Quantum Microeconomics
with Calculus

Version 3.2

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Available with and without calculus at

http://www.smallparty.org/yoram/quantum

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README.TXT

> **quantum** *Physics.* A minimum amount of a physical quantity which can exist and by multiples of which changes in the quantity occur. (Oxford English Dictionary)

The "quantum" of economics is the optimizing individual. All of economics ultimately boils down to the behavior of such individuals. **Microeconomics** studies their basic actions and interactions: individual markets, supply and demand, the impact of taxes, monopoly, etc. **Macroeconomics** then lumps together these individual markets to study national and international issues: Gross National Product (GNP), growth, unemployment, etc.

In structure this book—which covers only microeconomics—is not unlike a hiking trip. We start out by putting our boots on and getting our gear together: in Part I we study the optimizing individual. Then we set out on our path and immediately find ourselves hacking through some pretty thick jungle: even simple interactions between just two people (Part II) can be very complicated! As we add even more people (in studying auctions, for example), things get even more complicated, and the jungle gets even thicker. Then a miracle occurs: we add even more people, and a complex situation suddenly becomes simple. After hacking through thick jungle, we find ourselves in a beautiful clearing: competitive markets (Part III) are remarkably easy to analyze and understand.

Part I is the only truly mandatory part of this book, in that later chapters will reference topics from this chapter. For students, this means that understanding the basics from Part I is critical. For instructors, this means that adding or removing material in later chapters should be fairly painless. In particular, the text's modular structure should provide smooth entry points for other material.

About This Book

My hope is for this book to become a successful **open source** endeavor à la the Linux operating system (though on a much smaller scale). More on the nuts and bolts of what this means in a moment, but first some philosophizing.

You can find out more about open source online[1]; of particular note is Eric S. Raymond's essay "The Cathedral and the Bazaar" (available in bookstores and also online[2]). Two of the maxims from this essay are:

- If you treat your [users] as if they're your most valuable resource, they will respond by becoming your most valuable resource.
- ("Linus's Law") Given enough eyeballs, all bugs are shallow.

Raymond's focus was on software, but I believe that these maxims also hold true for textbooks. (In the context of textbooks, "users" are students and instructors, and "bugs" are typos, arithmetic mistakes, confusing language, substantive errors, and other shortcomings.) Regardless, Raymond's essay was one of the inspirations for this book.

Okay, back to the nuts and bolts. Legally, this book is licensed under the Attribution-NonCommercial License[3] developed by Creative Commons[4]. The details are on the websites listed above, but the basic idea is that the license allows you to use and/or modify this document for non-commercial purposes as long as you credit *Quantum Microeconomics* as the original source. Combine the legal stuff with the open source philosophy and here is what it all means...

...For students and instructors This book is freely available online[5]. (One advantage of the online edition is that all the "online" links are clickable.) Please contribute your comments, suggestions, and ideas for improvement: let me know if you find a typo or a cool website, or even if there's a section of the book that you just found confusing and/or in need of more work.[6] If you're looking for something more substantial to sink your teeth into, you can add or rewrite a section or create some new homework problems. Hopefully you will get some personal satisfaction from your contribution; instructors will hopefully offer extra credit points as well.

...For writers and publishers I am happy to share the LaTeX source code for this book if you are interested in modifying the text and/or publishing your own version. And I encourage you to submit something from your own area of expertise as a contribution to the text: the economic arguments for specialization apply nicely in the world of textbook writing, and the alternative—having one or two people write about such a broad subject—is an invitation for trouble. (For an example, see this excerpt online[7].) As mentioned above, this book is typeset in LaTeX, a free typesetting program which you can learn about online[8] and/or from many mathematicians/scientists. You can also submit material in Microsoft Word or some other non-LaTeX format.

[1] http://www.opensource.org
[2] http://www.openresources.com/documents/cathedral-bazaar/
[3] http://creativecommons.org/licenses/by-nc/2.0/
[4] http://creativecommons.org/
[5] http://www.smallparty.org/yoram/quantum
[6] Another lesson from *The Cathedral and the Bazaar* is that finding bugs is often harder than fixing them.
[7] http://www.smallparty.org/yoram/humor/globalwarming.html
[8] http://www.ctan.org

Acknowledgments

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