Economic Dynamics: Theory and Computation (MIT Press)

John Stachurski
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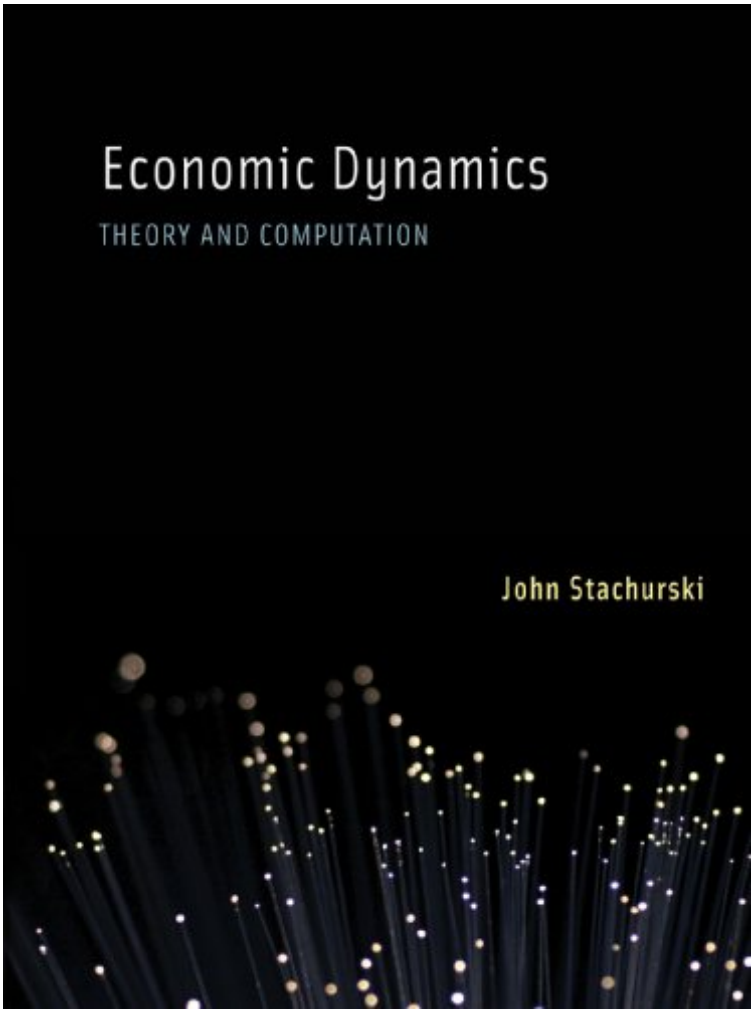

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John Stachurski : Economic Dynamics: Theory and Computation (MIT Press) before purchasing it in order to gage whether or not it would be worth my time, and all praised Economic Dynamics: Theory and Computation (MIT Press):

7 of 7 people found the following review helpful. The book that brought things together for meBy CustomerI don't think I can say enough good things about this book. It has everything that a grad student / aspiring grad student could want in a concise review.Reasons this is great for an aspiring economics graduate student:(1) His style.Stachurski's teaching style is superb. I've never felt quite the same mix of "helping me along" coupled with "challenging me with very serious material," as I have when reading Stachurski's texts (yes, texts -- go to his personal webpage and check out his free Introduction to Econometric Theory!). He somehow has chosen just the right amount of material s.t. I feel like I'm moving along at a good pace (read: impatient grad student always feels the pressure of tomorrow), while never drowning me in "too much too quickly." Maybe he just knows how to target the "average grad student" well. As

another reviewer mentioned, if you know some real analysis (one or two undergrad courses), matrix algebra, calculus, and probability, you'll feel right at home in the pacing. Of course, that describes to a T the "baseline" econ grad student, so maybe Stachurski is simply very good at teaching to that level.***NOTE: This is *not* to say that if you don't fit that description, this book is not for you! (I'm looking at you, eager Research Assistants and slightly-less-prepared first year grad students! *Especially* the latter.) See my notes below about this.***(2) His website, and organic inclusion of programming.You will need to learn to code for macro, *especially* if you expect to do any sort of macro for one of your field. Even if you don't, you will need to know how to code your first year for HW problems. These HW problems will almost certainly be on dark, stormy, goodness-forsaken nights, and my friends, it will not be much fun if that is the night you are learning how to code. Stachurski seemlessly weaves in teaching you proper coding, right along with the rest of the text. He even has a full set of code-oriented lectures on his website and in the book. (The first couple teach you to code, the rest teach you to apply that to basic problems. More on that below.) And he doesn't just teach you to code, he actually teaches you how to take advantage of Object-Oriented Programming (OOP, or "OOPs" for those pun-inclined) in your scientific computing. He teaches you to vectorize. He teaches good commenting and documentation habits. Yeah, these are a lot of things "everyone should do," but I will tell you first hand, quite a lot of scientific coding is atrocious. And you will almost certainly learn those atrocious habits on those dark and stormy nights if you don't make some slight effort not to. Stachurski actually makes "learning the right habits" very easy. Lastly, he uses Python, with the excellent NumPy and SciPy numerical and scientific libraries. I can't think of a better teaching language -- and it's open-source! Bravo!! (I know MATLAB is almost the defacto standard; fortunately MATLAB versions are available, and even if not, there is easy translation between the two languages. Look up Mathesaurus.)Lastly, his lecture notes on the website match up almost perfectly with his book. Fantastic resource to use together.(3) His choice and organization of techniques.There are a few basic techniques that you will use a LOT in macro -- and in micro, and in some finance -- really anywhere that you may use recursive formulations of utility. I suppose people may refer to these as "macro-X;" where X \in {finance, consumption, labor}. Regardless. There are a few baseline techniques that you will *need to know* your first year. Stachurski chooses very good, simple, flexible examples of these, and then teaches them in two parts: (1) "intuitively" + math and code (see chapters 5 and 6), so you can hit the ground running and understand at a functional level what is going on, and then at a heavy theoretical level (see chapter 10) so you *really* know what is going on.I felt like I learned more about how recursive methods fit together and which fit various problems in ~20 pages of math, words, and coding, than I did in large N number of pages out of the bibles of macro, LSP or LS. Not that I didn't also learn from those, and quite a bit at times -- I just learned the intuition and application so quickly in Stachurski's chapters that I was (pleasantly) surprised.Now I'm actually going to say something mildly contra point (2) above. Initially, I was bogged down in his "introductory theory in first chapters" approach. He does have a lot of "building up" theory in his chapters 3 and 4 -- metric spaces, dynamical systems. If you need to quickly get operational -- and let's face it: if you are a grad student, especially in your first year, this is exactly what you need -- you also need a way to quickly apply the material in chapters 5 and beyond. Fortunately, the Python lectures on his website are like a personal class that quickly overviews a lot of the theory in chapters 3 and 4, and then quickly moves to code. Because of the presentation, you can quickly and easily look over a lecture (set of lectures, really) and decide what you need from it. Very helpful for being able to quickly apply the theory.A word of warning: Especially towards the end, the tutorials don't teach you enough of the background material on their own to understand the material -- you really need the book.This is *not at all* to say that the "building up" theory is not helpful. It is incredibly helpful -- Stachurski somehow manages to cover exactly what is needed to have a solid theoretical foundation for all the material he presents later. His theoretical review in Chapters 3 and 4 is some of the best I've seen for quickly acquiring foundational information for economic dynamics. Very good grounding. I am using it now to fill in some gaps in my theoretical understanding, and this is my first choice at of a few options I've used before.As another reviewer notes, the material covered in the first half of the book is material that every graduate student in economics should know. This is a great way to learn it.Here is my suggestion to you, conditional on your place in life:(A) You have some time and need/want to learn economic dynamics for job (RA?)/future grad school/review of earlier grad school:Get the book, work through the book with the lectures as a supplement/guide to new topic when you get stuck. And seriously, if you expect to do any computational work, spend some time with the "learn to program" lectures. You'll be glad you did later. I actually recommend his Python lectures to non-econ people for getting into scientific programming.(B) You are a first-year grad student and man you need to learn and understand/apply these things quickly:Get the book and use tutorials to zero in on topics you need to learn. Good luck.(C) You're a grad student/professional and you need to review topics or fill in understanding of either computational techniques or the background theory:Get the book and use the tutorials (in the book as well as the website) to review and illustrate the topics you are interested in. (I agree with another reviewer that it would be nice to have a few more solutions to some of the theoretical problems.)(D) You want to start using Python for things which you've classically used MATLAB to address:...You can probably get away with just working through the Python lectures - but please support the author! He's done some great work here.Good luck!0 of 0 people found the following review helpful. Rigorous yet comprehensableBy SheffeUnlike some other graduate level texts, this one does NOT feel

like a collection of lecture notes or journal articles slapped together to create a book by an author who seems to convey a cynical and sadistic aloofness towards students.I am working through the second half of this book to bring myself up to speed with measure theory and probability. The author has done an excellent job in explaining hard and complex material. It is not that Stachurski simplifies or dumbs down the material, but rather that he seems to have carefully thought about whether or not what he is saying actually makes sense and is consistent with the logical flow of the material presented. Going through the material is not necessarily easy or a breeze, it is a large investment for the mathematically uninitiated, but the time spent will be in trying to understand the actual mathematics rather than figuring out what the author is trying to say. There are no half-baked ideas or sentences which lead nowhere, and the way exercises are presented motivate the reader to actually work through the material as they go along. All this, along with the fact that there are no (at least none which I have come across) mistakes, induces a feeling of trust towards the author which makes me want to invest more time in going further.One criticism is that there could be more focus on possible economic applications. However, I am not sure if this is what the book sets out to do in the first place.31 of 33 people found the following review helpful. A great way to get tooled up to consume and then produce research in Economic DynamicsBy Azev77This book is a great way for an aspiring economist (early graduate student) to get tooled up to consume (and eventually produce) research in economic dynamics. He begins the book with a fundamental intertemporal optimization problem that is easy to understand, but cannot be solved with most techniques that one learns as an undergraduate (Calculus, Lagrangian optimization...). This problem motivates the reader to learn the basic Analysis and Measure Theory in the following chapters.He does a pretty good job at summarizing the basic results from Analysis that a graduate student should know in 19 pages. (It could have been a bit longer and included some material on inner-product spaces.) I found it better than chapter 3 of Stokey, Lucas and Prescott (SLP). However for someone who wants to do serious work in economic theory there is no substitute for learning Analysis from a textbook that focuses exclusively on it.Using these basic results from Analysis, he introduces the reader to the fundamental ideas of Dynamics in Chapter 4 which is my favorite chapter in the book. Dynamics is an exciting subject that many undergraduate majors don't come across. He provides many famous applications of these methods from the literature including: Long and Plosser (1983), Hamilton (2005), and Quah (1993).His introduction to Measure Theory and abstract integration is extremely intuitive (his illustrations on pages 161-162 help the reader visualize the concepts). His introduction to Measure-Theoretic Probability is very useful in many different areas of economics (from econometrics to finance to macroeconomics). He then applies all of these tools to stochastic dynamic programming in the following chapters which are more technical.At first I wasn't sure whether I liked his idea about using Python code, as many people in economics use Matlab or Gauss. Luckily he provides the equivalent programs written in Matlab on his website. Though I think he might be correct when he writes that Python is quickly gaining popularity. We'll have to see...His website is a good resource for things related to his book, however I would also like to see the code he used to make the illustrations in the book, as well as a solutions manual to the practice problems in the text, as some of them are technical.Bottom Line: if you have knowledge of multi-variable calculus, Linear Algebra, and undergraduate Probability and have some experience writing proofs (basic real analysis), this self-contained book is a great way for you to get tooled up in the methods necessary to understand Economic Dynamics.

This text provides an introduction to the modern theory of economic dynamics, with emphasis on mathematical and computational techniques for modeling dynamic systems. Written to be both rigorous and engaging, the book shows how sound understanding of the underlying theory leads to effective algorithms for solving real world problems. The material makes extensive use of programming examples to illustrate ideas. These programs help bring to life the abstract concepts in the text. Background in computing and analysis is offered for readers without programming experience or upper-level mathematics. Topics covered in detail include nonlinear dynamic systems, finite-state Markov chains, stochastic dynamic programming, stochastic stability and computation of equilibria. The models are predominantly nonlinear, and the emphasis is on studying nonlinear systems in their original form, rather than by means of rudimentary approximation methods such as linearization. Much of the material is new to economics and improves on existing techniques. For graduate students and those already working in the field, Economic Dynamics will serve as an essential resource.

This book is a delightfully novel and thorough treatment of stochastic dynamic modeling. It builds on the well-known results as well as synthesizing the latest developments. Readers will find the many pictures and graphics as well as computer code and examples incredibly helpful. The book is beautifully written by a rapidly rising young star and is a must read for any economist and other researchers who want to learn the tools of dynamic stochastic modeling and apply these tools in their own research. (William A. Brock, Vilas Research Professor of Economics, The University of Wisconsin, Madison)Graduate macroeconomics courses are becoming technically more sophisticated every year. Currently, there are very few books available that introduce the necessary mathematical techniques to understand modern macroeconomics and that are comprehensible to the non mathematician. John Stachurski's book helps fill this void. It is easy to read -- conversational in tone -- and yet it does not shy away from difficult material. But the book is

more than just an introduction to dynamics for the mathematically challenged graduate student. It will also be an invaluable aid to the researcher as a reference book on stochastic dynamics. (Roger Farmer, Department of Economics, UCLA)An invaluable monograph on stochastic dynamical systems that's ideally suited as a supplement for graduate courses in computational general equilibrium, macroeconomics, and asset pricing. The emphasis on economic illustrations and computational codes makes this volume a rich source of tools for students, instructors, and practitioners of economic dynamics. (Costas Azariadis, Mallinckrodt University Professor and Director, Center for Dynamic Economics, Washington University, St. Louis)John Stachurski has written the book that convincingly links theoretical models of discrete time, nonlinear growth models, and the simulation and computation of the applications of these models. He makes these growth models accessible to researchers through the connection of theory and technique. Economic Dynamics covers foundational material useful for students and researchers. I highly recommend this book. (Leonard J. Mirman, Department of Economics, University of Virginia)About the AuthorJohn Stachurski is Professor of Economics at the Australian National University and the author of Economic Dynamics: Theory and Computation (MIT Press).