

Real Options, False Choices: A Final Word

Eli M. Noam

Columbia University

The articles in this book have been fascinating, and for several reasons. The first is the authors — their quality, diversity, readability, and engaging combativeness. The articles contained here were written by some of the most creative thinkers on the subject of the economics of telecommunications, theorists with a practical bent and practitioners at home with economic thinking.

The second owes to the book's approach: real options is fairly new as theory, and even newer as an application in telecommunications. To the best of the editor's knowledge, this is the first book to apply the new theory to the important and dynamic area of telecommunications.

But perhaps the most interesting aspect of these discussions is what they reveal about the process of knowledge creation and dissemination — how ideas are created and why, and how some ideas achieve prominence, while others meet indifference or generate ferocious opposition.

On one level, the creation and rapid prominence of real options theory tells us something about the new pecking order of the economics profession. For many years, finance theory did not enjoy great prestige. Its discounted cash flow models were boring, slow changing, and derivative. And its subject matter was narrow, materialistic, and applied. But now, as the ascendance of real option theory demonstrates, the flow of ideas has reversed its course.

Today, finance theory is exporting new tools to mainstream economics, such as to the valuation of physical assets and projects. One can speculate why finance theory has become so prominent. It is partly owing to the resources of Wall Street, which richly

reward those who can provide the reality – or hope —of giving investors even the minutest of edges. The popularity of MBA programs that provide a solid institutional base is another factor. Yet another is the growing mathematical irrelevance of standard microeconomic theory. Whatever the reason, finance theory is hot, and with it real options theory.

This book demonstrates that another discipline is to be taken seriously: engineering. Once the theory needs to be supplemented with real numbers about cost — something one would think economists are good at — they pass the buck to engineers and their network models, never minding that the underlying assumptions on prices would not pass muster at a graduate seminar. Thus, we have lawyers – the decisionmakers in the regulatory sphere – leaning on economists, and economists leaning on engineers, and engineers taking the lawyers' and economists' decisions as exogenous, each bootstrapping its validation from the other.

On a second level, the vigorous discussions in this book show that while ideas matter to the world, the world matters even more to ideas. This is not to denigrate the importance of real options theory if one suggests that it would not have achieved the same visibility if it had been primarily useful to a coterie of academic theorists. But as it happens, the idea of real options has implications, and these implications have value as powerful arguments in high-stakes debates. In telecommunications, these ideas could materially affect the interconnection charges paid by some companies to others. For some long distance companies, these payments used to account for about 40 percent of their overall expenditures; and for the local exchange companies, the receipts were over 20 percent of their revenues.

Similarly, real options theory relates directly to the payments that various companies make towards the financing of universal service in the United States, a redistributive system whose magnitude has been estimated, depending on definition, methodology, and interest, to be anywhere between about \$4 and \$20 billion. Given those stakes, it is not

surprising that supportive ideas are in demand by both sides, and that they receive wide play by their proponents.

Unsurprisingly, different economic models lead to different conclusions. An “efficient component pricing rule” (ECPR) has been advocated by several distinguished economists. This rule is advantageous to the incumbent local exchange companies charging high prices, and has received more attention from regulators and judges than it might otherwise merit. Other pricing models result in low interconnection prices, and are therefore favored by new entrants. Forward-looking long-run incremental cost (TSLRIC) is such an approach, and it, too, is supported by equally distinguished scholars. It is supplemented by planned-economy style, engineering-based proxy cost models that are advanced by the staunchest advocates of free markets. Various experts are lining up before the regulatory decision-makers, brandishing competing theories with well-compensated passion.

Who is right? Obviously, it often depends on the assumptions. But in a larger sense, it makes no difference which theory is “correct.” It all depends on the policy goals. Regulators do not really care about theory, but about outcomes, along the lines determined by the political system. Interconnection prices are the tool and economic theorists provide the rationale.

Thus, when the policy goal is to expand basic telephone service or to keep basic telephone prices low, regulators will be supportive of the incumbents, as long as they recycle their gains into wide and affordable connectivity. In that situation, the cost models selected will tend to be along the lines of the “*efficient component pricing rule*” or “*distributed cost*.” Where large customers are to be favored, “*Ramsey pricing*” provides an efficiency rationale, but where consumer interests are promoted, “*network externalities*” are being factored in. More recently, as the policy goal has shifted to local competition, regulators have adopted “*long-term marginal cost*” models, whose fundamental advantage to entrants is that they are lower in price by reducing or postponing their contribution to fixed costs. And when regulators have tried to accelerate

the pace of entry into local competition, they extended this approach into cost that is “*forward looking*.” That phrase – as deceptively positive-sounding as “efficient components” was before it — means that the costs of a network are based on present and future prices, which tend to be lower than the “historical” ones, given the price trends of anything electronic. There are some strong theoretical arguments for such a methodology, but it is doubtful that this approach would have been chosen if the price would not trend conveniently down, but were instead going up, thus slowing down entry.

There is nothing wrong with regulators’ aggressively promoting their basic policies through the levers they control, such as interconnection prices. Competition had positive impacts on the telecommunications industry’s performance in countries that have adopted it, and to reach such a market structure may require a temporary squeeze of entrenched incumbents to prime the pump. Yet the existence of an outcome-determined pricing model is not being openly acknowledged. Instead, regulators cloak their choices in a pseudo-scientific garb, using economics and engineering as rationalizations for what they wish to do anyway, while pretending to be led by the evidence.

This, of course, happens in regulation all the time, and everyone —except some of the economists involved —seems to understand it. Yet there is a deferred price to labeling policy preferences as economic truth because policies are temporary, shifting with circumstances. For example, once market structures have become more competitive, other pricing policies will be appropriate. It is difficult enough to wean any infant industry from regulatory protection. But if the previous model has been presented as truth rather than preference, it will be still more difficult to change.

Real options shake up the debate with new arguments. Its proponents argue that sunk costs, depreciation, and the option value of investments should be considered in a way that would tend to raise the prices for interconnection and universal service contribution. Clearly, the incumbent LECs, having lost the previous rounds, like anything that reopens the debate. New ideas that challenge that status quo in their direction will therefore find their favor.

It would thus be easy to conclude that the new carriers of ideas are the champions of the old carriers of transmission. Yet if we measure new concepts only by the cynical yardstick of *cui bono*, debates over ideas would be pointless. One hopes that out of thesis and antithesis, however motivated, a higher form of understanding emerges. This is fundamental to scientific discourse, and no cynicism should obscure the effectiveness and success of this process.

And this forward and upward movement seems to have happened already in this project. Even several of the forceful critics of the approach largely concede its basic theoretical validity and argue against a specific application: incorrect assumptions of irreversibility, missing symmetry in both directions, lower sunk cost, management flexibility, etc. In other words, they are forging a new synthesis, against which other views can array themselves.

The next generation of discussion will inevitably challenge and improve the real options model. The truth is that the very applicability of finance-derived models to physical assets is far from settled. For securities, certain assumptions are made within the context, e.g., of the Black-Scholes model, and these are then adapted to different circumstances. Yet once this approach is taken for non-securities, the approximations may become quite distant, the noise/information ratio changes dramatically, and the model might not be appropriate. Work on the interactivity of real options is only in its infancy, and might reach different conclusions.

Similarly, the proxy cost models are a vast improvement over the black box estimates of the past. Even so, they are not the end of the story. And how could they? Huge revenue flows are directed by vast computer-based engineering models of valuation, which are based on assumptions that economists rarely support in other contexts. It should be possible to engage in this debate without working for any side or planning to do so.

In the process of intellectual discovery, the models will become more refined, more realistic, and more complex. Economists and regulators will justifiably take pride in them. In time, they might actually resemble the outcomes of market forces. But if so, why not try the real thing, market forces? Let us understand that all of the heated discussion is about a transitional system of pricing, bridging the period between monopoly and competition. If the system of administrative pricing becomes permanent, we have failed. There is a real cost in trying too hard to be exact, and tying up the policy system in developing the most advanced models. Most likely, it is better to be quick, approximate, and flexible. In that sense, there is a real societal option cost to the search for the best regulation, even if economic theory benefits in the meantime from the attention.