PHBS SIQEF
Sargent Institute of
Quantitative Economics and Finance

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SARGENT INSTITUTE OF QUANTITATIVE ECONOMICS AND FINANCE

NEWSLETTER

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Contents in this issue:


Institute of Quan
Establ

SIQEF

"Our institute strives to put mathematics and statistics at the service of quantitative analysis of questions about economics, finance, and government policy. Scientists use mathematics because mathematics insists that models to be coherent. We use statistics because we want our models to approximate the data as well as possible. Our purpose is to learn, teach, and apply an array of methods made possible by the availability today of inexpensive and powerful computers, sophisticated and constantly improving computational methods, and large data sets. We aspire to provide a platform for developing computational economics and finance based on user friendly and powerful open source languages, especially Python and Julia."

— *Thomas Sargent*

About Sargent Institute of Quantitative Economics and Finance

01

The Sargent Institute of Quantitative Economics and Finance (SIQEF) at Peking University HSBC Business School (PHBS) was established in June 2017. Professor Thomas Sargent, the 2011 Nobel laureate in economics, serves as its founding director. Its members consist of Professor Sargent's international research team and faculty from PHBS. On June 22, 2018, Peking University conferred Professor Sargent with an honorary professor title.

The Institute is committed to promoting innovation and development in the frontiers of quantitative economics and finance theory, providing new theoretical basis for the formulation of macroeconomic policies and financial instruments, and providing forward-looking and professional advice for sustainable economic development and macroeconomic policy making. The research of the Institute focuses on macroeconomics, international economics, quantitative finance, investment, and trade. It intends to explore the role of artificial intelligence and big data in economic and financial analysis and in forecasting applications, and to use tools from structural macroeconometrics to analyze the long-run effects of economic policies.

In November 2017, after Peking University HSBC Business School and Ping An Technology announced a comprehensive cooperation in the field of macroeconomics and financial research, Professor Sargent serves as the chief advisor to conduct research. In January 2018 and January 2019, Professor Sargent designed and organized the Winter Camp of Quantitative Economics and Finance at the PHBS. In the Winter Camp, students from all over China learned to use Python in data processing, dynamic programming, and asset pricing. In September 2018, the Ph.D. program in Quantitative Economics, designed and organized by Professor Sargent, was officially launched with the first batch of doctoral students. The Ph.D. program aims to teach students the core tools and concepts of modern economics research, and to develop talents who can innovate at the tool level and apply tools to solve practical problems.

Professor Sargent pioneered the Rational Expectations Revolution in macroeconomics. Rational expectation is an equilibrium concept that endows economic agents with the ability to know their own environment, allowing them to analyze and form expectations on macroeconomic outcomes and policies. Rational expectation has dramatically changed macroeconomic research and policy-making. Professor Sargent subsequently delved into learning theory and robustness theory to address questions beyond rational expectation. To which extent, how and at what rate do agents learn about the true nature of their environment? How do agents make economic decisions when they are smart enough to doubt their own cognitive understanding of the world? These questions remain the frontier and core of economics. Through his extensive research portfolio, Professor Sargent has

Certificate and Medal of Peking University Honorary Professor

demonstrated the implication of micro foundations on macroeconomic outcomes such as inflation and unemployment, as well as fiscal and monetary policymaking.

Being a lifetime learner and researcher, Professor Sargent continues to develop and introduce tools for economic problem solving. These days he is especially interested in learning and teaching open-source programming languages such as Python and Julia, and has applied these languages to macroeconomic and quantitative finance research.

PHBS launched a research cooperation platform with Ping An Technology


PHBS

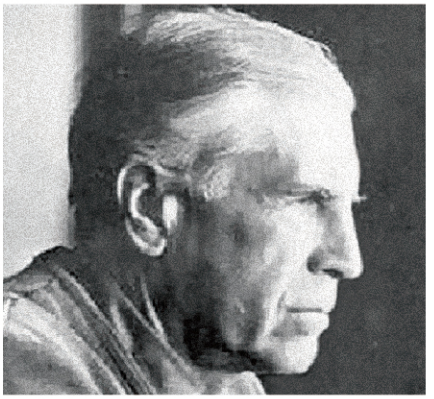
02

PHBS Holds 2019 Winter Camp:

The Beauty of Python Programming and Its Application

As the world's economy undergoes profound changes, how do we understand complex issues and seek solutions? Mathematics and statistics serve as the foundation for quantitative analysis in questions about economics, finance, and government policy. In this context, SIQEF hosted the 2019 Winter Camp of Quantitative Economics and Finance on January 21 to 29, providing rigorous training in Python programming and its applications in economics. Targeted for undergraduate students, the camp offers opportunities to probe methods for both academic application and professional practice.

Richard Bellman



Lev Pontryagin

Students at the Winter Camp learned about dynamic programming and optimal control methods, essential to modern macroeconomics. Left, photo of American mathematician Richard Bellman, the discoverer of dynamic programming. Right, Soviet mathematician Lev Pontryagin, the discoverer of modern optimal control theory. Both methods are used in everything from Economics to computer science and robotics.

2019 Opening Ceremony

This year's camp welcomes more than 30 students from key universities nationwide, including Tsinghua University, Peking University, Nankai University, Renmin University of China, and Shanghai University of Finance and Economics. Participants received an eight-day intensive training led by several instructors from New York University, PHBS and QuantEcon, a nonprofit international organization dedicated to improving economic modeling led by renowned economists.

Professor Sargent delivered remarks on the importance of Python by elaborating on how it can be used to set up economic models, stating that "I learn more economics when I learned Python." He maintained that building models that simulate time series and address major issues confronting the real world could be much more fun than playing computer games. He also pointed out that it's important for both policymakers and graduates to learn these methods to make better decisions.

Dean Hai Wen briefed participants on the aim of SIQEF and this winter camp, urging students to work hard and rise to tough challenges in the eight-day training. He said that he hoped that this camp could serve as an opportunity for students to lay a solid foundation for their future academic research and career.

In sharing feedback from the first winter camp last year, Professor Shi Jiao recommended that students enjoy the training rather than "take it as torture" by realizing that you have learned so much more about something so important and useful by the end of each day. She also introduced the PHBS doctoral program, which focuses on quantitative training and tools. "The winter camp and the tools we try to deliver are to empower you," she emphasized.

Winter Camp of Quantitative Economics and Finance

August 2019 \ ISSUE 01

2019

Intensive Training

Professor John Stachurski teaches at the Winter Camp

Dean HAI Wen speaks at the opening ceremony of the Winter Camp

SIQEF has held the annual winter camp for two consecutive years, which provided a nearly two-week intensive training in Python programming and its applications in economics. Roughly, in the first five days, students were taught ideas ranging from basic syntax and packages in Python as well as tools for various applications; in the following days, instructors taught them how to apply those tools to substantive issues including sources of inequality, exchange rate models, monetary policy, and shadow banking.

In particular, courses provided by instructors ranged from Regression and Maximum Likelihood, Bayesian Inference, Finite Markov Chains, Linear Algebra with Python and among others. Stating that "Python can do a lot of favor for economic research," Professor Sargent himself also offered courses for those students, guiding them to learn programming step by step and use Python to express ideas in an accessible way.

In addition, students conducted after-class practice in the financial lab to enhance the skills and knowledge that they learn in the class. In the lab, they could get both real-time and historical economic and financial data around the world through various data terminals. Students used tools and modeling techniques taught in the winter camp to analyze data.

Outside the classroom, students were provided chances to visit leading companies in Shenzhen, such as Ping An Technology, where they gained a better understanding about Fintech, deep learning and artificial intelligence, and how to apply models to real-life scenarios. PHBS has signed a strategic agreement with Ping An Technology to jointly establish a high-level research platform on macroeconomics and finance by combining AI technology, big data, classical economics and investment theories.

SIQEF Doctoral Program

03

PHBS launched its Ph.D. program in quantitative economics in fall 2018. The core philosophy of the program is to empower Ph.D. candidates by teaching them modern research tools in economics in a patient and solid manner. Initiated by SIQEF, this program focuses on fundamental training as well as applications of modern research tools.

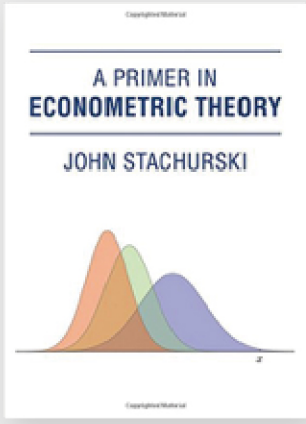
In the first three semesters, Ph.D. candidates will study math, microeconomics, macroeconomics, econometrics, and programming.

Offering challenging courses, this program aims to lay a solid foundation for ambitious elite MA and doctoral students. Students will take 40 to 60 hours per week. First-year classes will start with about 75% "tools" and 25% "applications." These ratios will gradually change so that by the end of the first year, classes will be 25% about tools and 75% about applications. Starting from the second semester of the second year, students will take field courses according to their interests. Third-year students will also take at least one field class every module.

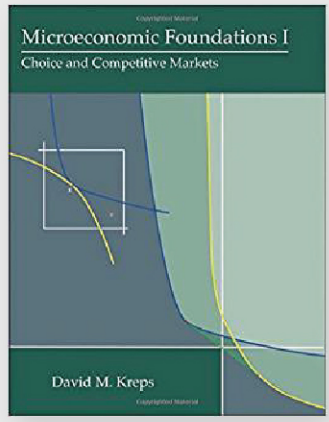
After the first semester of the second year, a written exam will be given based on the contents of the fundamental courses. Students will be considered qualified researchers upon completing the courses with satisfactory performance and passing the qualification examination. Starting from the third year, students are provided chances to attend reading groups in either microeconomic or macroeconomics, broadly defined, to acquire skills of reading and presenting papers.

As SIQEF has a set of ongoing research projects, students who are interested in the related fields can opt to work on one of these projects. This will allow students to work with one of the faculties of the SIQEF and learn to do applied research. The standard length of the program is five years, and students should take no longer than eight years to complete the program.

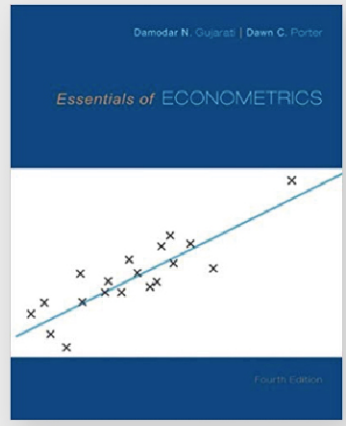
The core courses of this program are also open to full-time master students at PHBS as an honorary "Elite Master Program." Master students who are interested in pursuing an academic career in the future, as well as those who intend to employ state-of-the-art tools in future work, can benefit from the opportunity to enroll in the doctoral curriculum.



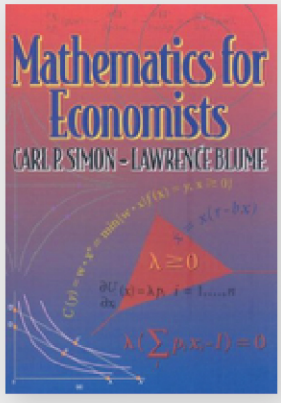
A Primer in Econometric Theory



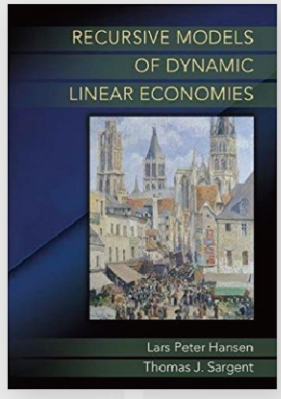
Microeconomic Foundations



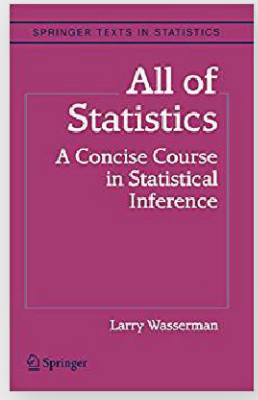
Essentials of Econometrics



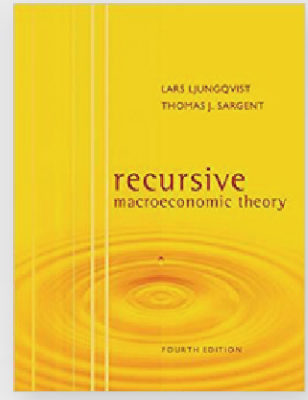
Mathematics for Economists



Recursive Models of Dynamic Linear Economies



All of Statistics

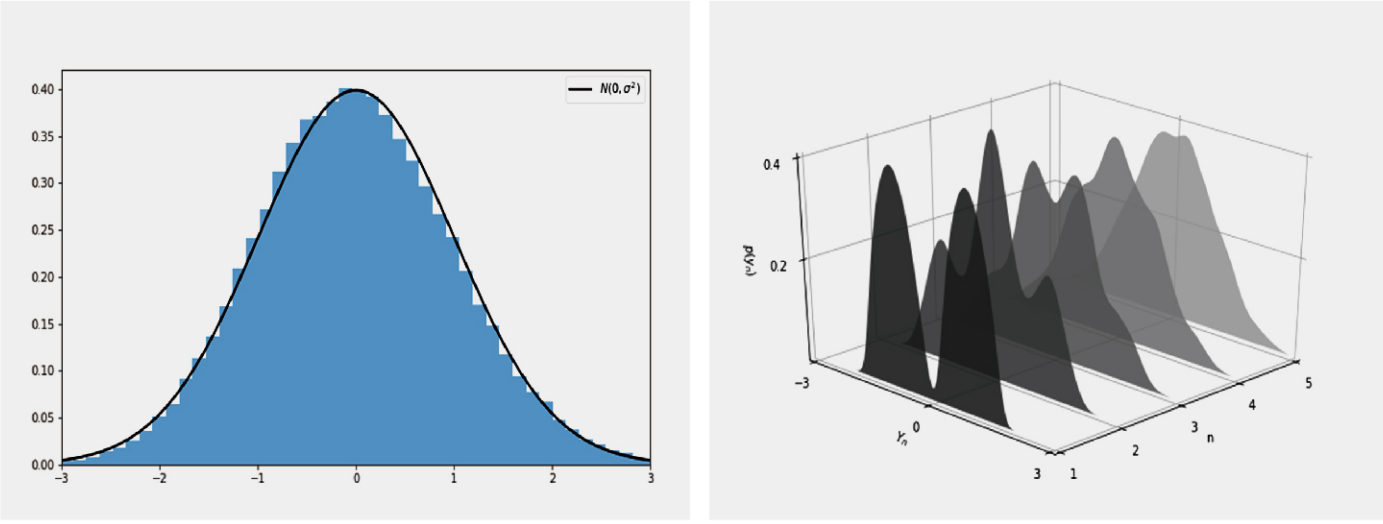


Recursive Macroeconomic Theory

Selected textbooks of the Ph.D./Elite MA program

Guide to the Perplexed about Math and Macroeconomics 04

By Thomas Sargent



Illustrations of the Central Limit Theorem by simulation (from QuantEcon)

Q. Why do working economists today reason in terms of mathematics and present their ideas with mathematics?
A. We use arithmetic because we count things. Also, a fascinating thing about economics is that our job is to describe and understand decisions of and interactions among people who also count things. Some of the things that they count and care about are either identical with or constituents of the things that we count. The people whom we study and we as economists measure prices and quantities and incomes and wealth.

Q. Why do we go beyond arithmetic and use higher mathematics like algebra, geometry, and calculus to analyze data and the people who make the decisions that created the data?
A. We use such higher mathematics because we want to reason coherently. We want to reason explicitly and put all of our cards on the table – meaning that we explicitly state both the "if" and the "then" and the steps that lead from "if" to "then." Mathematics is the most efficient and universal language in which such reasoning occurs.

Q. Is the coherence of a model that mathematics brings sufficient for the model to be a good one?
A. Definitely no. You can write down a coherent model that describes an artificial world that is purely imaginary.

Q. Then what's so great about coherence?
A. We like it because it means that arguments fit together, and we aren't assuming something in one part of a structure that contradicts something we have assumed in another part. Only with a coherent model can we get a story that sorts out "cause" and "effect."
I confess that it is an esthetic judgment to say that we like coherence - an act of faith that coherent models have a better chance of helping us understand data than incoherent ones.

Q. What tools are available for checking whether one coherent theoretical model is more realistic than another?
A. Mathematical statistics.

Q. Is that why working research economists use mathematical statistics so pervasively?
A. Yes. And also, because we want to be precise about risk and uncertainty and to state carefully about what we know and what we don't know. We don't know everything.
But just because we don't know everything, it does not follow that we know nothing. Statistics is a tool that allows us to draw lines between what we know and what we don't know.

Q. Aren't data and mathematical statistics enough by themselves? Why do we want to use economic theory too, and to combine economic theory with statistics?
A. Because the message of modern (Bayesian) statistical theory is that all you can learn from data is features or parameters of a model. If you ask the data to "speak for themselves" they will be completely silent. Statistical theory is about learning parameters of a model. And for research macroeconomists, that is a macroeconomic model with people inside it who are making decisions and also "doing their own statistical analyses."

Q. Are there examples where the methodology of mixing data and theory together in the way that you describe have actually been of practical use?
A. Yes, there are many examples. A good way to answer this question is to remember the origins of "operations research" and "information theory" in the United Kingdom and the United States and the Soviet Union during World War II. The armed forces in these countries faced a number of practical problems that can broadly be classified as "optimal resource allocation problems" (the origin of "operations research") and code breaking and code creation (the original of "information theory") that people trained in the liberal arts instead of science could not solve. Intellectual giants such as Milton Friedman, Abraham Wald, Alan Turing, Claude Shannon and others made huge contributions to the allied war effort against the Nazis and Japanese armed forces by apply-

Walter Bagehot,
editor of "The Economist" and
author of "The English Constitution" and "Lombard Street."

ing and inventing tools in optimization theory and what later came to be recognized as Bayesian statistical theory. After the war, some of these same people turned their attention to making Keynesian economics rigorous and scientific by inventing the modern theory of simultaneous equations that could be estimated and used to help monetary and fiscal authorities design good policies quantitatively.

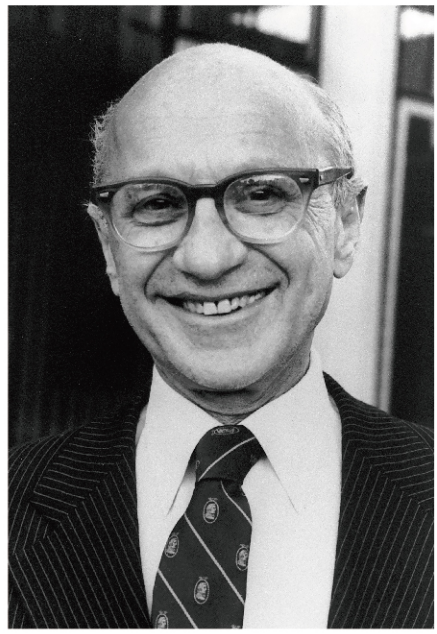
Q. Are there other examples?
A. Many more. A modern example is the development of "algorithmic mechanism design" —
a hot topic now that combines information theory and optimal resource allocation and computer programming to design auctions and other exchange platforms. These are developed and used by companies like Alibaba and Tencent and Amazon and others. Another wonderful application is the recent achievement of "Alpha Go" in using dynamic programming and game theory and computer programming and Monte Carlo simulation to create an artificially intelligent "Go" player that defeated the best human "Go" player in the world!

Q. Don't "artificial intelligence" and "machine learning" employ a different philosophy that contradicts what you just said earlier about the need to combine "theory" and "data" ? Can't data themselves teach you what you should know from experience?
A. No.

Q. Are you saying that machine learning is just an application of statistics?
A. If you remove the word "just" then I'll agree with the statement.

Q. If you agree, why do you want to remove the word "just"?
A. Because machine learning has taken advantage of two very important technical improvements that have empowered researchers to use statistics more widely and inexpensively. The two advances are (a) the acquisition of very large and diverse data sets, and (b) the availability of cheap and powerful and big computers.

Q. Why are working macroeconomists like you and the economists at central banks and treasuries preoccupied with developing models that are sufficiently precise that they can be put on a computer and simulated?
A. Getting a model to be explicit enough and in good enough shape to be put on a computer is a key step in comparing a model with data and in learning about the model from the data. And of course, mathematics is the language that computers hear and speak. So yes, we confess that we want to build models that are sufficiently coherent and precise that they can be expressed as pseudo code that can be handed to a computer programmer who can simulate the model and generate objects that the computer can compare to the objects that we measure.



Milton Friedman, 1976 Nobel laureate in Economics.

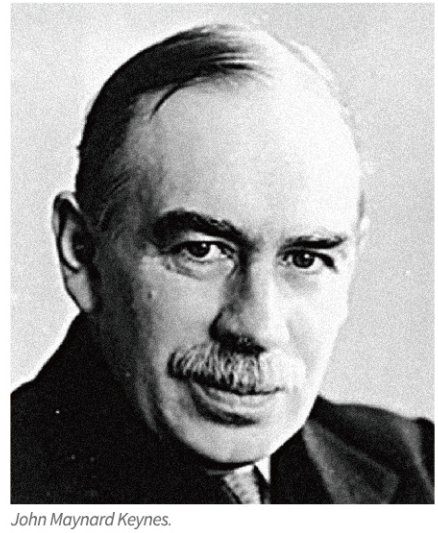
Q. Can you give an example say in macroeconomics? Is there something that the tools you like can uncover that can't be uncovered by mere undergraduate macroeconomics?
A. Yes. For example, the models that central banks use to understand the origins of banking panics and how to moderate them. Also, another example, the methods that credit ranking agencies use to assess sovereign debt and to predict likelihood of sovereign debt crises. Also, the quantitative methods that some researchers use to understand the dynamics of international exchange rates quantitatively and how they are affected by monetary and fiscal policies in multiple countries.

Q. Do you regret that the use of mathematics limits our ability to communicate with policy makers and people who are not economists?
A. Would you ask an engineer or a physicist that question?

Q. Do you think it is research economists' responsibility to promote good economic thinking, or explain what good economic decision-making is, to the public?
A. Yes, and it can be challenging because economics is technical and quantitative, and some members of the public and public officials are less comfortable than others are in appreciating economics. It is important to present things as nontechnically and simply as possible, but at the same time not to oversimplify and to not to neglect important qualifications and tradeoffs. Some of the giants in economics have been very good at expressing key ideas nontechnically, for example Adam Smith and Alfred Marshall. They were masters of logic and language. These are rare skills that I admire very much when I see them in others.

Q. Some of the best writing in economics is purely "literary" and explicitly uses no mathematics at all. Doesn't that give you second thoughts about some of the things you say above?
A. Give me some examples of such good writers.

Q. Walter Bagehot's "Lombard Street" and Milton Friedman and Anna Schwartz's "Monetary History of the United States" and John Maynard Keynes's "Tract on Monetary Reform."
A. Each of those writers had excelled at advanced mathematics as students. If you read their works, you'll see that the authors write clearly about how they reason and how they make inferences from data by combin-



John Maynard Keynes.

ing them with a theory. So, knowing math seems to make you a better writer in natural language too!

Q: Do you think the language of math puts unnecessary restrictions on theory building at times? Some people have made the claim that using math limits the scope and complexity of the models we can build. Or, in order to build a tractable and solvable model, we have to make unrealistic and oversimplified assumptions.

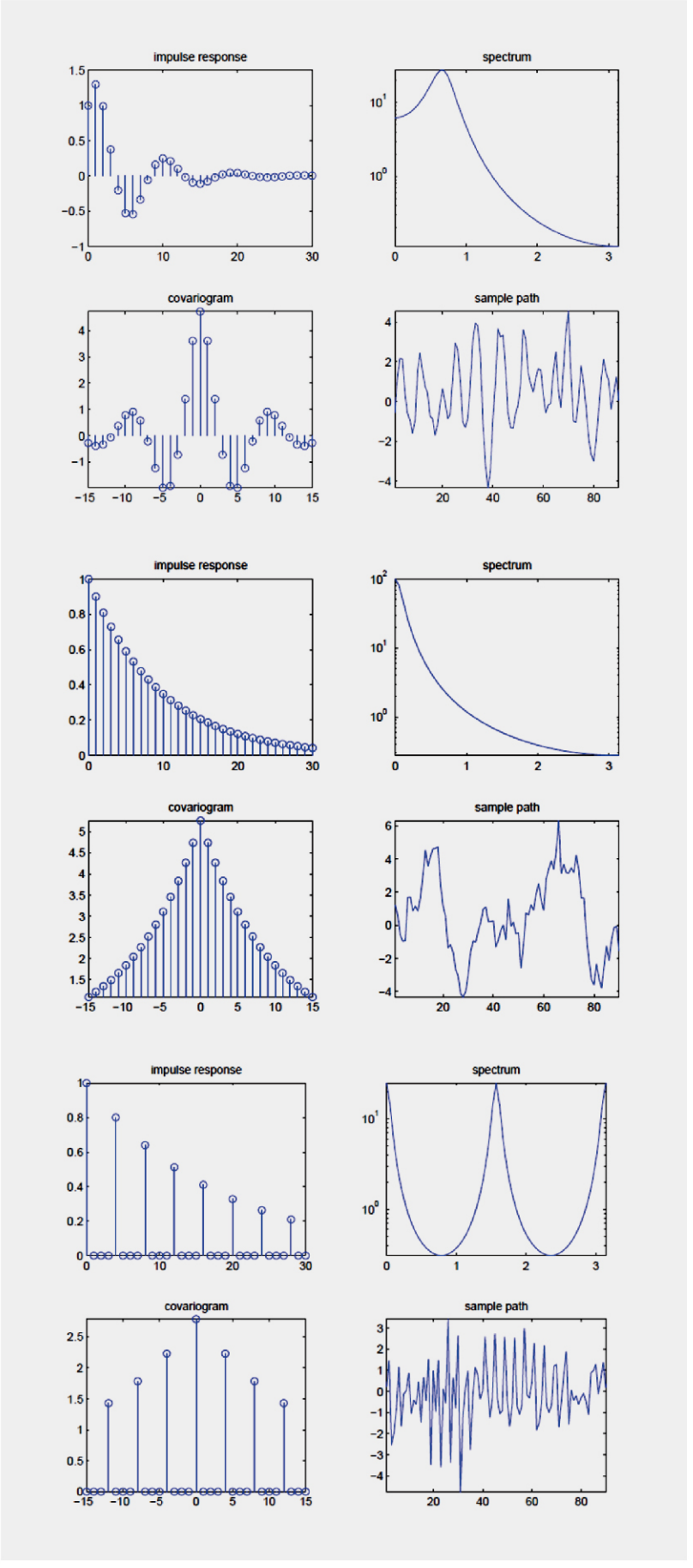
A: The whole point of math is to put restrictions on how we go about building a model. If you can't say it in math, you aren't speaking clearly and explicitly and completely.

If someone thinks that "natural language" is a better tool than math, I recommend that she or he read Stephen Weinberg's account of the history of science in his book "To Explain the World." Weinberg also explains why "unrealistic" and "oversimplified" assumptions have proved to be of practical use time and again.

Q: Would you say that economics should be considered a natural science or engineering, rather than humanities?

A: An exciting part of modern economics is like engineering. Here I have in mind works on "mechanism design" and "optimal regulation" and on "optimal contracts" and on "optimal monetary and fiscal policy." I recommend reading the autobiographical essay by Paul Samuelson in the MIT Press book "Lives of the Laureates." Samuelson explains why mathematical and statistical methods have become so successful and have come to dominate modern economics, and why "literary" methods will not come back. I cannot say these things as well as Samuelson did.

Paul Samuelson, 1970 Nobel Laureate in Economics and a founder of mathematical economics.



Impulse response, spectrum, covariogram, and sample path (from Recursive Macroeconomic Theory)

Interview with Thomas Sargent on the Ph.D. and Elite MA Programs at PHBS

05

questions posed by Professor Shi Jiao

Q: Why is PHBS trying to start a Ph.D. program?
A: Because the Dean and administration believe that economic theory and econometrics provide good ways to understand economic and social interactions and to devise ways to improve peoples' lives.

Q: Who are PHBS's targeted students?
A: Students from China (and other countries too!) who want to learn economics and how it can be used in diverse applications

Q: What are the goals of the program?
A: To empower students by teaching them the fundamental tools and ideas of economics. While economic theory can seem bewildering and immensely complicated because it appears very technical at first sight, in reality there is a unity and simplicity to it if seen from the proper perspective. A small number of results from mathematics and statistics and economic theory serve to unify what seem at first to be diverse areas of economics. By presenting those tools to students in a patient and step-at-a-time way, we intend to empower them and make them confident in understanding and creating economic theories.

Q: We know that the program is quite different from other programs in China, which typically feature an apprenticeship style of advising. Some students call it an "American style" Econ Ph.D. program. In which ways is the program different from other programs in the US?
A: PHBS is not bashful in saying that the program is mainly "copied" from the best programs that we have seen in place at other places. We have tried to copy and combine and improve aspects of the most successful programs that we know about in other countries, in particular, in the United Kingdom at the London School of Economics and in Austria at a master's program that has since been discontinued. Those programs taught students the basics — small amounts of core material that made it easy for students to understand other work based on those foundations.

Q: The design of the program means students will not get a chance to learn applications of the tools until later in their Ph.D. program. How are we going to introduce them to economics applications after the fundamental classes?
A: That will be easy because at Peking University HSBC Business school we have some ambitious and technically very good young faculty members doing applied research in a variety of fields. MA and Ph.D. students will meet them and take courses from them after they acquire the basic tools. And because the students will be tooled up and empowered, they will be able to participate in applied research quickly.

Q: Some students may question whether the basic training is "useful." How should we answer those questions?
A: Be pragmatic. Basic training has been the key to success for many, many fine economists. There are no shortcuts.

Q: Why is it better to introduce the tool set first, instead of introducing questions and let students acquire the tools when searching for answer?
A: Good question. Two answers: the pragmatic answer - learning tools after you have a question just hasn't seemed to work for most people. Why? Because learning tools actually teaches you what are good questions to ask. And while learning tools, one sees example after example of work carefully done, and that is contagious.

Q: What does it mean when you say that you hope eventually to make the curriculum be coherent and connected? And why is that important?
A: An ultimate aim is to coordinate among teachers and present tools and applications in a systematic, first-things-first basis. We hope to find and hire teachers who agree to work as a team and understand what each other are teaching and how courses can complement and build on each other. This is important in order to present ideas and tools to students in an orderly way that will make students feel empowered and smart.

Q: You say that you want the fundamental classes to give a "tool-based" training. What does that mean? And why is it necessary or important?
A: The great French mathematician Henri Poincare said that "Mathematics is the art of giving the same name to different things."
That beautiful quote captures what our philosophy about economics is too. Lots of applications that seem very different have exactly the same logical structure. Learning basic structures — namely, game theory and general equilibrium theory — opens many doors in terms of understanding. Our job as teachers of young people is to show them unity beneath apparent diversity.

Q: Upon finishing the classes, PhD students may have mastered a more solid and complete tool set than faculty. In what ways are their advisor supposed to guide them into various research fields. How will the toolset enable students to cooperate with faculty of the school in a mutually beneficial way?
A: I answer with a confession. I have always regarded teachers simply as more experienced students. As teachers, we are supposed to be learning together with our students. In my long life, time and again I have been inspired (I won't say "forced") to learn new things by students who learned important new things before me and wanted to discuss them with me. Recognizing that students and teachers are actually on the same footing and pursuing the same activities is liberating and enlightening. The greater of experience possessed by the teachers can be an advantage, it is true sometimes; but not always. Sometimes it can be a great advantage to have had less experience and be freer to take a fresh approach unburdened by errors from the past.

Q: That is a very interesting point. If less experience can be a blessing, do you think having too much "premature exposure" to economic ideas before mastering the tools can present challenges to students?
A: Great question. On occasions some of the

ways that macroeconomics, for example, to undergraduates can give students the wrong idea about what scientific macroeconomists at central banks and treasuries and hedge funds throughout the world actually do. That is, it is more than loose storytelling and curve shifting and involves much more math and statistics and careful reasoning. However, I still think undergraduate economics texts are great at getting students interested in economics questions and making them want to learn more about the world and economic analysis. So, on balance, knowing some undergraduate economics will help. But it is not essential. And it can be good to have the attitude that it is wise to challenge what one has learned as an undergraduate and to seek deeper explanations and understandings.

Q: On a separate issue, students who majored in math or statistics may be better equipped when they come to the Ph.D. program. Do you think undergraduate education in economics can be improved in some way to better prepare students to conduct original research?

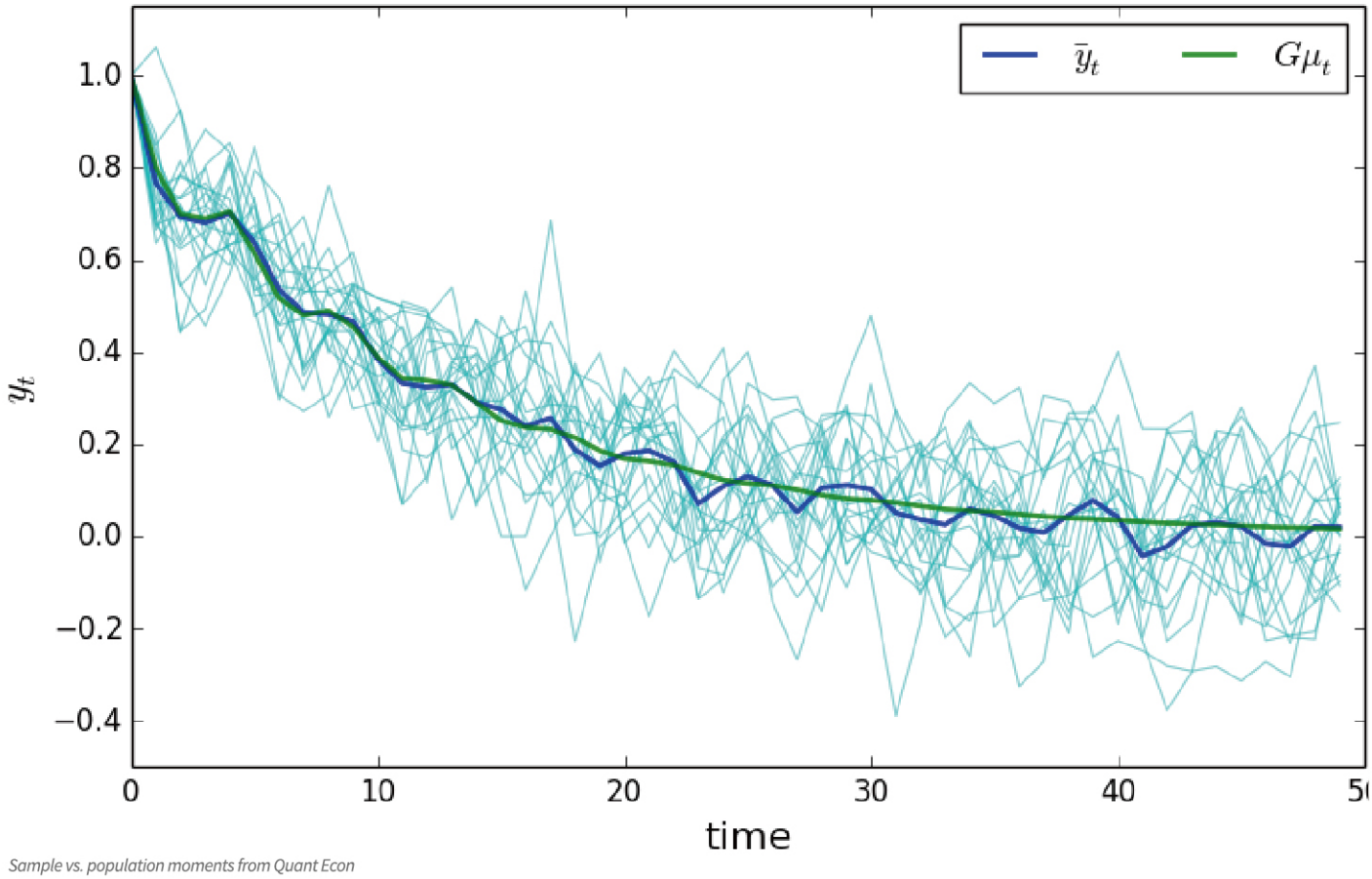
A: Yes, I think that undergraduate economics all over the world can be improved by bringing in more mathematics, statistics, and rigor. Unfortunately, relative to fields like physics, chemistry, and engineering, undergraduate economics is often taught as a "literary" subject (I borrow that description from Paul Samuelson) rather than the more rigorous subject that it is in practice in business and government and in graduate school. I agree with people like Paul Samuelson and Leonid Hurwicz and other great economists who wanted to put more rigor into undergraduate economics. (I have tried to do that in several experimental courses, and it worked very well.)

Q: When it is eventually up and running as PHBS hopes, the Ph.D. program will share the fundamental training with an Elite Master's program. Who are the targeted students of the Elite Master's program? How will the program add value to them?

A: I think that an elite master's program should open doors to ambitious students by providing them with tools and understandings and empowering them intellectually. Our MA program would aim to give graduates many options. Today with the explosive growth of artificial intelligence and machine learning at exciting companies like Tencent and Alibaba and others, there are jobs in industry that are just as "academic" as those at universities. Some of my most talented friends have left universities to join high tech firms because they provide even greater pure research opportunities and facilities than we have at some universities in the US. This is a trend that I expect to continue, and it creates exciting prospects for graduates of an MA program that delivers solid foundations. And of course, opportunities to pursue further studies and a Ph.D. will also open up.

Q: What about our Ph.D. students? Do you think the best job for student with an Econ Ph.D. is to be a researcher at a research university?

A: There are challenging and exciting jobs at universities and colleges and research institutions for sure. But today there are also very good jobs for outstanding Ph.D. graduates at central banks, the IMF, the World Bank, various government and private profit-making institutions. For example, I know some outstanding Ph.D. economists who do excellent research working for Alibaba and Amazon, and at some hedge funds, and at commercial banks and insurance companies. These private institutions also have wonderful hardware and software research facilities.



Sample vs. population moments from Quant Econ

On China

Professor Sargent shares his impression of Chinese scholars and his view on China's recent economic history. Check out the video "Young Chinese People are Pushing the Boundaries"

http://siqef.phbs.pku.edu.cn/en/2019/ONews_0708/11.html

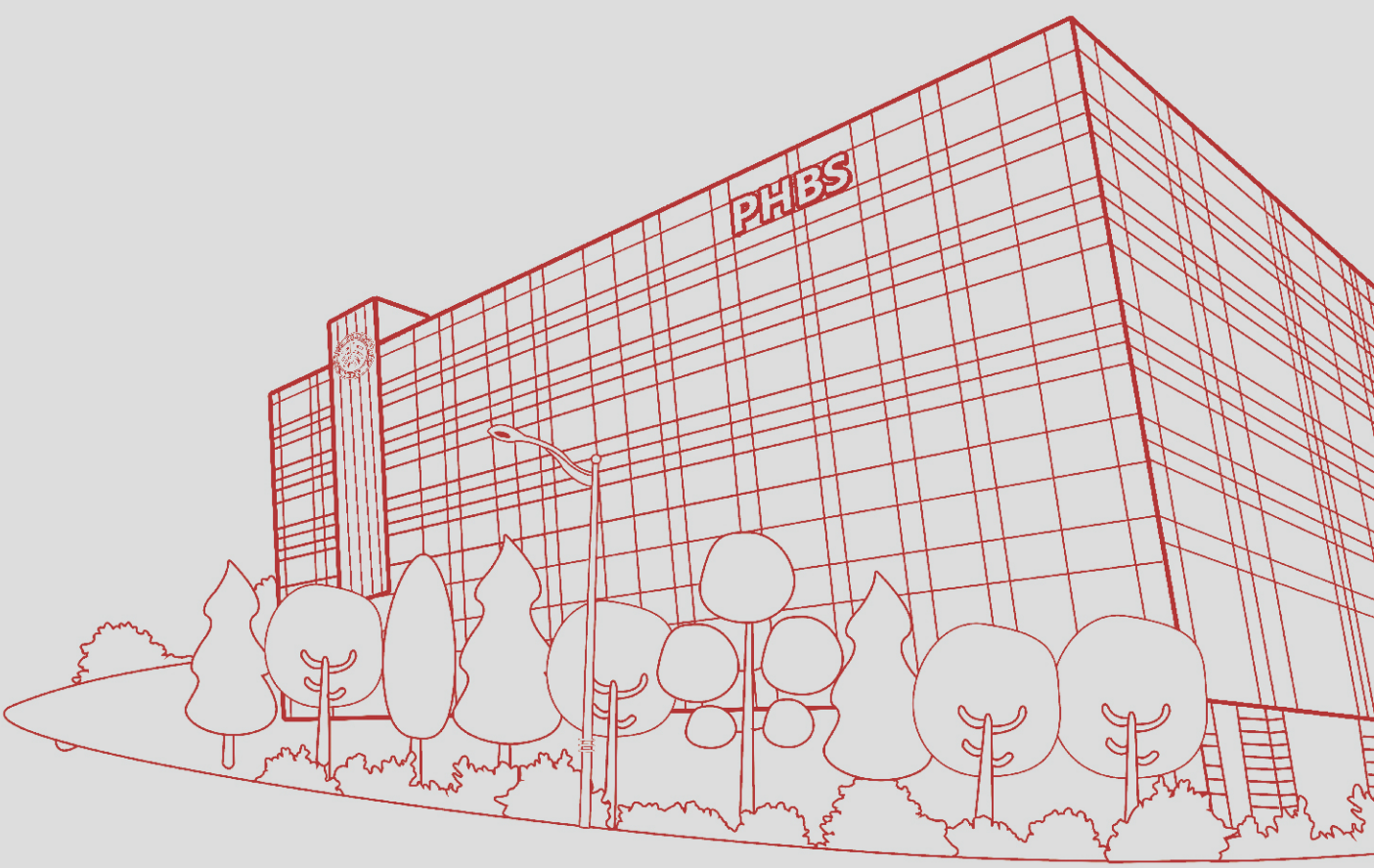
Everyday Economics with a Little Bit of Python

This is a real story: My mother got a call from an insurance sales person. He presented her with an insurance plan for retirement. So long as she pays a certain annual premium to the insurance company for 20 years, she will receive, afterwards, annual insurance payment that is 66% above her original yearly premium, and that will last for as long as she lives! My mother thought it was a great deal. And the insurance even offers other benefits on top of that. How do we evaluate such an insurance? With a little knowledge of economics and a bit help from Python, we can help her decide whether to buy the insurance. Check out our online tutorial Everyday Economics with a little bit of Python.

http://siqef.phbs.pku.edu.cn/python/Insurance.html

The tutorial assumes that you have basic knowledge of Python programming. If you are new to Python, please check out our concise tutorial:

http://siqef.phbs.pku.edu.cn/python/PyIntro-en.html



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