Admission Examination for Shirai Seminar March 11, 2015

1. Suppose a production function for a shirt factory is given by $q = K^{1/4} \cdot L^{1/4}$ where q is the output level, K the level of capital input, and L is the level of labor inputs. The cost of capital and the wage are denoted as r and w. We assume all markets are perfectly competitive.

Answer following questions;

(a) Does this production function for this shirt factory show increasing returns to scale, decreasing returns to scale or constant return to scale?

(b) What is the definition of cost function?

(c) What is the definition of factor demand function?

(d) Set up the cost minimization problem of this shirt factory owner.

(e) Write down the first order conditions for the minimization problem set up just above.

(f) Solve for the minimization problem set up in (c) and derive factor demand functions.

(g) Derive cost function for this shirt factory owner.

(h) Let p be the price of a shirt this factory produces. Derive supply function of shirt for this factory owner.

(i) Suppose that there are n identical factories in the shirt industry. Derive the industry supply function for the shirt industry.

2. Answer following questions.

(a) Explain the relationship between the propensity to consume and the multiplier.

(b) Explain the tradeoff in monetary policy.

(c) Explain what is the fallacy of composition. Give an example.

(d) Explain the clouding out effect of government spending.

3. State the definition for each of the following concepts

(a) Pareto optimal allocation of resources
(b) moral hazard
(c) savings
(d) business cycles
(e) comparative advantage
(f) double coincidence of wants

4. Summarize the following essay in 200 words in English or 800 letters in Japanese.

The Blurry Line Between Competition and Cooperation

By Timothy Taylor

What is the opposite of "competition"? If you fear that this is a trick question and run off to check a synonym/antonym dictionary, you will find an answer that probably came to mind in the first place: "cooperation." Indeed, many people view economics as morally suspect because they perceive economics as emphasizing competition, rather than the arguably more virtuous approach of cooperation.

When I bump into this concern, I often respond that economics seeks to analyze the world as it is, not as we might prefer it to be. We live in an economy in which consumers often seek the best deal; workers commonly seek the job with the best mixture of work conditions and compensation; and firms seek higher profits. If you want to discuss the real-world economy, diagnose problems and suggest solutions, the presence of competition and self-interest among individuals and firms is typically a useful working assumption. The study of economics and public policy would be quite different in a hypothetical world of perfect cooperators.

This response typically works, in the sense that the questioner is more or less satisfied with having received an answer. However, I fear that it concedes too much ground. Specifically, it risks conceding that competition and cooperation are, indeed, opposites, with vice on one side and virtue on the other. But this is a false dichotomy.

Instead, a concept of cooperation is actually embedded in the meaning of the word "compete." According to the *Oxford English Dictionary*, "compete" derives from Latin, in which "com-" means "together" and "petĕre" has a variety of meanings that include "to fall upon, assail, aim at, make for, try to reach, strive after, sue for, solicit, ask, seek." Based on this derivation, valid meanings of competition would be "to aim at together," "to try to reach together," and "to strive after together."

Competition can come in many forms. The version of competition that economists typically invoke when discussing markets is not about wolves competing in a pen full of sheep; nor is it competition among weeds to choke a flowerbed. The market-based competition envisioned in economics is disciplined by rules and reputations, and those who break the rules through fraud, theft or other offenses are clearly outside the shared process of market competition.

Market-based competition is closer in spirit to the interaction among Olympic figure skaters, in which pressure from other competitors and from outside judges pushes individuals to seek innovations, to strive for doing the old and familiar in better ways. Sure, the figure skaters are trying their hardest to compete and win, but their process of competing under agreed-upon rules is a deeply cooperative and shared enterprise. In the 1994 U.S. Figure Skating Championships, when the ex-husband of skater Tonya Harding hired a thug to try to break the leg of another skater, Nancy Kerrigan, the attack was clearly outside the meaning of competition because it breached the cooperative essence behind how Olympic competition works.

Just as competition is not a shorthand for "anything goes," the quick and thoughtless inference that cooperation is necessarily virtuous is often unjustified. In many cases, cooperation is a tool for an in-group to take advantage of those outside the group. For example, if large companies cooperate to lobby national politicians for policies that impose costs on consumers and taxpayers as a way of adding to corporate profits and bailing them out for their mistakes, it is surely not an example of virtuous behavior. If firms cooperate in an attempt to raise the prices that they charge to consumers, it is illegal under the antitrust laws because it represents a failure to compete. Those who seek to discriminate based on race, gender and ethnicity often demonstrate a high degree of cooperation with others who share their views. Criminals often cooperate with each other by refusing to rat out other criminals. War often involves a conflict between societies that show high levels of internal cooperation.

In short, real-world examples of "cooperation" are often not as selfless as, say, volunteering to donate blood or anonymously sending cash to a charity. Instead, real-world cooperation is often enforced by a group of peers, using a combination of economic, legal and social incentives to reward those who act with the group and to impose costs on those outside the group. Those who are quick to believe that cooperation should be automatically equated with virtue should take a step back and consider both what each specific cooperative behavior is intended to achieve and how it is enforced among those within the group who might have preferred not to cooperate in a certain situation.

In contrast, competition within a market context actually happens as a series of genuinely cooperative decisions, every time a buyer and seller come together in a mutually agreed-upon and voluntarily made transaction. This idea of cooperation within the market is at the heart of what the philosopher Robert Nozick referred to in his 1974 work, *Anarchy, State, and Utopia*, as "capitalist acts between consenting adults."[1]

When Steve Jobs died in 2011, the media were full of glowing praise for how he had transformed the world of consumer electronics several times over, from the personal computer to the portable music player to the smartphone. But if you know anything about Steve Jobs as a person (and I recommend the eponymous 2011 biography by Walter Isaacson[2]), you know that Jobs was often driven, tactless and harsh—in many ways the opposite of what would conventionally be regarded as a cooperative personality. But the type of cooperation implicit within competition does not require that the competitors themselves be warm and friendly toward each other. Like many other hard-driving business leaders, Jobs competed like the market-sector equivalent of an Olympic skater, striving together with competitors from other firms in a rule-based process to win an innovation contest. Millions of people then demonstrated their desire to cooperate with Apple by purchasing the products that Jobs played a substantial role in designing and bringing to market.

Thinking about markets as a blend of competition and cooperation has become more or less standard in business schools. Back in 1996, for example, Adam M. Brandenburger and Barry J. Nalebuff wrote a prominent book called *Co-opetition*, which is, as it says on the cover, "a revolutionary mindset that combines competition and cooperation."[3] That word "revolutionary" contains a bit of puffery, but the book usefully points out many ways in which competition and cooperation are intertwined.

For example, many firms either have or hope to have ongoing relationships with their customers, and they benefit when customers offer them honest feedback and communication. Similarly, many firms rely on long-term relationships with suppliers, and they count on those suppliers to make long-term investments and to pursue innovations in a cooperative manner. If firms in a certain market were only competitors, then gains for one firm should always mean corresponding losses for the other. But if the competitors of a firm in a given market act in a way that makes the product appear unsafe or the industry appear irresponsible, then all firms in that industry may well suffer as a result. Conversely, if competitors in a market innovate in a way that opens up new market opportunities, almost all firms in that market can often find ways to benefit.

In short, competition and cooperation are not polar opposites. Competition refers to a situation in which people or organizations (such as firms) apply their efforts and talents toward a certain goal, and they receive results based substantially on their performance relative to each other. The true opposite of competition would be a situation in which those who strive to meet a certain goal experience outcomes that have little or nothing to do with their actual performance, as occurs when government overrides the process of competition by offering subsidies to loss-making firms.

Cooperation refers to a situation in which the participants seek out win-win outcomes from working together. Thus, the opposite of cooperation would be a situation in which such win-win outcomes are difficult or discouraged. For example, this could reflect a situation of lawlessness or a set of social norms in which people expect that cooperative agreements are likely to be broken—and, thus, the incentive to cooperate is low.

If both competition and cooperation are understood as voluntary choices (and, after all, "involuntary cooperation" is an oxymoron), then a fully planned economy would be the opposite of both competition and cooperation. When government dictates prices and quantities, a planned economy eliminates the incentives of market participants—whether suppliers, producers, or consumers—either to compete or to cooperate.

Those of us who self-identify as economists should not wear the terminology of "competition" as a badge of shame, while wistfully contemplating a presumed ideal of cooperation. For the study of economics, as in the real-world economy, the concepts and practices of competition and cooperation are inevitably interlocking.

Footnotes

1. Nozick, Robert. 1974. *Anarchy, State, Utopia*. Basic Books.

2. Isaacson, Walter. 2011. *Steve Jobs*. Simon and Schuster.

3. Brandenburger, Adam M., and Barry J. Nalebuff, 1996. *Co-opetition*. Currency Doubleday.