS Chapter 8, AC Chapter 3.

IV. Continuous-Time Optimal Control
Application:
Consumption and Savings – Continuous Time
- ✓ BF Chapter 2.

MACROECONOMICS I / Part II

Lecturer:

Michal Kejak

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Teaching assistants:

TBA

Office hours:

TBA

Course information

Recursive methods constitute a powerful approach to dynamic economics due to their described focus on a tradeoff between the current period's utility and a continuation value for utility in all future periods.
This part of the course will continue to revolve around additional main ideas: the competitive equilibrium model of a dynamic stochastic economy, complete markets and incomplete markets. This model is a foundation for asset pricing theory, growth theory, real business cycle theory, and normative public finance. In order to introduce fiat money in this model the model has to be modified. The shopping time model is then used to explain ten doctrines of monetary economics.

Course outline

- Equilibrium with Complete Markets -- [Ch.8 in LS2]
- Ricardian equivalence -- [Ch.10 in LS2]
- Fiscal Policies in Growth Model - [Ch. 11 in LS2]
- Recursive Competitive Equilibria - [Ch.12 in LS2]
- Asset Pricing - [Ch.13 in LS2]
- Fiscal-Monetary Theories of Inflation - [Ch. 24 in LS2]
- Growth Models [BS]
    - Sollow Growth Model
    - Ramsey Growth Model, Beta Convergence
    - AK Endogenous Growth Models

Requirements and grading

There will be two exams in the course, a two hour midterm exam in the first half of the course and a two hour final exam in the second half of the course. There will also be weekly problem sets. Problem sets and class participation will count for 15% of the course grade, and the midterm exam will count for 35 % of the course grade. The total for the second half is 50% of the course grade.

Readings

We will use the books below together with journal articles which will be specified in a more detailed syllabus.

(LS2) Ljungquist, Lars and Thomas J. Sargent: Recursive Macroeconomic Theory. Second Edition. MIT Press. 2004.

(BS) Barro, Robert and Xavier, Sala-i-Martin: Economic Growth. Second Edition, MIT Press. 2003.

STATISTICS

Lecturers:

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Teaching assistants:

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Office hours:

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Course information

The goal of the course is to give students a deeper understanding of the statistical theory and practice and to build up a background for econometric analysis. The emphasis of this course is on the principles of probability theory, stochastic processes, and statistical inference.

Course outline

- Introduction to probability theory, set concepts and operations, probability set functions, counting rules, conditional probability and independence, Bayes' rule.
- Random variables, cumulative density functions, probability density functions.
- Expectations of random variables, moments and moment generating functions.
- Uniform distribution, Binomial distribution, Poisson distribution, Normal distribution.
- Systems of random variables, random vectors, joint cumulative density function, joint probability densitity functions, marginal probability density functions, expectations transformation of variables, conditional distributions, independence, covariance and correlation.
- Introduction to asymptotic theory, convergence in probability and distribution, law of large numbers, central limit theory.
- Bivariate normal distribution, t distribution, chi-squared distribution, F distribution
- Introduction to inferential statistics, random sampling, unbiasedness and consistency, confidence intervals, mean square error.
- Methods of moments.
- Introduction to hypothesis testing.
- Maximum likelihood estimation.
- Maximum likelihood tests, Wald and Score test.
- (time permitting) Ordinary Least Square estimation.

Requirements and grading

Problem Sets and Written Assignments (10%), Midterm Exam (40%), Final Exam (50%).

The following grading scale will be used: 94% of points or more=A+, 88-94%=A, 83-88%=A-,77-83% B+, 72-77%=B, 66-72%=B-, 61-66%= C+, 55-61%=C, 50-55% C-, less than 50%=F.

Readings

Hogg, R.V., McKean J. and A. T. Craig (2012). *Introduction to Mathematical Statistics*, Prentice Hall, 7th edition.

Casella, G., and R.L.Berger (2002). *Statistical Inference*, Duxbury Press, Belmont

B. *SECOND YEAR STUDENTS*

ECONOMETRICS III

Lecturer:

Michal Franta

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Michal Kejak

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Michal Pakoš

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Teaching assistant:

TBA

Office hours:

TBA

Course information

This course is a part of the sequence in econometrics. The course will focus mainly on the models that use time series and will review several topics from current state of theory and empirical work. The course is an applied econometrics course in nature and therefore it will stress application of the topics into applied research. The course will cover topics listed in the course outline below.

Course outline – Michal Franta

1) **Stationary Univariate Models**
   - Brief introduction (Enders, Ch. 2)
   - Application: Inflation persistence (Marques, 2004, Dossche and Everaert, 2005).
2) **Introduction to Bayesian Econometrics**
   - Normal linear regression model (Koop, Ch. 1-3).
3) **Vector Autoregressions**
   - Introduction (Canova, 2007, Ch. 4, Enders, Ch. 5).
   - Bayesian VARs (Canova, 2007, Ch. 10, Koop and Korobilis, 2009).
   - Application: Monetary VARs (VARs: Sims, 1992, BVARs: Koop and Korobilis, 2009, FAVARs: Bernanke et al., 2005).
4) **Models With Trend**
   - Trends in macroeconomic modeling.
   - Unit roots (Enders, Ch. 4).
5) **Cointegration and Vector Error Correction Models**
   - Introduction (Enders, Ch. 6).
   - Application: Demand for money (Calza et al., 2001).
6) **Econometric Methods for Mixed-Frequency Data**
   - Introduction (Foroni and Marcellino, 2013).
   - Application: GDP nowcasting/forecasting (Mariano and Murasawa, 2010).
7) **Non-Linear Time-Series Models**
   - Introduction to non-linear time series models and their estimation (Enders, Ch. 11).
   - Application: Changes in monetary policy transmission (Primiceri, 2005).
   - Application: Modeling non-linearities between credit and economic activity (Balke, 2000).
8) **Selected Issues Related to Great Recession**

- Implications for forecasting and modeling (Ng and Wright, 2013, Stock and Watson, 2012).

Readings

Balke, N.S. (2000). Credit and Economic Activity: Credit Regimes and Nonlinear Propagation of Shocks, *Review of Economics and Statistics*, 82(2), 344-349.

Bernanke, B., Boivin, J. and P. Eliasz (2005): "Measuring the Effects of Monetary Policy: A Factor-Augmented Autoregressive (FAVAR) Approach", *Quarterly Journal of Economics*, 120, 387-422.

Calza, A., Gerdesmeier, D., and J. Levy (2001): „Euro Are Money Demand: Measuring the Opportunity Costs Appropriately", IMF Working Paper 01/179.

Canova, F. (2007): "Methods for Applied Macroeconomic Research", Princeton University Press.

Dossche, M. and G. Everaert (2005): "Measuring Inflation Persistence: A structural Time Series Approach", ECB WP 495.

Enders, W. (2004): "Applied Econometrics Time Series", Wiley Series in Probability and Statistics.

Foroni, C. and M. Marcellino (2013): "A Survey of Econometric Methods for Mixed-Frequency Data", Norges Bank Working Paper 06/2013.

Koop, G. (2003): "Bayesian Econometrics", Wiley.

Koop, G. and D. Korobilis (2010): "Bayesian Multivariate Time Series Methods for Empirical Macroeconomics", mimeo, University of Strathclyde.

Mariano, R.S. and Y. Murasawa (2010): "A Coincident Index, Common Factors, and Monthly Real GDP", *Oxford Bulletin of Economics and Statistics*, 72(1), 27-46.

Marques, C.R. (2004): "Inflation Persistence: Facts or Artefacts?", ECB WP No. 371.

Ng, S., and J. H. Wright (2013): "Facts and Challenges from the Great Recession for Forecasting and Macroeconomic Modeling", *Journal of Economic Literature*, 51(4), 1120-1154.

Primiceri, G. (2005): "Time Varying Structural Vector Autoregressions and Monetary Policy", *Review of Economic Studies*, 72(3), 821-852.

Sims, C. (1992): "Interpreting the macroeconomic time series facts: The effects of monetary policy", *European Economic Review* 36, 975-1011.

Stock, J.H., and M.W. Watson (2012): "Disentangling the Channels of the 2007-09 Recession", Brooking Papers on Economic Activity, Spring 2012, 81-135.

Course outline – Michal Kejak

Main topics:

- Estimating DSGE Models by the use of DYNARE.
  - Basics of DYNARE.
  - Introduction to estimation of DSGE models by Bayesian methods.
  - Examples of the use of DYNARE for the estimation of DSGE models.

Readings

Barillas, F., A. Bhandari, R. Colacito, S. Kitao, C. Matthes, T. J. Sargent, Y. Shin (2010): Practicing Dynare, mimeo.

DeJong, D. N., Dave, C. Structural Macroeconomics. Second edition. Princeton University Press. 2011 (Chap.10).

DYNARE – User's Guide.

Fernández-Villaverde, J. and J. Rubio-Ramírez (2004). .Comparing Dynamic Equilibrium Models to Data: a Bayesian Approach..Journal of Econometrics, 123, 153-187.

Fernández-Villaverde, J. and J. Rubio-Ramírez (2005). .Estimating Dynamic Equilibrium Economies: Linear versus Nonlinear Likelihood..Journal of Applied Econometrics, 20, 891-910.

Fernández-Villaverde, J. and J. Rubio-Ramírez (2007). .Estimating Macroeconomic Models: A Likelihood Approach..Review of Economic Studies 74, 1059-1087.

Schorfheide, F. (2000): "Loss function-based evaluation of DSGE models, "Journal of Applied Econometrics, 15(6), 645–670.

Course outline – Michal Pakoš

Main topics:

- Classical and Gibbs-Sampling Approach (Kim and Nelson book).
    - Markov-Switching Models.
    - State-Space Models with Markov Switching.

Readings

Casella, George; George, Edward I. (1992), Explaining the Gibbs sampler. The American Statistician 46 (3): 167–174.

Chang-Jin Kim and Charles R. Nelson, State-Space Models with Regime Switching: Classical and Gibbs-Sampling Approaches with Applications, MIT Press 1999.

James H. Albert and Siddhartha Chib, Bayes Inference via Gibbs Sampling of Autoregressive Time Series Subject to Markov Mean and Variance Shifts, Journal of Business & Economic Statistics, Vol. 11, No. 1 (Jan., 1993), pp. 1-15.

Diebold, X. Francis and Glenn D. Rudebusch, Business Cycles, Princeton University Press 1999.
Gelfand, Alan E. , Gibbs Sampling, Journal of the American Statistical Association, Vol. 95, No. 452. (Dec., 2000), pp. 1300-1304.

Hamilton, James D, 1989. A New Approach to the Economic Analysis of Nonstationary Time Series and the Business Cycle, Econometrica, Econometric Society, vol. 57(2), pages 357-84, March.

Hamilton, James D., 1990. Analysis of time series subject to changes in regime, Journal of Econometrics, Elsevier, vol. 45(1-2), pages 39-70.

Engel, Charles & Hamilton, James D, 1990. Long Swings in the Dollar: Are They in the Data and Do Markets Know It?, American Economic Review, American Economic Association, vol. 80(4), pages 689-713, September.

Hamilton, James D., Time Series, Princeton University Press 1994.

Hamilton, James D & Gang, Lin, 1996. Stock Market Volatility and the Business Cycle, Journal of Applied Econometrics, John Wiley & Sons, Ltd., vol. 11(5), pages 573-93, Sept.-Oct.

Requirements and grading

Grades will be based on student's performance in midterm exam, final exam, and home assignments. Course will consist of two grading periods with cut-off point at midterm exam.

1. Midterm exam + home assignments: 40% + 10%.
2. Final exam + home assignments: 40% + 10%.

The exercise sessions will be scheduled according to amount of topics covered and sessions will be announced in advance.

INDUSTRIAL ORGANIZATION

Lecturer:

Avner Shaked

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Jakub Steiner

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Krešimir Žigić

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Teaching assistant:

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Office hours:

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Course information

The first part of the course focuses on the role of information in economic modeling. We will read and discuss papers featuring informational asymmetries, and study their consequences on both micro and macroeconomic behavior. On the theoretical level, the course will introduce you to the modeling framework of global games, and beauty contest games. On the level of applications, we will see bank runs, debt pricing, financial bubbles, issues of central banking, and some other applications related to industrial organization.

The second part of the course (Introduction to IO) is (broadly) about the economic study of firm behaviour and market structure. The goal is to familiarize students with the major topics in IO, notably

core oligopoly theory and in parallel, to illustrate methodological tools for conducting research. The main focus will be on theoretical issues. We will cover several subjects like the introduction to the oligopoly theory, as well as the idea of product differentiation, advertising and choice under bounded rationality.

Requirements and grading

The course will be accompanied by exercise sessions. The course grade will be based on a performance on both parts of the course; there will be an exam for each part of the course, and each exam counts as 50% of the total grade.

Readings

1st part:

Morris, Stephen and Shin, Hyun S. “Global Games: Theory and Applications.” In: Dewatripont, M., Hansen, M., Turnovsky, S. (Eds), Advances in Economics and Econometrics (Proceedings of the Eighth World Congress of the Econometric Society), Cambridge University Press, 2003.

Morris, Stephen and Shin, Hyun S. “Unique Equilibrium in a Model of Self-Fulfilling Currency Attacks.” American Economic Review, 1998, 88 (3), 587–597.

Stephen Morris, and Hyun Song Shin, Contagious Adverse Selection, American Economic Journal: Macroeconomics 2012, 4(1): 1–21.

Goldstein, Itay and Pauzner, Ady. “Demand Deposit Contracts and the Probability of Bank Runs.” Journal of Finance, 2005, 60 (3), 1293–1327.

Sakovics J. and J. Steiner, Who Matters in Coordination Problems?, The American Economic Review, forthcoming.

F. Heinemann, R. Nagel, and P Ockenfels, The theory of global games on test: experimental analysis of coordination games with public and private information, 2004, Econometrica 72, 1583–1599.

Morris S.; Shin H.S. 2002, Social Value of Public Information, The American Economic Review 92, 1521-1534.

A. Bosch-Domènech, J. G. Montalvo, R. Nagel and A. Satorra, One, Two, (Three), Infinity, ... : Newspaper and Lab Beauty-Contest Experiments, The American Economic Review 92, 1687-1701.

Abreu, Dilip, and Markus K. Brunnermeier. "Bubbles and crashes."*Econometrica* 71.1 (2003): 173-204.

Philippe Jehiel, Analogy-Based Expectation Equilibrium

Philippe Jehiel, Milo Bianchi, "Financial reporting and market efficiency with extrapolative investors" (with) - July 2012

Eyster, E. and M. Piccione (2011). An approach to asset pricing under limited understanding.

2nd part:

Principal textbooks:
Tirole, Jean: *The Theory of Industrial Organization*, MIT Press, 1989 (henceforth, Tirole, 1989).

Belleflamme, P., and M. Peitz: *Industrial Organization—Markets and Strategies,* Cambridge University Press, 2010 (henceforth, Belleflamme and Peitz, 2010).

Osborne, J. M. and A. Rubinstein: *Bargaining and Markets*, Academic Press, 1990.

Etro, Federico: *Competition, Innovation and Antirust, A Theory of Market Leaders and Its Policy Implications*, Springer Verlag, 2007. (henceforth, Etro, 2007).

Recommended and supplementary textbooks:
Binmore, Ken: *Fun & Games*, D.C. Heath, 1992.

Fudenberg, Drew and Jean Tirole: *Game Theory*, MIT Press, 1991

Handbook of Industrial Organization Vol. I and II, eds. R. Schmalensee and R. Willig, Amsterdam: North-Holland, 1989.

Handbook of Industrial Organization Vol. III, eds. M. Armstrong and R. Porter, Amsterdam: North-Holland, 2007.

Martin, Stephen: *Advanced Industrial Economics*, Blackwell, 1993.

Mas-Colell, A., M. Whinston and J. Green (1995), *Microeconomic Theory*, Oxford University Press (henceforth, MWG, 1995).
Shy, Oz: *Industrial Organization, Theory and Applications*, The MIT Press, 1996.

Spiegler, R., Bounded Rationality and Industrial Organization, Oxford University Press, 2011.

Sutton, John: *Sunk Costs and Market Structure: Price Competition, Advertising, and the Evolution of Concentration*, MIT Press, 1991.

Vives, Xavier, Oligopoly Pricing; old ideas and new tools, The MIT Press, 2000, (henceforth, Vives, 2000).

Vives, Xavier, Information and Learning in Markets: The Impact of Market Microstructure, Princeton University Press, 2010

TOPICS: (this is a ***tentative*** outline of what we plan to cover in the Fall semester)

Product Differentiation, Advertising and Choice under Bounded Rationality
Belleflamme and Peitz, 2010, Chapter 6.

Spiegler, R., Bounded Rationality and Industrial Organization (2011), Oxford University Press, chapter 6.

Tirole, 1989, chapter 7.

Butters, R.G. (1977), “Equilibrium Distributions of Sales and Advertising Prices”, *Review of Economic Studies*, 44, 465-491.

d’Aspremont, C., J. J. Gabszewicz and J.-F. Thisse (1979), “On Hotelling's Stability in Competition,” *Econometrica*, 47, 1145-1150.

Hotelling, H. (1929), “Stability in Competition,” *Economic Journal*, 39, 41-57.

Salop, S. (1979), “Monopolistic Competition with Outside Goods,” *Bell Journal of Economics*, 10, 141-156.

Shaked, A. and J. Sutton (1982), "Relaxing Price Competition through Product Differentiation," *Review of Economic Studies*, 49, 3-13.

Shaked , A. and J. Sutton (1983), "Natural Oligopolies," *Econometrica*, 51, 1469-1483.

Models of Oligopolistic Competition
Etro, 2007; Chapters, 1-3

Tirole, 1989; Sections 5.1, 5.2, 5.4, 8.2.1.

MWG, 1995; Section 12.C.

Belleflamme and Peitz, 2010, Chapters, 3-4

Etro, F. (2006), "Aggressive Leaders," *Rand Journal of Economics*, 37, 146-154.

Novshek, W. (1985), "On the Existence of Cournot Equilibrium," *Review of Economic Studies*, 52, 85-98.

Etro, F. 2008, Stackelberg Competition with Endogenous Entry, *The Economic Journal*, Vol. 118, 531 (October), pp. 1670-97.

Shapiro, C. (1989), "Chapter 6: Theories of Oligopoly Theory," in: *Handbook of Industrial Organization Vol. I*.

Vives, 2000 Chapters 3, 4 and 5

FINANCIAL MARKETS I / Part I

Lecturer:

Aleš Černý

(cerny@martingales.info; office 329, phone 230)

Teaching assistant:

Mykola Babiak

(Mykola.Babiak@cerge-ei.cz)

Office hours:

Thursdays 18.9., 2.10. and 16.10.; 2-4pm

Course information

The aim of the course is to introduce students to the mathematical tools used in asset pricing and optimal portfolio allocation and to promote active use of the theory through simple numerical examples, some of which will be implemented in Matlab and/or Excel.

After a review of the basic concepts of the financial theory in one-period models, the course shall cover no arbitrage asset pricing in discrete time, introducing financial and mathematical notions such as state price density, self-financing strategy, change of numeraire, information filtration , martingale and change of measure. Having built a sufficient amount of intuition we will then proceed to apply these concepts in continuous time with the aid of the Ito formula and the Girsanov theorem. Several

examples will be given, among them derivation of the Black-Scholes formula, pricing of Asian options and Margrabe's option to exchange.

Pointers to the literature will be provided throughout the course.

Course outline

- One-period model of financial markets, arbitrage, state prices and risk-neutral probabilities
- Least squares hedging and CAPM
- Arbitrage and state prices in multiperiod models, martingale principle
- Information filtration, recombining trees, state variables, Markov property
- Change of measure, change of numeraire, self-financing strategies
- Optimal portfolio allocation in a dynamically complete market
- Towards continuous time
- Stochastic integral, Ito formula, drift and volatility, Gaussian processes
- Black-Scholes formula and pricing of more exotic derivatives
- Black-Scholes PDE and the general martingale principle, Feynman-Kac formula, HJB equations

Requirements and grading

Homeworks 25%
Midterm exam 75%

Readings

Cerny, A. (2009) Mathematical Techniques in Finance: Tools for Incomplete Markets. 2nd ed. Princeton University Press.

Huang, Chi-fu and Robert H. Litzenberger, Foundations for Financial Economics, North-Holland, 1988.

Duffie, Darrell, Dynamic Asset Pricing Theory, Princeton University, 1992.

FINANCIAL MARKETS I / Part II

Lecturer:

Fabio Michelucci

(fabiomichelucci@gmail.com; office 324, phone 117)

Teaching assistant:

TBA

Office hours:

TBA

Course information

The course will be based on some selective chapters from Jean Tirole's Theory of Corporate Finance.

The objective of the course is to provide a thorough coverage of some of the core problems in Corporate Finance and Corporate Governance and to illustrate the modeling tools that are typically used in the literature.

Even though the textbook will guide us through the literature, the course will be also be based on papers. Each student is expected to read the material that will be proposed before each class and to contribute to the discussion. Students will receive homework that will be solved during TA class, but will not be marked. They will also be required to present a paper.

Course outline

The plan is to cover roughly one chapter of Tirole's book per week and integrate the material in the book with some key related researcher papers.

Requirements and Grading

Final Exam: 75%.
Presentation 25%.

Please note that depending on the number of students enrolled, it might not be possible to run presentations. In that case, the exam would count for 100%
Problem sets will not be marked but students are strongly encouraged to solve them seriously.

Readings

Main Textbook:
Tirole, The Theory of Corporate Finance

Useful books:
Ross, Westerfield, and Jordan, Fundamentals of Corporate Finance (undergraduate level book to familiarize with the main concepts in Corporate Finance).

De Matos, Theoretical Foundations of Corporate Finance (Only covers some selected topics).

Bolton and Dewatripont, Contract Theory; Laffont and Martimort, The Theory of Incentives; Salanie, The Economics of Contracts; (these three books are useful for a better understanding of principal-agent problems. The third one is more introductory).

Freixas and Rochet, Microeconomics of Banking (for a more detailed expositions of the literature on banking)

Hart, Firms, Contracts and Financial Structure (very good for the Property Right Approach to Corporate Finance)

EMPIRICAL METHODS

Lecturer:

Patrick Gaulé

(patrickgaule@gmail.com; office 318, phone 191)

Teaching assistant:

TBA

Office hours:

TBA

Course information

This course seeks to familiarize second year PhD students to reduced-form empirical research with an emphasis on identification techniques and practical examples. At the end of the course, students should be able to recognize threats to identification and to formulate identification strategies. Various other issues arising in empirical research will also be discussed. The course is based on actual recent papers. Students are expected to complete assignments and to participate actively in classroom discussions.

Requirements and grading

Final Exam 40%, Assignments 20%, Research idea (one-pager) 20%, Class Participation 20%.

Course outline and readings

Background readings (optional)
Angrist J.D. and J.S. Pischke (2008) “Mostly Harmless Econometrics: An Empiricist Companion” Princeton University Press

Angrist J.D. and J.S. Pischke (2010) "The Credibility Revolution in Empirical Economics: How Better Research Design Is Taking the Con out of Econometrics." *Journal of Economic Perspectives*, 24(2): 3–30

Introduction and logistics

Finding data

The identification revolution

LaLonde, R. J. (1986). Evaluating the econometric evaluations of training programs with experimental data. *American Economic Review*, 604-620

Angrist, J. D. (1990). Lifetime earnings and the Vietnam era draft lottery: evidence from social security administrative records*. American Economic Review*, 313-336.

- Part A: The core tool set

Differences in Differences

Card, D., & Krueger, A. B. (1994) “Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania”. *American Economic Review*, 84(4).

Friedberg, L. (1998). Did Unilateral Divorce Raise Divorce Rates? Evidence from Panel Data. *American Economic Review*, 88(3), 608-627.

Agrawal A, Goldfarb A (2008) “Restructuring Research: Communication Costs and the Democratization of University Innovation” *American Economic Review* 98(4):1578–1590.

Matching

Azoulay P, Manso G, Graff Zivin J (2011) “Incentives and Creativity: Evidence from the Academic Life Sciences” RAND Journal of Economics 42(3):527-554.

Azoulay P, Graff Zivin J and Wang J (2010) “Superstar Extinction”. *Quarterly Journal of Economics* 125(2):549-589.

Azoulay P, Graff Zivin J, Sampat B (2011) “The Diffusion of Scientific Knowledge Across Time and Space: Evidence from Professional Transitions for the Superstars of Medicine” NBER Working Paper No.16683.

Instruments

Ginsburgh V and Van Ours J (2003) “Expert opinion and compensation: evidence from a musical competition” *American Economic Review* 93(1):289-298.

Waldinger F (2010) “Quality Matters: The Expulsion of Professors and the Consequences for PhD Students Outcomes in Nazi Germany” *Journal of Political Economy* 118(4):787-837.

Waldinger F (2012) “Peer Effects in Science - Evidence from the Dismissal of Scientists in Nazi Germany” *Review of Economic Studies* 79(2):838-861.

Regression Discontinuity

Lee, D. (2008). “Randomized experiments from non-random selection in US House elections”. *Journal of Econometrics*, 142(2), 675-697.

Luca, M (2011) "Reviews, Reputation, and Revenue: The Case of Yelp.com." Harvard Business School Working Paper, No. 12-016.

Black S (1999) “Do Better Schools Matter? Parental Valuation of Elementary Education,” *Quarterly Journal of Economics*, 114 (2), 577–599.

Ganguli I (2013) “Saving Soviet Science: The Impact of Grants When Government R&D Funding Disappears” forthcoming, *American Economic Journal: Applied Economics.*

Addressing threats to identification

Marx M, Singh J, Fleming L (2011) “Regional Disadvantage? Does Non-compete Enforcement Create a Brain Drain?” mimeo, MIT Sloan School of Management.

Agarwal R, Kolev J (2012) “Strategic Corporate Layoffs” mimeo, Harvard University.

Event studies

Malmendier, U., & Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics*, 89(1), 20-43.

Presenting interesting data

DellaVigna, S., & Malmendier, U. (2006). Paying not to go to the gym. *The American Economic Review*, 694-719.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). The regulation of entry. *The Quarterly Journal of Economics*, *117*(1), 1-37.

- Part B: Applications and extensions

Peer effects and social networks

Sacerdote B (2001) "Peer Effects with Random Assignment: Results for Dartmouth Roommates" *Quarterly Journal of Economics* 116(2): 681-704.

Zinovyeva N, Bagues M (2012) "It's Not What You Know, but Who You Know? the Role of Connections in Academic Promotions" mimeo, Universidad Carlos III de Madrid.

Munshi K (2003) "Networks in the Modern Economy: Mexican Migrants in the U.S. Labor Market" *Quarterly Journal of Economics.*

Reduced-form methods in Macroeconomics and trade

Giavazzi, F., & Tabellini, G. (2005). Economic and political liberalizations. *Journal of Monetary Economics*, 52(7), 1297-1330.

Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review.*

Miguel E, Satyanath S, Sergenti S (2004) "Economic Shocks and Civil Conflict: An Instrumental Variables Approach" *Journal of Political Economy*, 2004, 112(4), 725-753.

Feyrer, J. (2009). "Distance, trade, and income–The 1967 to 1975 closing of the Suez Canal as a natural experiment" (WP No 15557). National Bureau of Economic Research.

Kinks in the payoff functions

Duggan, M., & Levitt, S. D. (2002). Winning Isn't Everything: Corruption in Sumo Wrestling. The *American Economic Review*, 92(5), 1594-1605.

Oyer, P. (1998). Fiscal year ends and nonlinear incentive contracts: The effect on business seasonality. *Quarterly Journal of Economics*, 113(1), 149-185.

Advanced Regression Discontinuity and differences in differences topics

Briggs, D (2013) "Expanded dependent health insurance coverage and the labor supply of young adults: Outcomes from state policies and the Affordable Care Act", mimeo, University of Arizona.

Dell, M. (2010). “The persistent effects of Peru's mining Mita” *Econometrica*,78(6), 1863-1903.

Fujiwara T (2011) “Voting Technology, Political Responsiveness, and Infant Health: Evidence from Brazil”. Mimeo, Princeton University.

Reduced-forms methods in the economics of education

Garibaldi P, Giavazzi F, Ichino A, Rettore E (2012) "College Cost and Time to Complete a Degree: Evidence from Tuition Discontinuities" *Review of Economics and Statistics* 94(3): 699-711

Pop-Eleches, C., & Urquiola, M. (2013). “Going to a Better School: Effects and Behavioral Responses” *American Economic Review*, *103*(4), 1289-1324.

Cellini, S. R., Ferreira, F., & Rothstein, J. (2010). ”The value of school facility investments: Evidence from a dynamic regression discontinuity design”. *Quarterly Journal of Economics*, 125(1), 215-261.

Reduced-forms in the economics of immigration

Clemens M (2013) "Why Do Programmers Earn More in Houston Than Hyderabad? Evidence from Randomized Processing of US Visas." *American Economic Review*, 103(3): 198-202.

Yang D (2008) “International Migration, Remittances and Household Investment: Evidence from Philippine Migrants' Exchange Rate Shocks” *Economic Journal* 118(528):591-630.

Clemens, M., & Tiongson, E. (2012). Split Decisions: Family finance when a policy discontinuity allocates overseas work. World Bank Policy Research Working Paper, (6287).

Reduced-forms in development economics

Chattopadhyay, R., & Duflo, E. (2004). Women as policy makers: Evidence from a randomized policy experiment in India. *Econometrica*, 72(5), 1409-1443.

La Ferrara, E., Chong, A., & Duryea, S. Soap Operas and Fertility: Evidence from Brazil. *American Economic Journal: Applied Economics* 4(4):1-31

ENERGY ECONOMICS

Lecturer:

1st part

Sherzod Tashpulatov

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Teaching assistant:

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Office hours:

after appointment (use e-mail)

2nd part

Silvester van Koten

(slvstr@gmail.com); office 322, phone 227, mobile +420 776 125 053)

Teaching Assistant:

Vahan Sargsyan

(Vahan.Sargsyan@cerge-ei.cz)

Office hours:

TBA

Course objectives

The Energy Economics course consists of two parts. Part 1 is taught by S. Tashpulatov and Part 2 of this course is taught by Silvester van Koten. The course does not require prior knowledge related to energy.

Part 1 starts with topics on energy data and demand. Then we study the structure and functioning of different kinds of energy markets. In particular, we analyze markets and economics of fossil fuels, renewable energy sources, and electricity. The focus will also be given on quantitative analysis of different energy markets.

Part 2 focuses on topics on the electricity economics, climate change and climate policy, and the economics of oil and gas and renewables.

Course outline – 1st part

- Global energy outlook
- Energy data and balance
- Energy demand
- Coal markets
- Oil markets
- Natural gas markets
- Hotelling's economics of exhaustible resources
- Renewable energy sources
- Electricity markets

Course outline – 2nd part

- Overview of electricity, generation, transmission and electricity markets
- Climate change and the optimal economic instruments to address it
- Analysis of the effect of subsidized intermittent renewables: value, costs and interaction effects
- Clearing of Generation & Transmission markets
- Overview of fossil fuels: Oil, Gas & Coal and the path of optimal extraction
- Past and future of climate policy and energy

Grading

Grades will be based on student's performance in midterm exam, presentation, and homeworks:

Presentation for 1st part	15%
Homeworks for 1st part	10%
Homeworks for 2nd part	10%
Midterm exam	25%
Final exam	40%

For the first part, each student is asked to prepare a paper on an energy market (the chosen topics cannot coincide!). In addition to the description, the paper should also include economic research questions. For the paper there should be presentation slides which will be presented and discussed during ex-sessions. This assignment may serve as a start for the student's future dissertation topic.

Readings – 1st part

Required readings

Bhattacharyya, Subhes C. 2011. *Energy Economics: Concepts, Issues, Markets and Governance*. Springer. (Bhattacharyya).

Dahl, Carol A. 2004*. International Energy Markets: Understanding Pricing, Policies and Profits*. PennWell. (Dahl).

Serletis A. 2007. *Quantitative and Empirical Analyses of Energy Markets*. World Scientific Series on Energy and Resource Economics (Serletis).

Supplemental readings

Bosselman, F., J. Rossi, and J.L. Weaver. 2000. *Energy, Economics and the Environment: Cases and Materials.* Foundation Press. (BRW).

Kirschen, D., and G. Strbac. 2004. *Fundamentals of Power System Economics*. John Wiley & Son. (KS).

Carlton D.W., J.M. Perloff. 2000. *Modern Industrial Organization*. (3rd Ed.) World Student Series. (CP).

Tashpulatov S. 2014. *Network Industry Liberalization: The Case of the England and Wales Electricity Market*. Dissertation. Accessible at http://www.cerge-ei.cz/dissertations/tashpulatov-sherzod (Tashpulatov).

Additional references for lectures and ex-sessions

Borenstein, S. 2002. The Trouble with Electricity Markets: Understanding California's Restructuring Disaster. *Journal of Economic Perspectives* 16(1): 191-211. http://dev.wcfia.harvard.edu/sites/default/files/Borenstein2002.pdf.

Doane, M.M., and D.F. Spulber. 1994. Open Access and the Evaluation of the U.S. Spot Market for Natural Gas. *Journal of Law and Economics* 37(2): 477-517. http://www.jstor.org/stable/725740.

DUKES, 2014. Department of Energy & Climate change. *Digest of United Kingdom Energy Statistics 2014* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/338768/DUKES_2014_internet_content.pdf.

EIA (U.S. Energy Information Administration). 1999. Petroleum: An Energy Profile.
ftp://ftp.eia.doe.gov/pub/oil_gas/petroleum/analysis_publications/petroleum_profile_1999/profile99v8.pdf

Hamilton, J. 2009. Understanding Crude Oil Price. *Energy Journal* 30(2): 179-206. https://relooney.fatcow.com/SI_Routledge-Oil/Oil-Prices_2.pdf.

Heal, G. 2010. The Economics of Renewable Energy in the United States. *Review of Environmental Economics and Policy* 4(1): 139-154 http://reep.oxfordjournals.org/content/4/1/139.abstract.

Hughes, J., C.R. Knittel, and D. Sperling. 2008. Evidence of a Shift in the Short-run Price Elasticity of Gasoline Demand. *Energy Journal* 29(1): 93-114. http://web.mit.edu/knittel/www/papers/gas_demand_final.pdf.

Livernois, J. 2009. On the Empirical Significance of the Hotelling Rule. *Review of Environmental Economics and Policy* 3(1): 22-41. http://reep.oxfordjournals.org/content/3/1/22.short.

Sykes, A. 1993. An Introduction to Regression Analysis. Chicago Working Paper in Law and Economics No. 20. http://www.law.uchicago.edu/files/files/20.Sykes_.Regression.pdf.

Readings – 2nd part

All literature is available in the library or will be provided.
(The literature in italics is not obligatory, but given as reference literature)

A. Electricity markets

Edwards — Edwards, D. 2010. Energy trading & investing: trading, risk management, and structuring deals in the energy Markets. New York: McGraw-Hill.

Joskow 2008 — Joskow, P.L. 2008. Capacity payments in imperfect electricity markets: Need and design. Utilities Policy.

MIT — The future of the electric grid. (p.243-245).

Shively-E — Shively, B., Ferrare, J. Understanding today's electricity business. Enerdynamics Corp.

Stoft — Stoft, S. 2002. Power system economics: designing markets for electricity. IEEE Press: Wiley.

Joskow 2007 Joskow, P., Tirole, J. 2007. Reliability and competitive electricity markets. RAND Journal of Economics 38(1), pp. 60–84.

Reader Reader with a selection of articles (news articles and research reports) on renewables, cap-and-trade, UNCOP & climate change negotiations, and energy density considerations.

B. Climate Change

Cramton Cramton, P., Stoft, S. 2010. Price is a better climate commitment. The Economists' Voice.

Fisher Fisher, A.C. 2008 (1981). Resource and Environmental Economics. Chapter 6, p.164-174.

Hanley Hanley, N.H., Shogren, J.F., White, B. 2007. Environmental economics in theory and practice. 2nd expected demand. Chapter 5.5.

Wiesmeth Wiesmeth, H. 2012. Environmental Economic. Theory and Policy in Equilibrium. Springer: New York. Chapter 5 & 6.

Hanley Hanley, N.H., Shogren, J.F., White, B. 2007. Environmental economics in theory and practice. 2nd expected demand. Chapter 5.

Mas-Colell Mas-Colell, A. Whinston, M.D. Green, J.1995. Microeconomic Theory. Chap 11A, 11B, 11C.

Sinn Sinn. H-W. 2012. The green paradox. The MIT Press.

Smil 2013 Smil. V. 2013. Reducing the carbon and sulfur load of the atmosphere. Gaia 22(4), 255-262.

Stoft, 2008 Stoft, S. 2008. Carbonomics: How to Fix the Climate and Charge It to OPEC. Diamond Press: Nantucket. www.stoft.com.

Stoft, 2009 Stoft, S., Crampton, P., 2009. Global Carbon Pricing: A better climate commitment. Global Energy Policy Center. Research Paper 90-06.

Van Koten 2014 Van Koten, S. 2014. Do Emission Trading Schemes Facilitate Efficient Abatement Investments? An Experimental Study. CERGE-EI Working Paper 503.

C. Intermittent renewables: value, costs and interaction effects

Boehringen Böhringer, C., Rosendahl, K,E, 2009. Green serves the dirtiest. Discussion Papers No. 581, April 2009 Statistics Norway, Research Department.

Marcantonini Marcantonini, C., Ellerman, D. 2014. The Implicit Carbon Price of Renewable Energy Incentives in Germany. EUI Working Paper RSCAS 2014/28.

Hirth Hirth, L. 2013. The optimal share of variable renewables. How the variability of wind and solar power affects their welfare-optimizing deployment. FEEM Working Paper 90.2013.

Joskow 2011 Joskow, P.L. 2011. Comparing the costs of intermittent and dispatchable electricity generating technologies. American Economic Review: Papers & Proceedings 2011, 100:3, 238–241.

Perino Perino, G. 2013. Private provision of public goofs in a second-best world: Cap-and-trade schemes limit green consumerism. CBESS Discussion Paper 13-01.

Smil 2014 Smil, V. 2014. The long slow rise of solar and wind. Scientific American 282 (1):52-57. **PDF**

Taylor Taylor, G., Tanton, T. 2012. The hidden cost of wind electricity. American tradition institute. http://www.atinstitute.org/wp-content/uploads/2012/12/Hidden-Cost.pdf.

Boehringen Böhringer, C., Rosendahl, K,E, 2010. Green promotes the dirtiest: on the interaction between black and green quotas in energy markets. Journal of Regulatory Economics 37, 316–325.

Clémence Clémence, C, Nicolai, J., Pouyet, J. 2011. The role of abatement technologies for allocating free allowances, DICE Discussion Papers 34.

Cloete Cloete. 2014. Summary of Hirth's "The Optimal Share of Intermittent Renewables. The Energy collective blog.

Nicolosi Nicolosi, M. 2010. Wind power integration, negative prices and power system flexibility - an empirical analysis of extreme events in Germany. EWI Working Paper, No. 10/01.

Seade Seade, J. 1985. Profitable cost increases and the shifting of taxation. University of Warwick Economic Research Paper.

VandenBergh Van den Bergh, K.m Delarue, E., D'haeseleer,W. 2012. Impact of renewables deployment on the CO2 price and the CO2 emissions in the European electricity Sector. EUI Working Paper RSCAS 2012/66.

D. Clearing of Generation & Transmission markets

Kirschen Kirschen, D., Strbac, G. 2004. Fundamentals of power system economics. John Wiley & Sons Ltd: Chichester.

NVE NVE, 2010. The introduction to a Day-Ahead market - market design, monitoring and surveillance.

Van Koten 2008 Van Koten, S. and Ortmann, A., The unbundling regime for electricity utilities in the EU: A case of legislative and regulatory capture? Energy Economics 30(6), 3128-3140.

Van Koten 2011 Van Koten, S., Merchant interconnector projects by generators in the EU: effects on profitability and allocation of capacity. Energy Policy 41, 748–758.

Van Koten 2012 Van Koten, S., Legal unbundling and auctions in vertically integrated (utility) markets. The European Journal of Law and Economics.

Van Koten 2013 Van Koten, S. and Ortmann, A., Structural versus Behavioral Remedies in the Deregulation of Electricity Markets: An Experimental Investigation Guided by Theory and Policy Concerns. European Economic Review.

E. Fossil fuels: Oil, Gas & Coal

BP 2013 BP, 2013. Enhanced production. BP Magazine 4, p.31-35.

Chiang Chiang, A. 2005. Fundamental Methods of Mathematical Economics. 4th edition. Chapter 20.

Fisher Fisher. 2008 (1981). Resource and Environmental Economics. Chapter 2 (p.10-23).

Heal — Heal, G.M. The Optimal Use of Exhaustible Resources. In The Handbook of Natural resource and Energy Economics, Volume 3. Kneese, A.V. and Sweeney, J.B. (eds).

Shively GAS — Shively, B., Ferrare, J. 2011. Understanding today's natural gas business. Enerdynamics, Laporte.

Smil 2010 — Smil. V. 2010. Power Density Primer. From http://www.vaclavsmil.com/wp-content/uploads/docs/smil-article-power-density-primer.pdf.

Smil 2013 — Smil, V. 2013 Memories of Peak-Oil. The American Magazine.

BP — BP's Energy Outlook 2030.

Chiang — Chiang, A.C. 2000. Elements of dynamic optimization New York, NY [US] : McGraw-Hill.

Dasgupta — Dasgupta, P., Heal, G. 1974 The optimal depletion of exhaustible resources. The Review of Economic Studies 41, 3-28.

Hanley — Hanley, N.H., Shogren, J.F., White, B. 2007. Environmental economics in theory and practice. 2nd expected demand. Chap 7.

Ratner — Ratner ,M., Belkin, P., Nichol, L. Woehrel, S. 2013. Europe's Energy Security: Options and Challenges to Natural Gas Supply Diversification. Congressional Research Service 7-5700.

Stern — Stern, J. 2014. International gas pricing in Europe and Asia: A crisis of fundamentals. Energy Policy 64 (2014) 43–48.

Tietenberg — Tietenberg, T. & Lewis, L. 2012. Environmental & natural resource economics.

Vinogradov — Vinogradov. 1999. A Cook-Book of Mathematics. CERGE-EI. (p.85-92)

F. Past and future

Morris — Morris, E. 2007. From horse power to horsepower. Access 30.

Wilson — Wilson, R. 2013. The future of energy: why power density matters. The Energy Collective: http://theenergycollective.com/robertwilson190/257481/why-power-density-matters.

Sinn 2008 — Sinn. H-W. 2008. Public policies against global warming: a supply side approach. International Tax and Public Finance 15, p.360–394.

MacKay — MacKay, D.J.C. 2009. Sustainable energy – without the hot air.

Sinn 2012 — Sinn. H-W. 2012. The green paradox. The MIT Press.

Smil 2010 — Smil. V. 2010. Power Density Primer. From http://www.vaclavsmil.com/wp-content/uploads/docs/smil-article-power-density-primer.pdf

Detailed schedule

Part 1

Lectures	**Readings**
Global Energy Outlook	Bhattacharyya Ch. 1, IEA, EIA; DUKES (2014)
Energy Data and Balance	Bhattacharyya Ch. 2
Energy Demand	Bhattacharyya Ch. 3, 4
Coal markets	Bhattacharyya Ch. 16; Dahl Ch. 3; BRW Ch. 5
Oil markets	Bhattacharyya Ch. 14; BRW Ch. 6, 16; EIA (1999); Hamilton (2009)
Natural gas markets	Bhattacharyya Ch. 15; Dahl Ch. 7, 10, 11; Doane (1994); Hughes (2008)
Hotelling's Economics of exhaustible resources	Bhattacharyya Ch. 9; Livernois (2009)
Renewable Energy Sources	Bhattacharyya Ch. 11;BRW Ch. 11; Heal (2010)
Electricity markets	Bhattacharyya Ch. 10;BRW Ch. 13; KS Ch. 1, 3-4; Borenstein (2002)

During ex-sessions in addition to material discussed during lectures we will cover the following topics:

- Market structure: perfect competition, monopoly, cartel, dominant firm with competitive fringe (CP)
- Introduction to multivariate regression analysis. Sykes (1993)
- Imports, exports, and prices in Alberta's deregulated power market (Serletis Ch. 10)
- Cointegration analysis of power prices in the Western North American markets (Serletis Ch. 11)
- Case study: England and Wales electricity market (Tashpulatov)

Part 2

Week			
		A. Electricity markets	**Obligatory literature**
7	a	Fundamentals of electricity: The system	- Shively-E Ch.1, 2, 4, 5, 6, 7. - MIT (p. 243-245)
	b	Fundamentals of electricity: Generation	- Edwards p.93-112 +117 (California)
8	a	Energy-only markets: optimal generation investments, screen curves, load duration curve, Missing money & capacity payments and subsidies.	- Stoft p.33-45, 123-129 - Joskow 2007 - Joskow 2008
	b	Generation: Trading simulation 1 (COMPUTER LAB) (1 lecture + *exercise session 1*)	
		B. Climate Change	
9	a	Climate Change: optimal instruments (Pigovian taxes and Emission Trading Systems)	- Fisher Ch.6 (p.164-174) - Wiesmeth Ch.5.1, 5.2 & 6
	b	2nd best instruments (subsidies) *Exercise session 2 on Optimal generation investment & Optimal instruments for climate change*	- Wiesmeth Ch.5.1, 5.2 & 6 - Hanley Ch.5.5 - Cramton
		C. Intermittent renewables: value, costs and interaction effects	

10	a	Revisiting Renewable Energy Sources: the effect of intermittency - Costs and externalities (**exercise session on optimal investment, missing money and interaction of policy instruments**)	- Boehringen - Hirth - Joskow 2011 - Marcantonini - Taylor - Smil 2014
	b	- Interaction of policy instruments *Exercise session 3: Generation: Trading simulation 2 (COMPUTER LAB**)***	- Perino - Stoft (p.6-59)
		D. Clearing of Generation & Transmission markets	
11	a	Nodal & zonal pricing, market coupling, market splitting. Explicit and implicit auctions. Day-ahead market, Intraday market and Balancing markets	
		E. Oil, Gas & Coal	
	b	Fundamentals of Oil, Gas & Coal *Exercise session 4 on optimal control theory*	- BP 2013 (p.31-35) - Edwards (p.68-92, 126-157) - Smil 2013 - Smil 2010 - Shively-GAS, Chap 1, 2, 10
12	a	Revisiting Hotelling's Economics of exhaustible resources using optimal control theory	- Fischer, Ch.2 (p. 10-23) - Tietenberg, Ch.5 - Heal Ch.18.1 (p.855-861), 18.6 - Chiang Ch.20
	b	Revisiting Hotelling's Economics of exhaustible resources using optimal control theory: extensions and relevance for the green paradox *Exercise session 5*	- Heal Ch.18.1 (p.855-861), 18.6 - Chiang Ch.20 - Sinn 2008
		F. Past and future	
	a	Disasters, myths and miracles	- Morris - Wilson

MACRO TOPICS I / Part I

Lecturer:

Sergey Slobodyan

(Sergey.Slobodyan@cerge-ei.cz; office 330, phone 211)

Teaching assistant:

Office hours:

TBA

Course information

This part of the course will introduce a basic New Keynesian model, extend the basic model to account for unemployment and see how this model explains recoveries after recessions, introduce the problem of optimal monetary policy in the basic NK framework, and teach you to simulate and estimate DSGE models using DYNARE. If time permits, we will discuss adaptive learning in estimated DSGE models and desirability of inflation targeting.

Requirements and grading

The grading will be 50% final exam, 30% class project, and 20% homeworks.

Course outline

I. New Keynesian Framework for Studying Monetary Policy – Models with Nominal Rigidities

Gali, Ch. 3-6.

McCandles, Ch. 10.

Woodford, Ch. 3.

Walsh, Ch. 1-3.

Lim and McNelis, Ch. 3.

Calvo, G. A. (1983). "Staggered Prices in a Utility-Maximizing Framework." *Journal of Monetary Economics,* 12, 983-998.

Taylor, J. B., "Staggered Price and Wage Setting in Macroeconomics," in *Handbook of Macroeconomics*.

Blanchard, O., and J. Gali (2010). "Labor Markets and Monetary Policy: A New Keynesian Model with Unemployment", *American Economic Journal: Macroeconomics,* 2, 1-30.

Gali, J., Smets, F., and R. Wouters (2012). "Slow Recoveries: A Structural Interpretation"**,** *Journal of Money, Credit and Banking*, 44 (2), 9-30.

II. Optimal Monetary Policy in NK Framework

Gali, Ch. 4-5.

Walsh, Ch. 11.

Woodford Ch. 6, 7.

Erceg, C. J., D. W. Henderson, and A. T. Levin (2000). “Optimal Monetary Policy with Staggered Wage and Price Contracts.” *Journal of Monetary Economics*, 46, 281-313.

Woodford, M. (1999). “Optimal Monetary Policy Inertia.” *NBER WP 7261.*

Woodford, M. (2001). "The Taylor Rule and Optimal Monetary Policy." *American Economic Review*, 91, 232-237.

Woodford, M. and M. Giannoni, (2001). "Optimal Interest-Rate Rules: I. General Theory.” *NBER WP 9419.*

Woodford, M., and M. Giannoni, (2001). "Optimal Interest-Rate Rules: II. Applications.” *NBER WP 9420.*

III. Solving, Estimating, and Simulating DSGE Models with DYNARE.

http://www.cepremap.cnrs.fr/dynare/

IV. Adaptive Learning in Macroeconomics. Estimation under Adaptive Learning.

Evans and Honkapohja (1999).

Evans and Honkapohja (2001), Ch. 7, 14.

Slobodyan, S. and R. Wouters, (2012a). “Learning in an estimated medium-scale DSGE model,” *Journal of Economic Dynamics and Control*, **36**(1), 26-46.

Slobodyan, S. and R. Wouters, (2012b). “Learning in a Medium-Scale DSGE Model with Expectations Based on Small Forecasting Models,” *American Economic Journal: Macroeconomics*, **4**(2), 65-101.

V. (Optional) Inflation (Forecast) Targeting Framework.

Bernanke et al (1998), Ch. 2-3, 5, 11.Bernake and Woodford, Ch. 2, 3, 6.

Readings

Acemoglu, D., Johnson, S., and Robinson, J. (2005), "Institutions as a Fundamental Cause of Long-Run Growth," Chapter 6, *Handbook of Economic Growth*, edited by Aghion, F. and Durlauf, S., Elsevier.

Doepke, M. (2005), "Child Mortality and Fertility Decline: Does the Barro-Becker Model Filt the Facts?," *Journal of Population Economics* 18: 337-366.

Moav, O. (2005), "Cheap Children and the Persistence of Poverty," *The Economic Journal* 115: 88-110.

Bartelsman, E., Haltiwanger, J., and Scarpetta, S. (2013), "Cross-Country Differences in Productivity: TheRole of Allocation and Selection," *American Economic Review* 103: 305-334.

Buera, F. and Shin, Y. (2013), "Financial Frictions and the Persistence of History: A Quantitative Exploration," *Journal of Political Economy* 121: 221-272.

Acemoglu, D., Akcigit, U., Bloom, N., and Kerr, W. (2013), "Innovation, Reallocation, and Grwoth," National Bureau of Economic Research Working Paper 18993.

Reading

Bernanke, Ben S., T. Laubach, F. S. Mishkin, and A. S. Posen (1999). *Inflation Targeting.* Princeton University Press.

Bernanke, Ben S., and M. Woodford, *eds*. (2005). *The Inflation-Targeting Debate*. The University of Chicago Press.

Gali, J. (2008). *Monetary Policy, Inflation, and the Business Cycle. An Introduction to the New Keynesian Framework.* Princeton University Press.

Lim, G. C. and Paul D. McNelis (2008) *Computational Macroeconomics for the Open Economy.* MIT Press.

McCandles, George (2008). *The ABCs of RBCs: An Introduction to Dynamic Macroeconomic Models.* Cambridge: Harvard University Press, 2008.

Optional texts

Walsh, Carl. E. (2003) *Monetary Theory and Policy.* MIT Press.

Woodford, Michael. (2003) *Interest and Prices.* Princeton University Press.

Adaptive Learning texts

Evans, G.W. and S. Honkapohja (1999). Learning dynamics, in *Handbook of Macroeconomics*, ch.7.

Evans, G.W. and S. Honkapohja (2001). *Learning and expectations in macroeconomics.* Princeton University Press.

MACRO TOPICS I / Part II

Lecturer:

Byeongju Jeong

(Byeongju.Jeong@cerge-ei.cz; office 321, phone 233)

Teaching assistant:

Office hours:

TBA

Course information

We will study some macro topics. Listed below are the main references in the order of discussion. You are strongly adivised to read the papers/chapters in advance of lectures since the lectures will build on the basic understanding of the papers/chapters.

Requirements and grading

The grade is based on the final exam (two thirds) and occasional home problems (one third).

Readings

Brunnermeier, M. and Sannikov, Y. (2014), "A Macroeconomic Model with a Financial Sector," *American Economic Review* 104: 379-421.

Gorton, G. and Ordonez, G. (2014), "Collateral Crises," *American Economic Review* 104: 343-378.
Eggertsson, G. and Krugman, P. (2012), "Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach," *Quarterly Journal of Economics* 127: 1469-1513.

Caballero, R., Farhi, E., and Gourinchas, P. (2008), "An Equilibrium Model of "Global Imbalances" and Low Interest Rates," *American Economic Review* 98: 358-393.

Nunn, N. and Trefler, D. (2010), "The Structure of Tariffs and Long-Term Growth," *American Economic Journal: Macroeconomics* 2: 158-194.

ACADEMIC WRITING II

Lecturer – Section 1:

Paul Whitaker

(Paul.Whitaker@cerge-ei.cz; office 319, phone 259)

Lecturer – Section 2:

Dunstan Clarke

(Dunstan.Clarke@cerge-ei.cz; office 309, phone 197)

Course coordinator:

Deborah Nováková

(Deborah.Novakova@cerge-ei.cz; office 309, phone 197)

Office hours:

TBA

Course information

The purpose of this course is to support further development of in-field, PhD level academic writing skills and to provide practice in specific types of writing required.

Building upon the work in Academic Writing 1, students will research, plan, and write a Position Paper on a topic chosen by the student. The paper should analyze the work of others and offer the students' own distinct position on the topic. The earlier assignments lead directly to the Position Paper.

Requirements and grading

0% Survey	10% Summary of a Position Paper
20% Comparative Critique	60% Position Paper
10% Analysis of Peer Draft	

Students are evaluated according to their ability to produce graduate-level written academic texts in English. 100% class and consultation attendance is mandatory, and completing all assigned tasks is a minimum requirement for passing the course.

Readings

Sources and materials will be provided. Students will also participate in choosing readings.

COMBINED SKILLS II - PhD Seminar

Lecturer:

Andrea Downing

(Andrea.Downing@cerge-ei.cz; office 317, phone 254)

Office hours:

TBA

Seminar Information

This is the final required credit course for the ASC.

The seminar is designed primarily to assist dissertation proposal workshop participants with their written research proposals and presentations in consultation with Academic Skills Center faculty. The course provides students with the opportunity to deliver a practice presentation to relevant faculty, an ASC member, and interested peers. For DPW candidates, the seminar will work towards the first official DPW draft due November 1st. Consultations will continue through November until DPW week and afterwards if necessary prior to the final submission date for the ASC credit course. Students not wishing to participate in DPW can complete the course requirements by participating in all elements of the course without final attendance at DPW.

Workshops, individual conferences, and the practice presentation schedule will be determined by ASC seminar tutor and will be announced in advance.

Evaluation

This is an Academic Skills Center graded course, which includes evaluation of the written proposal and presentation.

NOTE: Full participation in the seminar, consultations, and completion of all required tasks are the minimum requirements for passing the course.

When relevant, updates that supersede this hardcopy can be found on the internal pages of the website at: https://iweb.cerge-ei.cz/phd/prog_details/coursebook/

III. PROFESSORS TEACHING IN THE FALL SEMESTER 2013

Aleš Černý, Ph.D.

Email: cerny@martingales.info
Web: www.martingales.info

Aleš Černý is a Professor of Finance at the Cass Business School in London. He holds a degree in Mathematical Engineering from the Czech Technical University and a PhD in Economics from Warwick University. Before joining Cass in 2005 he taught at the Imperial College Business School. He is the author of the masters level textbook Mathematical Techniques in Finance: Tools for Incomplete Markets, published by Princeton University Press in 2004 and 2009. His research focuses on the finance of incomplete markets. Prof. Černý's research has appeared, among others, in Annals of Probability, ASTIN Bulletin, Economic Journal, Journal of Futures Markets, Journal of Mathematical Economics, Mathematical Finance, Review of Derivatives Research and SIAM Journal on Control and Optimization. He has given over 60 talks in Europe, Canada, Japan and U.S.

Research orientation: Mathematical finance, asset pricing, risk measures and optimal portfolio allocation, performance measurement.

Dunstan Clarke, BA

Email: Dunstan.Clarke@cerge.ei.cz

Dunston Clarke is a DELTA-qualified English teacher with 14 years' experience. Dunston is currently in the first year of a Master's in Applied Linguistics. He has been teaching academic English, writing and presentations to a doctoral level since 2004. Dunston currently works at ČVUT where he proof-reads academic texts as part of his job. He also has experience in management, teaching all the Cambridge exams, teaching business English and academic skills for MBA and BBA programmes.

Andrea Downing, Ph.D.

Email: Andrea.Downing@cerge-ei.cz

Andrea Downing is teaching at CERGE-EI since September 2012. Received her Ph.D. in Economic and Social History from the University of Liverpool, UK in 1998 and M.A. in Research Methods in the Social Sciences from the University of Liverpool, UK in 1993. She worked as a Lecturer at the Metropolitan University in Prague from 2010 to 2012. She was also working as a Teacher Trainer at the Metropolitan University in Prague from 2010 to 2011, where she designed and delivered pedagogic training to aspiring and in-service Czech teachers of English. From September 2004 to June 2005 she was an Associate Professor and a Chair of Foundation Studies at Sur University College in Oman.

Research orientation:

Multiple intelligences and learner autonomy and observing the observer in teaching development.

RNDr. Michal Franta, Ph.D.

Email: Michal.Franta@cerge-ei.cz

Michal Franta is an advisor to the bank board and research coordinator for the area of monetary policy at the Czech National Bank. He received his M.A. and Ph. D. degrees in Economics from CERGE-EI, Charles University in Prague in 2005 and 2010. He graduated from Charles University in Mathematics in 2002. He worked both in central banks (ECB, Bank of Japan) and academic institutions (La Trobe University, Melbourne).

Research orientation:

Bayesian econometrics, monetary economics

Patrick Gaulé, Ph.D.

Assistant Professor

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Webpage: http://sites.google.com/site/patrickgaule/

Patrick Gaule is an Assistant Professor at CERGE-EI (under U.S. permanent charter) and at CERGE, Charles University, and a Researcher at the Economics Institute of the Academy of Sciences of the Czech Republic since September 2012.

He received his Ph.D. from the Ecole Polytechnique Federale de Lausanne, Switzerland, in May 2009. From September 2009 to August 2012, he held a succession of postdoctoral appointments at the MIT Sloan School of Management, the National Bureau of Economic Research, and Harvard University.

Research orientation:

Applied microeconomics; economics of innovation; high-skilled migration.

Byeongju Jeong, Ph.D.

Mellon Endowment Associate Professor with Tenure

Email: Byeongju.Jeong@cerge-ei.cz

Webpage: http://home.cerge-ei.cz/bee

Byeongju Jeong is the Mellon Endowment Associate Professor with tenure at CERGE-EI (under US permanent charter) and a member of the Executive and Supervisory Committee of CERGE-EI since 2003. He is also an Assistant Professor at CERGE, Charles University and a Researcher at the Economics Institute of the Academy of Sciences of the Czech Republic (EI) since 1997. He served as the Deputy Director for Graduate Studies at CERGE and EI from 2010 to 2012. Graduated from the University of Texas with a B.A. degree in Economics in 1991. Received a M.A. in Economics from the University of Minnesota in 1994, and a Ph.D. in Economics from the University of Minnesota in 1996. Lecturer at Pennsylvania State University from 1996 to 1997.Visiting professor at Universitat Pompeu Fabra in Barcelona from 2003 to 2004.

Research orientation:

Growth and development, macro labor, international macro.

doc. Ing. Michal Kejak, M.A., CSc.

Associate Professor with Tenure

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Webpage: http://home.cerge-ei.cz/mkej/

Michal Kejak is the Associate Professor with tenure at CERGE-EI (under US permanent charter) and a member of the Executive and Supervisory Committee of CERGE-EI (since 2007). He is a Docent (Associate Professor) at CERGE, Charles University and a Senior Researcher at the Economics Institute of the Academy of Sciences of the Czech Republic (EI) since 2008. Since September 2010 he serves as the Deputy Director for Research of CERGE and EI (also during 2003-2005).

Master of Science in Technical Cybernetics, Czech Technical University, Prague, Faculty of Electrical Engineering, Department of Control, 1982. M.A. in Economics, Central European University, Prague, awarded by the State University of New York, 1993. CSc. (Ph.D.) in Technical Cybernetics, Czech Technical University in Prague, Faculty of Machine Engineering, Department of Automatic Control, 1993. Diploma, Program in Applied Economics 1993-1994, Institute for Advanced Studies, Vienna, 1994.

Researcher, Institute for Application of Computing Technique in Control, Prague, 1982-1990. Researcher, Institute for Forecasting of the Czechoslovak Academy of Sciences, Prague,1990-1993. Visiting Research Fellow, Economics Department, Institute for Advanced Studies, Vienna, 1993-1994. Visiting Scholar, Hoover Institute, Stanford University, 1995-1996. Temporary Consultant, World Bank, 1999. Visiting Faculty, PhD program, CEU Budapest, 2000-2004. Adjunct Faculty, PhD program, Cardiff Business School since 2005.

Research orientation:

Macroeconomic theory, monetary models, growth and business cycle models, heterogeneous agent models, numerical methods in macroeconomics.

Mgr. PhDr. Silvester van Koten, Ph.D.

Post-Doctoral Fellow

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https://sites.google.com/site/slvstrnl/

Silvester van Koten is a Jean-Monet Fellow at the Florence School of Regulation and a Post-Doc Fellow at CERGE-EI in Prague. He is a researcher with a special interest in the economics of energy markets, renewables, and regulation. His present research appraises the effectiveness of forward markets to alleviate market power using economics experiments. In his previous research, he analyzed the effects of incomplete unbundling on competition. Apart from his intellectual passion, Economics, Silvester van Koten has interests in a broad range of fields, such as Public Speaking, Psychology, the Philosophy of Science, and Mathematics.

Research Orientation:

energy markets, regulation, and economics experiments.

Fabio Michelucci, Ph.D.

Assistant Professor

Email: Fabio.Michelucci@cerge-ei.cz

Webpage: http://www.fabiomichelucci.com/

Fabio Michelucci is an Assistant Professor at CERGE-EI (under US permanent charter) and at CERGE, Charles University and a Researcher at the Economics Institute of the Academy of Sciences of the Czech Republic since 2009. Earned his B.A. degree in Economics, summa cum laude (2000), from the University of Florence, Italy; M.Sc. degree in Economics (2001) from the Universitat Pompeu Fabra, Spain; Ph.D. degree in Economics (2007) from University College London, United Kingdom. From 2002 until 2006 he was working as a Teaching Assistant at the University College London, United Kingdom. In 2006 he was also working as a Researcher (Assegnista di Ricerca) at Bocconi University, Italy. From 2007 to March 2009 he was a Post-doctoral Scholar at the Division of the Humanities and Social Sciences, California Institute of Technology, USA. He is a holder of Mario Landi Award, Amici di Villa Favard, University of Florence (2001-2002), and also a holder of Instituto Valenciano de Investigaciones Economica Award for the paper “Second Best Efficiency in Auctions” (2005). He obtained a Bank of Italy scholarship, Bonaldo Stringher (2001-2003), and an Ente Luigi Einaudi Scholarship (2003-2004).

Research orientation:

Economic theory, industrial organization, mechanism design, auction theory, and experimental economics.

Deborah Nováková, M.A.

Academic Skills Center

Email: Deborah.Novakova@cerge-ei.cz

Deborah Nováková is teaching at CERGE-EI beginning in August 2012. She received her M.A. in TEFL/TESL from the University of Birmingham, UK in 2007. From October 2007 to October 2010 she was working as an Instructor, course coordinator, curriculum developer and a professional development facilitator at Maastricht University Language Centre in Netherlands. She was also at Maastricht University from 2001-2003. During the years 2003 to 2007 she was working as an Instructor, curriculum developer and an editor at the Southern Alberta Institute of Technology in Calgary, Canada, where she worked on both domestic and international projects.

Research orientation:

Curriculum design, teacher training and professional development, successful intercultural communication in international contexts, student-centred learning approaches and methods, successful team-building in classroom and teaching in team contexts.

Michal Pakoš, Ph.D.

Associate Professor

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Webpage: http://home.cerge-ei.cz/pakos

Michal Pakoš is an Assistant Professor at CERGE-EI (under US permanent charter) and at CERGE, Charles University since September 2011 and a Researcher at the Economics Institute of the Academy of Sciences of the Czech Republic since August 2009. Earned his bachelor´s degree in

Management (1998) from the Comenius University, Slovakia; master´s degree in Financial Management (2000) also from the Comenius University, Slovakia; MA. degree in Economics (2000/With Distinction) from the Central European University, Hungary; Ph.D. degree in Financial Economics (2005) from the Graduate School of Business of the University of Chicago, USA. From 2005 till 2009 he was working as an Assistant Professor of Finance at the Carnegie Mellon University, USA.

Research orientation:

Empirical macroeconomics, asset pricing, especially with asymmetric information, portfolio choice, quantitive financial economics.

Prof. Avner Shaked, Ph.D.

Visiting Professor, Bonn University

Email: shaked@uni-bonn.de

Avner Shaked is a Visiting Professor at CERGE-EI since 1998. Since May 2000 member of the Executive and Supervisory Committee of CERGE-EI. State Street Distinguished Visiting Professor at CERGE-EI since Fall 2001 to Spring 2009. Earned a B.Sc. from Hebrew University, Jerusalem in Mathematics and Physics in 1964. Holds a M.Sc. (1965) from Hebrew University, Jerusalem in Mathematical Logic. In 1972 earned his Ph.D. degree in Economics from Hebrew University, Jerusalem. Since 1989 Professor of Economic Theory, Bonn University, Germany. Since February 2009 a Professor emeritus in Bonn (retired). 1982–1993 member of the Editorial Board of the Review of Economic Studies; 1982–1987 Secretary Organizer of the Workshop in Theoretical Economics, STICERD, London School of Economics; 1983–1989 London Coordinator of the European Doctoral Program; 1988–1991 Associate Editor of The Quarterly Journal of Economics; 1993–1995 Associate Editor of the Journal of Economic Theory; since 1992 a Fellow of Econometric Society.

Research orientation:

Bounded rationality, learning theory, evolutionary theory, experimental game theory, theoretical industrial organization, bargaining theory.

Sergey Slobodyan, Ph.D.

Citigroup Endowment Associate Professor with Tenure

Email: Sergey.Slobodyan@cerge-ei.cz

Sergey Slobodyan is the Citigroup Endowment Associate Professor with tenure at CERGE-EI (under US permanent charter) since 2011 and a member of the Executive and Supervisory Committee of CERGE-EI since 2009. He is also an Assistant Professor at CERGE, Charles University and a Researcher at the Economics Institute of the Academy of Sciences of the Czech Republic since 2000. Since September 2012 he serves as the Deputy Director for Graduate Studies at CERGE and EI. He has received his M.Sc. in Physics from Novosibirsk State University in 1988, later M.A. in Economics from Washington University in 1996 and Ph.D. in Economics from Washington University in 2000. He has taught economics in St. Louis, Prague, Frankfurt, Kiev, and Novosibirsk and worked at the Institute of Inorganic Chemistry, Novosibirsk.

Research orientation:

Bayesian estimation of DSGE models, especially under adaptive learning; large deviations theory in models of monetary policy; adaptive learning; interaction of public pensions and public educational systems; dynamics of growth models with multiple steady states and indeterminacy; micro-simulations of various markets, such as education and electricity, using agent-based computational economics.

Mgr. Jakub Steiner, Ph.D.

Associate Professor with Tenure

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Jakub Steiner is an Associate Professor with tenure at CERGE-EI (under US permanent charter) and a member of the Executive and Supervisory Committee of CERGE-EI (since 2012). Since September 2012 he is an Assistant Professor at CERGE, Charles University, and since January 2012 a Senior Researcher at the Economics Institute of the Academy of Sciences of the Czech Republic. He has been awarded the J. E. Purkyně Fellowship by the Academy of Sciences of the Czech Republic. He is an Assistant Professor at Kellogg, MEDS at Northwestern University since September 2009. Prior to his appointment at Kellogg, he worked as an Assistant Professor at the University of Edinburgh. He completed his Ph.D. in Economics at CERGE-EI in 2006, and M.A. in Physics at Charles University in 2000. He has published in journals such as American Economic Review, the Journal of Economic Theory, Theoretical Economics, and Games and Economic Behavior. He worked as a social worker for a Roma community from 2000-2002, and since then he has been interested in the economics of social exclusion.

Research orientation:

Game theory and economic theory. He studies behavior in strategic situations with the possibility of self-fulfilling prophecies such as those that arise during currency attacks, bank runs, and revolutions.

Sherzod Tashpulatov, PhD.

Junior Researcher

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Sherzod Tashpulatov earned his master's degree in mathematical methods in economic analysis and teaching diploma from Moscow State University, M.A. and Ph.D. degrees in Economics from CERGE-EI. Two chapters of his dissertation research on energy markets liberalization, supervised by Doc. Ing. Lubomír Lízal, Ph.D., were published in top field international journals. His research interests include energy economics, applied microeconomics, dynamic modeling and optimization, and mathematical methods in economic analysis.

Paul Whitaker, M.A.

Academic Skills Center

Email: paul.whitaker@cerge-ei.cz

Paul Whitaker has been teaching at CERGE-EI since August 2014. He earned his Master's from the University of Nottingham, England in 2000. Before coming to CERGE-EI, Paul taught at the Higher Colleges of Technology in the UAE and the School of Business Administration in Karviná, Czech

Republic. He also worked for many years as a teacher trainer and business skills trainer focusing on presentation and communication skills for multinational companies.

His research interests include effective communication, student-centered learning approaches and teacher training.

PhDr. Jan Zápal, Ph.D.

Assistant Professor

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Webpage: https://sites.google.com/site/jzapal/

Jan Zápal has been an Assistant Professor at CERGE-EI (under U.S. permanent charter) as of September 2012. He has been an Assistant Professor at CERGE, Charles University and a Researcher at the Economics Institute of the Academy of Sciences of the Czech Republic, since September 2014. Between July 2013 and August 2014, he has also worked as a Researcher at CERGE, Charles University. He received his Master´s degree from the Institute of Economic Studies at Charles University in 2005 and a Ph.D. degree from the London School of Economics and Political Science in 2012. During his Ph.D. studies he was a Visiting Student Researcher at the Californian Institute of Technology (2010 to 2011), held an Economica Scholarship awarded by the LSE Department of Economics (2007 and 2008), and won the first prize in the Young Economist of the Year competition organized by the Czech Economic Society (2008). Between 2012 and 2014 he was a Post-doctoral Fellow at IAE-CSIC, Barcelona.

Research orientation:

Political economics, economic theory, dynamic bargaining models, effect of status-quo and its determination in the context of group decision making, decision making in monetary policy committees.

doc. Krešimir Žigić, Ph.D.

Citigroup Endowment Associate Professor with Tenure

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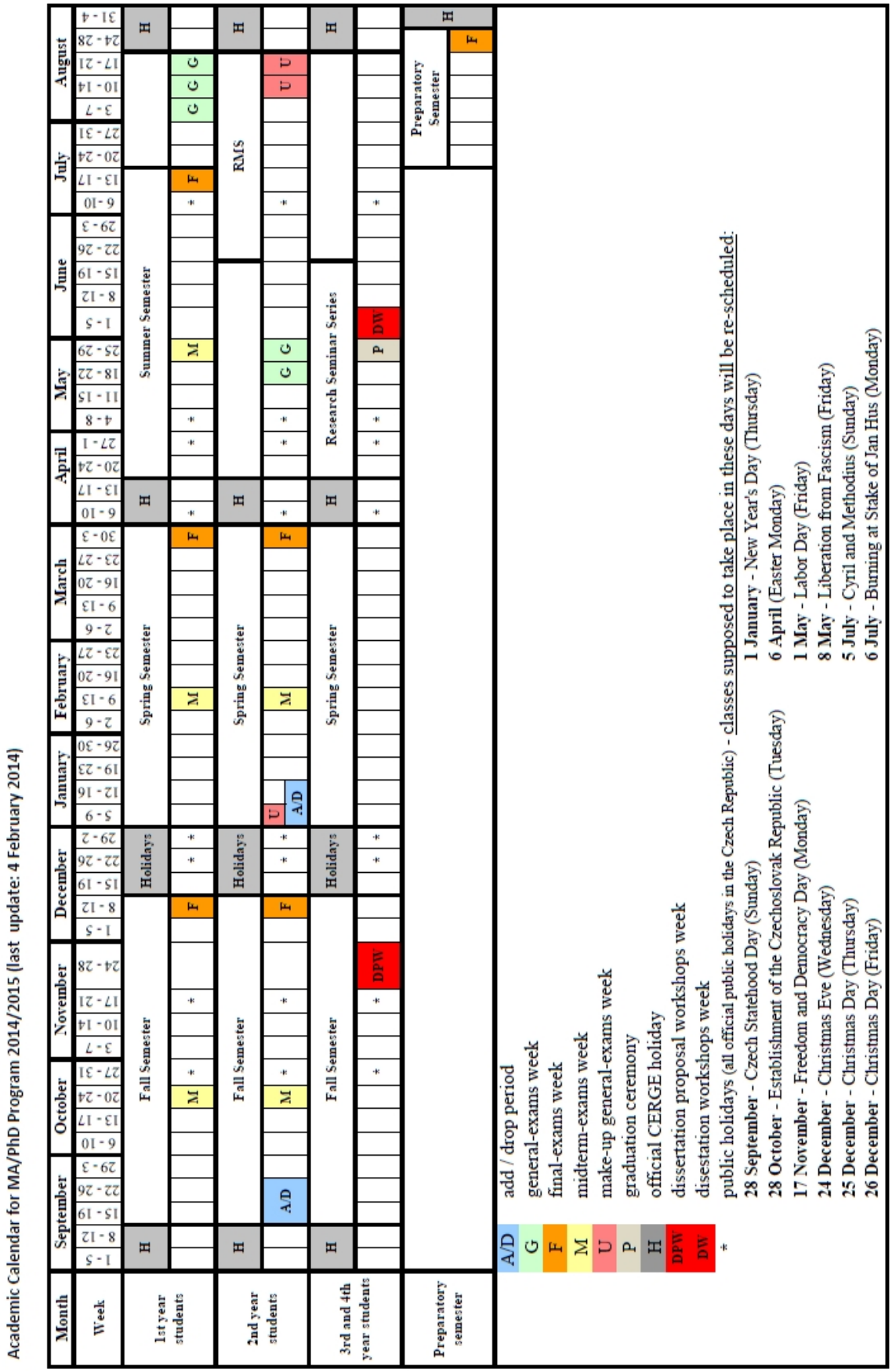
Krešimir Žigić is the Citigroup Endowment Associate Professor with tenure at CERGE-EI (under US permanent charter) since 2007 and a member of the Executive and Supervisory Committee of CERGE-EI since 2004. He is a Docent (Associate Professor) at CERGE, Charles University since 2012 and a Researcher at the Economics Institute of the Academy of Sciences since 1993. Graduated from the Faculty of Economics, University of Zagreb, B.A. 1982, M.A. 1988. Ph.D. in Economics, CERGE-EI, 1996. Assistant Professor, CERGE, Charles University, 1996–2012. Deputy Director for Graduate Studies, CERGE and EI 1997–1999 and 2005–2008. At CERGE-EI (under US permanent charter) he was Philip Morris Associate Professor, Fall 2001 – Fall 2002, Altria Associate Professor, Spring 2003, and Associate Professor of European Economic Issues, Česká spořitelna Chair, Fall 2003 – Spring 2007. Financial Officer, Rade Koncar Corporation, Zagreb, 1982–1990. Lecturer, Central European University, 1994. Lecturer, World Bank and Joint Vienna Institute Comprehensive Course, 1993–2003.

Research orientation:

International trade, industrial organization, applied microeconomics.

IV. ACADEMIC CALENDAR 2014 - 2015



V. FALL SEMESTER TEACHING SCHEDULE 2014

The schedules are subject to change. Most recent versions are at
https://iweb.cerge-ei.cz/phd/prog_details/coursebook/

A.FIRST YEAR STUDENTS

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
08:30 – 10:00		**Microeconomics** *Zápal* 320			
10:00 – 10:30	*Coffee Break*				
10:30 – 12:00	**Macroeconomics** *Slobodyan/Kejak* 320	**Microeconomics** *Zápal* 320	**Macroeconomics** *Slobodyan/Kejak* 320		
12:00 – 13:30	*Lunch Break*				
13:30 – 15:00		**Statistics** *Gaulé* 320		**Statistics** *Gaulé* 320	
15:00 – 16:30					**Research Seminars**
16:30 – 18:00	**Research Seminars**			**Research Seminars**	

B.SECOND YEAR STUDENTS - September 15th to October 26th

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
08:30 – 10:00		**Empirical Methods** *Gaulé* 3	**Energy Economics** *Tashpulatov* 3	**Financial Markets I*** *Černý*	**Financial Markets I*** *Černý*
10:00 – 10:30	*Coffee Break*				
10:30 – 12:00	**AW2** *Whitaker* 117	**AW2** *Clarke, Whitaker* *5,117*	**Empirical Methods** *Gaulé* 3	**Financial Markets I*** *Černý*, 3 **ES Energy Economics**** *Tashpulatov*, 3	**Financial Markets I*** *Černý*, 3 **ES Energy Economics**** *Tashpulatov*, 3
12:00 – 13:30	*Lunch Break*				
13:30 – 15:00		**Econometrics III** *Franta* 3	**Industrial Organization** *Shaked, Steiner* 3	**Industrial Organization** *Shaked, Steiner* *3*	**Energy Economics** *Tashpulatov* 3
15:00 – 16:30	**AW2** *Clarke* 117	**Macro Topics I** *Slobodyan* 3	**Econometrics III** *Franta* 3	**Macro Topics I** *Slobodyan* 3	**Research Seminars**
16:30 – 18:00	**Research Seminars**			**Research Seminars**	

* **Sept 18, 19, Oct 2, 3, 16, 17**

** **Sept 25, 26, Oct 9, 10, 23, 24**

B.SECOND YEAR STUDENTS - October 27th to December 12th

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
08:30 – 10:00		**Empirical Methods** *Gaulé* 3			
10:00 – 10:30	*Coffee Break*				
10:30 – 12:00	**AW2** *Clarke, Whitaker* 117	**AW2** *Clarke, Whitaker* *5,117*	**Empirical Methods** *Gaulé* 3	**Econometrics III** *Kejak, Pakoš* *3*	**Econometrics III** *Kejak, Pakoš* *3*
12:00 – 13:30	*Lunch Break*				
13:30 – 15:00	**Financial Markets I** *Michelucci* 3	**Financial Markets I** *Michelucci* 3	**Industrial Organization** *Žigić* 3	**Industrial Organization** *Žigić* 3	**Energy Economics** *van Koten* 3
15:00 – 16:30	**AW2** *Clarke* 117	**Macro Topics I** *Jeong* 3	**Energy Economics** *van Koten* 3	*Jeong* 3	**Research Seminars**
16:30 – 18:00	**Research Seminars**			**Research Seminars**	**ES Energy Economics** Sargsyan 3

Notes: