

Introduction

I once read an article by an academic economist with a title something like “32 Kinds Of General Barrier To Entering an Industry”¹. If this seems a perfectly reasonable kind of thing for an economist to write about, I suggest you put this book down right now and find a really good book to read.

If, on the other hand, you share my incredulity that someone could want to write such an article then this book may be for you. My reaction to that article was disbelief, which was why I continued skimming it: why would anyone want a list of thirty two kinds of barrier to entry? Who was this person who could not understand the general idea of a barrier to entry, or assumed their readers could not? Surely, the author could apply themselves, and think of a thirty third kind of entry barrier? Who could ever commission such a useless article? As a person who uses economics for practical purposes, I cannot bear to read applied economics which cannot be applied. There is very little economics that is more pragmatic than utility economics, and yet I hope you will agree with me that it raises some intriguing theoretical issues.

Who this book is for

This book is written for intelligent people who have the misfortune to be studying utility economics, and want to get it over and done with as fast as possible, without wasting their time learning useless stuff. Having practised this subject professionally for fifteen years I know a lot of useless stuff has been written about utility economics, and none of it appears in these pages – unless it is clearly headed as such. So a section headed “Recapitulation of conventional textbook theory” or some such is clearly code for “Stuff you can skip” unless you happen to be in the position of needing to impress a tutor who is testing your knowledge of conventional economic theory. In this case it might be wise to give the chapter a quick skim, regurgitate the theory and the facts, and then move on to an economic theory (or model) which will actually explain things that puzzle you about network utilities. Things like ‘Why is there just one electricity grid in my home town, precisely two broadband grids in some towns, a dozen or more landline cables in big city centres, and yet no sewer network in the middle of Wales?’ After all, a useful theory is one that helps you create predictions you could not make just using common sense, and neither common sense nor conventional textbook theory will give you a unique answer to all four of those questions².

In practice this means that this book is aimed at undergraduates who have passed Economics 101 and want to deepen their knowledge of business economics,

¹ This is where I am supposed to put an academic reference to this article. For reasons that will soon become apparent I am not going to.

² Conventional theory can answer three of the four, but not the one about the dozen telecoms cables. It would have to assume that the industry’s Minimum Efficient Scale was one twelfth of the market demand, when there is no evidence for this assumption at all.

postgraduates who are beginning studies on industrial or regulation economics, and professional economists who have been given their first assignment in utility economics. To all of you, welcome! Even if utility economics was not your first choice, put that behind you. Network utilities account for between 5 and 10% of a country's GDP, so someone has to study them properly, and it might as well be you. I would obviously be lying if I said utility economics is a laugh a minute, or contains nothing but jaw-dropping eternal truths, but we can at least try to do this properly, and make it as painless as possible.

A note on style

The style of this book is straightforward, simple, and, where possible, graphic, because I believe people studying economics generally have stronger visual than verbal memories. (That's why, if you're reading the hard copy, I have also gone the whole hog and insisted on it being printed in colour). Indeed, if economists really had stronger aural or oral recall than visual recall, textbooks would be written with 'An Ode to Monopolistic Competition' as a sonnet, or 'Axioms of the general sequential model' would be set to a march in rondo form. Indeed, if you have a strong verbal or aural memory you will no doubt have written a handful of limericks yourself on marginal cost pricing or the inutility of Giffen goods, set The Limits To The Hecksher-Ohlin Theorem to a tune by Gilbert and Sullivan, and so on.

What this book covers

This book describes the fundamental economics of all industries which require a physical grid to be built. So, for instance, this book is of no help in understanding the economics of shipping on the Great Lakes because the Lakes did not have to be built. But this book can be directly applied to that industry's closest man-made rival – the canal network of North America – because the canal grid is manmade. And you will already have noticed the difference: there is an infinite number of shipping routes between Sault St Marie and Duluth, all of which are free to access, so there is little question of any concentration of economic power unless it is in the shipping business itself, while (sole) canals are inevitable monopolies which can absorb all the economic rent in a value chain. The fact that canal networks do not nowadays make vast profits is due to the abundance of superior substitutes: road and rail. Two hundred years ago, when these canals were created, canals had no substitutes for heavy transport and so could be very profitable monopolies – unless or until someone built a second, rival, canal.

This book therefore covers the innate economics of grid industries such as canals, rail, water, sewers, gas, electricity, fixed-line telecoms and cable, and oil pipelines, as well as other industries that require a spatial network to be built up, such as mobile phone mast networks, mail systems, parcel delivery networks, on-the-spot news coverage, and all other industrial or commercial distribution and collection networks. The final section analyses some of the experiences of governments around

the world from 1990 to 2012 who restructured and privatised their state-owned utilities, as well as summarising earlier historical developments where relevant.

Network economics or regulatory economics?

This book is obviously not about regulatory economics, and yet it appears to cover exactly the same industries as regulatory economists write about. How can there be two types of economics written about the same industry? One answer is that these really are different subjects. A second, practical, point is that regulatory textbooks tend to be written by economists with little direct experience of the real problems innate in these industries. For example, there is a vast amount of information about their underground assets that the average utility does not know, yet does not wish to admit to its regulator that it does not know. This might seem strange in an asset-intensive business, and is not tolerated in industries such as oil or petrochemicals, but those industries do not have extensive old underground assets. Thus most textbook discussions of 'information asymmetry' between regulator and 'regulatee' are far removed from the real 'game' that the average utility in the world today would see itself playing, if it were honest with itself.

The third, and deepest, answer is that this book is designed to *complement* your regulatory theory course by providing you with a solid grounding in the real 'natural' economics of the utility network industries *before the regulators or politicians get to work*. It is therefore globally applicable, and based on global experiences. Rather than being confined to, say, electricity grids of Europe, this book makes economic comparisons across the world and between industries. It aims to be the general textbook on these industries before considering regulatory issues; it should be essential if you want to test the practical relevance of your tutor's theories.

What this book does not do

As we have just said, this book is not a specialist text on regulation. Although there are brief introductions to energy economics, water economics, natural resource marginal economics, transport economics, and posts/mail economics, this book is obviously not a specialist textbook on any of these subjects. Rather, it attempts to bring together the common features of all these utilities, so that you can compare and contrast, before diving deeply into the one you happen to be engaged with first. Lastly, you already know that this book contains no poems or sheet music, and have correctly appraised that it cannot prop up a door or placate a large angry dog. Readers urgently needing to stave off attacks from dogs are referred to the publisher's text on applied econometrics.

Why this book exists

This book grew out of a series of lectures given at Oxford Brookes University Business School between 2006 and 2012, which in turn reflected my experiences as a

professional utility economist between 1992 and 2005. At Brookes I sought basic modern textbooks for my students online, in University libraries, and even in academic bookshops, but was disappointed to find nothing that was both correct and written at the level of a basic guide to the economics of utilities.

How can this be? Surely this is all a very well known part of microeconomics? Well, it is true that modern general economics textbooks contain standard chapters on the “natural monopolies” that have not changed much since the 1930s. But the problem is that these books are generally written by economists with little direct experience of the utility industries. The authors tend to *assume* that network utilities have strong economies of scale, and therefore fit into a theoretical economic model of an industry with roots that go back to a book by John Stuart Mill in 1848³.

The problem is that modern professional utility economists know that

1. The neoclassical model of static demand and cost curves is not the most useful way to analyse an industry in the twenty first century
2. The evidence for strong economies of scale in the classic utilities (electricity, gas or water) is weak beyond a point that is far smaller than most of today’s utilities. The balance of evidence seems to suggest now that fully-costed grid long run cost curves are rather flat, not downward-sloping, as Mill and co. believed, based on the evidence available to them in the nineteenth century.

Consequently economists need some new theories to explain why traditional utilities are so strongly monopolised. In fact these theories are not desperately original, nor difficult to grasp, and professional texts usually gloss over them in a page or so before delving deeply into specific problems unique to that industry or the subject’s circumstances. The assumptions needed for these theories are far closer to the modern world, and not nearly as restrictive as Mill’s neo-classical assumptions. However, the theories that are actually useful do not show static demand and supply curves being used in practice, which is what basic primer authors wish.

My reaction is ‘Tough! The world is as it is, and we need theories that fit the world, not to squeeze the world into our theories.’ I believe that intelligent, mature students should have the general theories explained in full, so that you are able to come to informed conclusions on your own. And, since I could not find such a book, I have had to write it myself.

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³ Principles of Political Economy Book 2, Chapter 15. However, by Book 5 Chapter 11 Mill calls them “practical monopolies”, implicitly acknowledging that there is little that is ‘natural’ about a man-made canal, water, or gas grid (there were no electricity grids in 1848).