



## COMPETITION

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*"You don't want to be the best of the best, you want to be the only one that does what you do."*

*– A favorite quote of California Lt. Gov. Gavin Newsom, which he attributes to the late Jerry Garcia of the Grateful Dead*

### **KNOWLEDGE IS DANGEROUS IF YOU FORGET TO THINK**

I'm a great believer in the principles of a liberal undergraduate education. The guiding notion is that educated people should have familiarity at an introductory level with a broad range of subjects, complementing with that breadth a deeper understanding of one particular field, the college major. The distribution requirements in a traditional college program are terribly important. They act as a safeguard against narrow-mindedness, and help students avoid too doctrinaire a view of the world emanating from the major. Studying a range of subjects, we learn that no single discipline has a monopoly on wisdom, and that different fields of study and modes of thought provide different lenses through which to understand the world around us.

Consider economics. An economics major can become an expert social scientist, but a liberally educated one should also understand how much economics can explain, and how much it can't. The comparative precision of the physical sciences shows how noisy data are in the social sciences. Mathematics reminds us of the limiting assumptions we make in adopting stylized models of the world. History and political science teach us that not every ambition is economic, while art and literature remind us that ambition is only one of many drives that motivate our behavior and shape our society.

At times, the distribution requirements seem to backfire. Many college students take an introductory economics course at some point. We tend to remember the principal message of freshman microeconomics as saying that free market competition produces the most economically efficient outcomes. From this we justify a belief that allowing businesses to compete without any type of policy interference will lead to the greatest prosperity.

The trap is in forgetting what our freshman economics professors meant by competition. When they taught us about “perfect competition,” they were describing a model of a market consisting of a large number of identical, price-taking producers and identical, price-taking consumers. In this idealized condition, the “invisible hand” guides production to high levels, drives prices to low levels, and guarantees our prosperity. But this economic model isn’t what we ordinarily have in mind when we think about competition. Instead, we usually think about the more familiar, tournament-style competition that determines who wins the World Series or establishes a dominant, monopoly position in an industry. Many businesses don’t just sell undifferentiated products at a market price equal to their marginal cost of production. Rather, they try to outdo their competitors through technology, with service, by developing superior offerings, or by paring their own costs to the point where they can profitably compete on price. Most important, they compete to establish and defend advantages that allow them to earn profits by charging more than their marginal cost of production, precisely the outcome that the Economics 101 model of perfect competition rules out. There’s the problem. We remember the theoretical benefits of perfect competition, but forget that they don’t always arise from the kind of competition we actually see.

### **IDEALIZED COMPETITION: THE BREAD SUPPLY IN LONDON**

Who manages the supply of bread in London? As British economist Paul Seabright points out, the answer — nobody — only seems obvious to people that have spent our lives in an economy like ours. Like so many questions in economics, the more deeply we think about it, the stranger and more difficult this one becomes. Mr. Seabright presents the issue this way:

About two years after the break-up of the Soviet Union I was in discussion with a senior Russian official whose job it was to direct the production of bread in St. Petersburg. "Please understand that we are keen to move towards a market system", he told me. "But we need to understand the fundamental details of how such a system works. Tell me, for example: who is in charge of the supply of bread to the population of London?" There was nothing naive about his question, because the answer ("nobody is in charge"), when one thinks carefully about it, is astonishingly hard to believe. Only in the industrialised West have we forgotten just how strange it is.<sup>1</sup>

The classic treatment of Seabright’s Russian friend’s question is Adam Smith’s 1776 *Wealth of Nations*. Smith examines the advantages of an efficient division of labor, and explores the role of prices in stimulating the necessary adjustments in production to

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<sup>1</sup> Paul Seabright, *The Company of Strangers: A Natural History of Economic Life*

match variations in demand. Think about the production of bread for London or any other city. Somehow, farmers grow about the right amount of wheat. Millers buy that wheat and process it into about the right amount of flour. Bakers buy that flour and bake it into about the right number of loaves of bread. And grocers distribute that bread in about the right quantities to the families that use it. This mind-boggling system works without any explicit coordination. This decentralized, market-based self-regulation is what Adam Smith dubbed the “invisible hand.”

The invisible hand is astonishingly effective at keeping bread on grocery store shelves. As we learn in introductory microeconomics, the system determines the price and quantity of bread by balancing supply and demand through free market competition. How could a central authority do a better job? Viewed in this light arguments for reduced government interference in business seem entirely plausible. After all, if the invisible hand of competition does a better job than government at allocating resources, then government should just get out of the way.

Let’s take a closer look at what perfect competition really means. The basic setup for a model of perfect competition requires that both producers and consumers be small, numerous, price-takers — that is, no individual producer or consumer can influence the market price of the product under study, so the role of price in their decisions is as an external variable, which they cannot influence. We generally also assume that producers seek to maximize profits, and further, that no barriers exist to prevent producers from entering or exiting the industry.

There is plenty material on perfect competition available on the web, so I won’t go through the full analysis here. Here are the highlights: Because firms seek to maximize profits, each one will choose the level of output at which its marginal revenue (MR), the amount by which an additional unit of output increases its revenue, equals its marginal cost (MC), the amount that extra unit costs. If  $MC < MR$ , then the firm will increase output because it will earn more profit at a higher level of output, and if  $MC > MR$ , the firm will cut back, because it is losing money on its last unit of output. Now, here is where the price-taking assumption comes into play. In perfect competition, a producer can’t influence price by changing its output, so  $MR = P$  (where  $P$  is price) for every level of output the producer might choose.

The marginal cost condition assures that the firm will earn less profit if it increases output, but it doesn’t say anything about the firm’s total profit. That depends on its average cost at its chosen level of output. This is where the absence of barriers to entry and exit comes in. If the technology for producing the product under study is well-known and not hard to set up at just about any reasonable scale (bread-making comes to mind), entry barriers are low. Firms that are not able to control their costs will fall away, while

more efficient ones (lower average cost) will thrive and produce more (the level of output where  $MC = P$  will be higher).

So now we have an industry in which a large number of small, price-taking producers maximize profits by providing output to sell to a large number of small, price-taking consumers. What happens if producers in our industry earn profits? If there are no barriers to entry, then the profits will draw new entrants into the industry, driving up production and (in the case we usually imagine, anyway), driving down price. Existing firms will adjust their own production levels, and at the new price, some may even withdraw. But eventually, in the usual model the size of the industry adjusts to exactly that point where producers earn zero profits, and unless some change occurs in the environment, such an outcome represents a stable equilibrium.

The term “profit” in our model of perfect competition is sometimes a source of confusion. When we say that producers in a competitive equilibrium earn zero profits, that does not mean they might as well just pack up and go home. The zero-profit condition means that every factor of production — including the capital that producers have to invest in their businesses and the effort and risk that the entrepreneurs in the industry undertake — earns its true economic cost. Especially in the case of capital and the entrepreneurs’ own efforts, those true economic costs include their opportunity costs — the amounts they are not available to earn elsewhere.

Viewing an example like bread-making, it’s no wonder that we tend to romanticize perfect competition as the ideal expression of free-market economics. After all, in models of perfect competition, we usually see the maximum output and lowest prices, because if output is too low and price too high, then new entrants will take advantage of, and eliminate, that condition. The zero-profit condition also means that firms apply economic resources to their most efficient uses. Competition prevents factors of production from earning more than their opportunity cost, but free entry and exit allow owners of those factors (including their own labor) to allocate them to their best use. Perfect competition gives us high output, low prices, and efficient use of resources. So why shouldn’t we just get out of the way and let businesses compete?

## **INDUSTRIAL COMPETITION: MORE LIKE A GAME OF MONOPOLY**

The problem with perfect competition is that it doesn’t occur very much. In many industries, the rivalry among firms is nothing like an economist’s model of perfect competition, and much more like a game of Monopoly. If you’ve ever heard someone in business talk about market share, or economies of scale, or pricing power, or intellectual property rights, or strong brand identification, they are describing their efforts to create an environment that’s as *little* like perfect competition as they can. Firms battle for a

position in which they can dominate a market and achieve economic rents — those profits in excess of opportunity costs — the real trophy in the tournament for business supremacy. The model of perfect competition is really only apt in areas of the economy, like bread making, where decentralized production and distribution can thrive against large-scale enterprises. The competition in big business is more likely to remind us of professional sports than freshman economics.

Companies attempt to accumulate assets, establish pricing power, and in many cases absorb or eliminate rivals. Think about your mobile phone. While we customers may feel like small price-takers, the providers of the devices are fierce rivals, seeking to establish pricing power, gain market share, and potentially eliminate one another. Today we may think mostly about Apple and Samsung phones, but not long ago Blackberry and Motorola were dominant names. The market for mobile phones, with its few dominant producers, isn't like the market for bread in London, where perhaps hundreds or thousands of small bakers in a city supply a similarly large number of grocers. To understand the difference between bread and mobile phones, we need to review the difference between perfect competition and its economic opposite, monopoly. I'm interested in monopoly because it represents total victory by one firm in the contest for dominance of an industry or market.

A producer in perfect competition must accept the market price as given, and so its marginal revenue equals the price, which it can't alter. That's not the case for a monopolist. A true monopolist produces the entire output of its industry, so it can choose any point on the market's demand curve<sup>2</sup>. As with a price-taking producer in perfect competition, we assume that the monopolist will seek to maximize its profit. At the profit-maximizing quantity, marginal revenue will equal marginal cost ( $MR = MC$ ). But where a competitive producer has to accept price as given, the monopolist's choice of quantity also *determines* the price, based on the demand curve.

In a model of monopoly with a downward-sloping demand curve, marginal revenue doesn't equal price. Instead, if the monopolist increases production, and that increase requires a lower price, then the marginal revenue is the *new* price, *minus* the revenue the producer loses because the lower price applies to the whole quantity. Say that at a quantity of 10 units, the price is \$100. Total revenue is \$1000. If at a quantity of 11 units, the price falls to \$95, then total revenue is \$1045. With such a demand curve, the marginal revenue from selling that 11<sup>th</sup> unit is only \$45, even though the price is \$95.

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<sup>2</sup> Just as a refresher, the demand curve plots the relationship between price and the aggregate amount of a product that consumers in the market are willing to buy at that price. We generally imagine that demand curves slope downward – that consumers demand smaller quantities as price rises.

With a downward-sloping demand curve, a monopolist's marginal revenue is generally less than the price for that quantity the monopolist chooses to produce. This means that the quantity where marginal cost equals marginal revenue (the monopolist's optimal quantity) is usually lower than the quantity where marginal cost equals price (the optimal quantity in perfect competition). So the basic comparison between monopoly and perfect competition comes down to two points: In monopoly, prices are higher and the quantities produced are lower, than in perfect competition.<sup>3</sup>

### **AS USUAL, REALITY IS SOMEWHERE IN THE MIDDLE**

Among large, publicly-traded companies, we don't find many examples of either pure monopoly or perfect competition. We mostly find oligopolies — industries with a few dominant firms. Models of oligopoly are more complex than those of pure monopoly and perfect competition, and they rely on a broader set of assumptions. Models of oligopoly generally tend to predict that oligopolies' output and prices will fall between those of monopoly and perfect competition. An oligopoly with more participants will behave more like a competitive industry, while as the industry's concentration increases, it increasingly resembles a monopoly — output falls, and price increases.

One high-profile industry that has concentrated significantly in recent years is the airline industry. A series of mergers<sup>4</sup> has reduced the number of large carriers in the US market to four — Delta, United, American, and Southwest. These four now control about 80%<sup>5</sup> of the US air travel market.

Let's look at what has happened to output and prices in the airline industry in the past ten years. We'll look at four measures. The usual measure of total capacity for an airline or the airline industry is Available Seat Miles (ASM), which is just what it sounds like. If a plane with 200 seats flies a route of 1000 miles, that flight accounts for 200,000 ASM. Airlines measure their effectiveness in selling seats by counting Revenue Passenger Miles (RPM). If our same 1000-mile flight carries 180 paying passengers, then it accounts for 180,000 RPM. The ratio of RPM/ASM is the *load factor*, which measures capacity

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<sup>3</sup> Adherents to supply-side schools of economics take production as their starting point, arguing (reasonably enough) that we can't consume anything until someone produces it. They generally assert, then, that increased production is the engine of economic growth, and that if prices are flexible enough, they will adjust to where demand will take up whatever supply is on offer. Supply-siders sometimes face an uncomfortable tension between deregulation aimed at promoting competition and deregulation that permits an increase in monopoly power.

<sup>4</sup> Delta and Northwest merged in 2008, United and Continental merged in 2010, Southwest and AirTran also merged in 2010, and American and US Airways merged in 2013.

<sup>5</sup> This and the data to follow are from the MIT Airline Data Project, <http://web.mit.edu/airlinedata/www/default.html>

utilization, or for passengers, how crowded flights are. The load factor in our example is 180,000/200,000, or 90%. Finally, airlines measure their price levels by calculating revenue per RPM. If the average paying customer pays \$250 for that 1000-mile flight, then revenue per RPM is 25 cents.

In 2004, before the first of the wave of mergers, total system ASM for the US airline industry came in at 999 billion available seat miles. That figure peaked at 1.039 trillion in 2008, and then fell back to 1.012 trillion in 2012, the last year for which MIT has figures available. So from 2004 to 2012, system ASM grew by about 2%. Over the same interval total demand increased from 751.6 billion RPM (2004), to a peak of 840.9 billion in 2007, slipping to 832.7 billion 2012. The increase over the whole interval was 11%. That means the industry's overall load factor increased from 76% in 2004 to 83% in 2012. More significant still, revenue per RPM for the overall US air travel industry increased from 11.09 cents to 14.35 cents, an increase of almost 30%. So if you think flights are both more crowded and more expensive than they used to be, it isn't just your imagination. By concentrating, the airline industry has succeeded in raising prices, and at least managed to avoid increasing capacity even as demand has grown.

## **MONOPOLY: YOU'D RATHER BE AN INVESTOR THAN A CUSTOMER**

Industry concentration may not be so good for consumers, as it diminishes consumer choice and tends to increase prices. It often isn't so good from a public policy standpoint, either, as it can reduce output, drive inflation, retard economic growth, and increase the power of producers to thwart regulation and ignore externalities. However, establishing a monopoly position can be a boon to investors. To illustrate this point, let's look at the effect of last year's merger between American and US Airways on the stock, not just of those two companies, but also of the *other* three large carriers, Delta (DAL), United (UAL), and Southwest (LUV). We don't have good stock market data for American prior to the merger, because the deal also helped that firm emerge from bankruptcy. We can, however, trace the movements of US Airways (LCC), and the post-merger American Airlines Group (AAL).

American and US Airways announced their merger on February 14, 2013. All the airlines slipped in value on that day, perhaps because the deal would mean that then American would avoid going through a bankruptcy reorganization on its own, which could have resulted in a complete dismantling. Instead, a merger might preserve more of the airline's capacity. However, on August 13, the US Department of Justice announced a lawsuit that would seek to prevent the merger on antitrust grounds. That impediment hit LCC hard, but DAL and UAL also fell sharply on that day. Conversely, all the airlines rose on November 12, when the American, US Airways, and the Justice Department announced that they reached a settlement; on November 27, when the

bankruptcy court approved the deal as part of American’s plan of reorganization; and on December 9, when the merger actually closed. Over the full span of these events, February 14 to December 9, the four airlines’ stock prices rose by amounts ranging from +43% to +95%. Over the same interval, the S&P 500 rose by +19%.<sup>6</sup> I include the S&P 500 performance as a proxy for the portion of each return that we might reasonably attribute to the overall market, rather than the specific events concerning the merger. The table below gives details.

Stock Price Performance Events Related to American Airlines – US Airways Merger					
	DAL	UAL	LUV	LCC/AAL	S&P 500
2/14/13 Deal announced	-3.7%	-1.2%	-1.2%	-4.6%	+0.1%
8/13/13 Antitrust suit	-7.1%	-7.5%	-1.8%	-13.1%	+0.3%
11/12/13 Antitrust settlement	+2.4%	+4.2%	+1.2%	+1.1%	-0.2%
11/27/13 Bankruptcy court ok	+1.0%	+1.0%	+2.2%	+0.7%	+0.2%
12/9/13 Merger closes	+2.3%	+2.2%	+1.0%	+9.1%	+0.2%
2/14 – 12/9 Overall	+95.4%	+43.4%	+59.3%	+67.8%	+18.9%

We can’t say that the American-US Airways merger accounts for all of the movements of the airlines’ stocks during 2013. However, those companies’ strong overall results, and their stocks’ reactions to key events concerning the deal, strongly suggest that the market reacted very favorably to the increase in industry concentration that came about as a result of the merger.

## CONCLUSION — BE CAREFUL WHAT YOU WISH FOR

We tend to hold up competition as an economic ideal, expecting it to bring about economic growth, prosperity, and efficiency. But we need to be careful when we think about competition. Do we mean the ideal of perfect competition we learned in freshman economics, or tournament-style competition, more reminiscent of the contest that decides

<sup>6</sup> Source for stock price data Yahoo! Finance; return calculations by author.





who wins the World Series? Business leaders compete (tournament-style) to eliminate or suppress market competition, because only then are they able to produce the economic rents that generate returns in excess of the cost of capital. As investors, we reward those firms that are able to win that contest. The danger, though, is that in a completely unfettered economy, the tournament-style competition to establish and protect monopoly rents will result in reduced output, lower prices, and stagnation — exactly the opposite of the results we learned as freshmen to expect from the free market.

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