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# The Foundation of Market Quality Economics1

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**Abstract**

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This study shows that competitive fairness is achieved by several market mechanisms that I constructed in my previous work.

Keywords: market quality, fair prices, entire fairness test, M&A law, price competition

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# The Foundation of Market Quality Economics[1]

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**Abstract**

This study is based on my observation that high quality markets are indispensable for the healthy growth of a modern economy. Many problems surrounding markets are attributable to the lack of high quality markets. An industrial revolution creates extremely vibrant but unhealthy markets. This study introduces a concept of fairness in dealing and pricing (competitive fairness), which differs from efficiency, and define market quality as a measure for the efficiency of allocation and the fairness of dealing and pricing. This study shows that competitive fairness is achieved by several market mechanisms that I constructed in my previous work.

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# 1 Introduction

Recently, there has been much talk about the 21st century being the "Age of Quality." Looking back on the age of mass production and mass consumption that was the 20th century, the argument for quality seems persuasive. The last 30 years of improvements in product quality can be construed as a precursor to the true Age of Quality that is to come. However, it would be a mistake to think that the Age of Quality will appear automatically and all we have to do is wait for it.

In this study, I argue that a crucial prerequisite for the Age of Quality is the presence of high quality markets. A cursory review of history shows that an industrial revolution always creates an extremely vibrant economy but, at the same time, brings enormous social upheaval. The first industrial revolution, which had its origins in the invention of the steam engine, brought in its wake such deterioration in the working environment that it gave rise to Karl Marx and his theory of labor exploitation. The second industrial revolution was followed by the Great Depression, itself triggered by the U.S. stock market crash of 1929. Long-term unemployment and social instability spread rapidly to other countries, and the world was ultimately plunged into the turmoil of World War II. We can see a version of the same pattern arising from the more recent IT revolution. The U.S. economy enjoyed a period of unprecedented strength, but this was accompanied by widespread corporate scandals and recent subprime loan problems.

What caused these upheavals? I believe that they are attributable to economic and social systems surrounding markets (which may be called market organization) that were unable to keep pace with technology advances and

productivity gains brought about by the industrial revolution. As these experiences suggest, an Age of Quality will not necessarily flow naturally from an industrial revolution. The question is, what can be done to promote the emergence of aan Age of Quality? My answer is to create sound economic and social systems to support high quality markets while not undermining the productivity gains and economic vitality brought by the IT revolution.

This answer is based on the proposition that high quality markets are indispensable for the healthy growth of a modern economy. Obvious as it may appear, this is a new theory in the existing economic literature, which has never dealt with the questions what "market quality" is or what a "healthy economy" is.

The purpose of this study to provide a precise definition for market quality, thereby building a foundation for what may be called "market quality economics." Broadly speaking, "market quality" may be defined as the degree to which a market functions "properly." The various functions of a market can be combined into two fundamental functions. These are the allocation and the pricing of resources. A narrow definition of "market quality" can therefore be an index capturing how "properly" a market allocates and prices resources.

While modern economics is equipped with highly sophisticated normative measures for resource allocation such as Pareto optimality, it lacks a normative measure for pricing or, more broadly, "dealing," through which prices and other terms of trade are determined. This has prevented economics from properly handling such issues as "death from forced overwork" (*karo-shi*) and "oppression of subcontractors" (*shitauke-ijime*). While these terms reflect ac-

tual problems in the Japanese market, they cannot be properly addressed by means of efficiency only. In this study, with these considerations, I propose a concept of fairness as a normative measure for pricing and dealing.

Because markets cannot function without competition, and because competition cannot take place without rules, I define fairness in dealing relative to a set of rules in a market. I say that actions in a market are competitively fair if they are conducted in full compliance with the set of rules "generally" accepted for that market. The state of a market is competitively fair if it is formed through competitively fair actions and if there are no profit opportunities left available for competitively fair actions. Competitively fair prices are not identical with efficient prices. I will demonstrate this fact by using my price competition model with free entry (see Yano, 2005a and 2006).

It is important to note that fairness is defined with respect to a set of "generally accepted rules," although this definition is incomplete without spelling out what "generally accepted" means. It is undesirable to define a fair action as an action that is made in compliance with an unfair rule because, under this definition, an action made in compliance with an unfair rule must be thought of as fair. Such a pathological case can be avoided by defining fairness with respect to a set of "generally accepted rules."

In order to determine whether or not a particular rule is fair, it is necessary to have a higher-level rule with respect to which that particular rule can be evaluated. In order to determine the fairness of that higher-level rule, it is necessary to have an even higher-level rule. This inductive relationship between rules and fairness could continue endlessly.

In defining competitive fairness, I assume that this inductive process ends

with the very basic fairness defined with respect to a fictitious market that is endowed with the most fundamental features of markets and on which the most fundamental rules are imposed. I call this fictitious market the Base Market and define fundamental competitive fairness as competitive fairness with respect to those fundamental rules in the Base Market. "Generally accepted rules," defining competitive fairness for other markets, can be interpreted as a set of rules defined by backward induction from fundamental competitive fairness. As a mathematical description of fundamentally competitively fair transactions, I explain the open market bargaining equilibrium that I have developed in my recent paper (Yano, 2008a) and relate this equilibrium to the entire fairness test used to evaluatate the actions of corporate directors and officials having fiduciary duties under U.S. M&A law.

Although market quality is a new concept that I proposed only a few years ago (Yano, 2001, 2005b, 2008b), it has been perceived by a number of influential Japanese economists as providing an important viewpoint to understand the present state of the Japanese economy. Some economists argue that in order for the Japanese economy to recover from the long stagnation period since the 1990s, it is crucial to develop high quality capital and labor markets. Ikeo (2008) analyzes the Japanese capital market and focuses on the importance of building a high quality capital market. Higuchi (2005a, 2005b) and Higuchi and Yamakawa (2008) analyze the Japanese labor market and regulations from the viewpoint of quality. Higuchi (2008) and Miyoshi (2007) conduct empirical research on the quality of the Japanese labor market from the viewpoint of female labor market participation. Kurokawa (2008) relates capital market quality to the quality of the accounting system. Hosoda

(2008) discusses the building of a market for bads from the viewpoint of market quality. Panel data focusing on the quality of the Japanese labor market have been constructed since 2005; see Higuchi, Kimura, and Naoi (2008) on the scope of that data set.[1]

As these studies show, market quality provides a useful perspective on the working of the present Japanese economy. At the same time, it provides a useful tool for characterizing a well-functioning market. As such an example, I will demonstrate that the entire fairness test under U.S. M&A law can be interpreted in relation to the fundamental competitive fairness in the Base Market.

In what follows, in Section 2, I will briefly examine the history of market quality improvement so as to establish the validity of the theory that high quality markets are indispensable for the healthy growth of a modern economy. In Section 3, I will define market quality and then explain the need for dynamic approach to study issues related to market quality. In Section 4, I will show that competitive fairness is conceptually different from efficiency. In Section 5, which is concerned with the Base Market, I will characterize a fundamentally competitively fair state by means of open market bargaining theory. Section 6 is for concluding remarks.

[1] Although the data gathering was started only in 2005, its use has already been acknowledged internationally, as is evidenced by Naoi, Sumita, and Seko (2007), which was awarded the *Journal of Property Research* Paper Prize, Best Paper in Real Estate Economics, from European Real Estate Society, 2007.

# 2 Market Quality Theory

Market quality is a new concept. However, we can intuitively grasp that there are "good markets" and "bad markets." A market in which the other party overcharges or coerces you to buy things you don't need can hardly be considered good. Likewise, we would probably not consider good a market in which only poor-quality merchandise is available.

History supports the proposition that high quality markets are indispensable for the healthy growth of a modern economy. In this section, we back up this proposition, which I call market quality theory, by examining the history of markets since the first industrial revolution.

## 2.1 Market Quality

Quality is an abstract concept. Therefore, it is important to start with an intuitive explanation of market quality; a precise definition will be given in Section 3.

What is a good market? For a trained economist, the answer to this question might be, "a good market is a market that establishes an efficient allocation." This answer, however, would not fit exactly the intuition of non-economists.

For a non-economist, a more intuitive answer would be, "A good market is a market in which you can buy better products for less." And if you are a consumer, that is the right answer.[2] Indeed, I believe, no other answer

[2] Although this proposition may look obvious, it contains a fundamental insight for characterizing market quality. Fumio Dei (1999) led me to notice the importance of the proposition, which I called Dei's lemma (see Yano, 2001).

expresses the nature of a good market so accurately. If you are a consumer.

I make this distinction because sellers obviously want to sell their goods for the highest price possible. In other words, from the seller's point of view, a good market is a "market in which you can sell better products for more." No seller wants to find himself in a market where people take advantage of his weaknesses to drive the price down. Markets determine prices by balancing the needs and desires of buyers and sellers. The prices that are determined through this balance can be considered "appropriate prices." Balancing the desire of the buyer to purchase cheaply and the desire of the seller to sell dearly, we can define a "good market" as one where you can "trade better products at a more appropriate price."

As this discussion shows, efficiency of allocation and pricing are key factors that determine market quality. In this study, I define market quality as a measure of "efficiency in allocation" and "fairness in pricing" in a market. "Fairness in pricing" may be restated as fairness in dealing or in the process in which the terms of trade are formed. A price formed through fair dealing is a fair price.

## 2.2 Determinants of Market Quality

As is discussed above, market quality could not be high if markets were characterized by coercive sales, fraud, and shoddy goods, which may be thought of as reflections of three primary factors that determine market quality. Those primary factors are, "quality of competition," "quality of information," and "quality of products."

By "coercive sales" I am referring to situations in which the seller has

significant and unilateral power (for instance, the power to use violence) enabling it to unilaterally set the terms and force the transaction. Transactions can be forced only when the seller does not have any competitors and buyers perceive that they have no choice but to purchase the good from the seller if they want to purchase it at all. In other words, the exclusion of competition is a prerequisite to coercive sales. Once we posit that a market rife with coercive sales is lacking in quality, it is easy to conceive that market quality can be increased by improving the quality of competition.

"Fraud," on the other hand, refers to a situation where one party to the transaction uses false information to obtain profits. It would be hard to consider a market that is overrun with false information a high quality market. Here again, better quality of information improves overall market quality.

Everyone knows "shoddy merchandise" when they see it. So it should be fairly easy to understand its relevance to quality of products. This paper interprets the term "quality of products" much more broadly to include the levels of technology incorporated into products and the diversity of the products themselves. Even if the products remain essentially the same, the overall quality of transactions is increased if products are produced more cheaply or in greater variety. Quality of competition, quality of information and quality of products are the decisive factors in market quality.

There are at least two other factors that are also important in determining the quality of markets: the quality of the decision-making by market participants and the quality of their economic activities. A market comprising people able to make dispassionate decisions is obviously of higher quality

than a market of non-dispassionate, indiscriminate players.

## 2.3 Triple-C Dynamics of Market Quality

Past industrial revolutions resulted in significant declines in market quality, at least temporarily. At the risk of oversimplification, I would argue that, since the 18th century and continuing through the present, market quality has moved along the three C-shaped curves illustrated in Figure 1 from the very bottom of the lowest curve upwards. Currently we are at the middle of the highest C-shaped curve.

In this figure, quality of competition and information is measured along the horizontal axis. Along the vertical axis, the quality of products is measured. Quality of competition and information and that of products are both endogenous variables, determined in a market by an equilibrium system. The triple-C diagram must, therefore, be thought of as a phase diagram, which traces a time path of the two-dimensional vector, representing quality of competition and information and that of products.[3]

The idea that market quality dynamics has moved from the bottom to upwards along the triple-C curve reflects the view that the fundamental technology of the economy has consistently improved over time. As is noted above, the quality of products is defined broadly to reflect the technologies embodied in products.

The world has experienced three periods of intensive technological ad-

[3] Yano and Furukawa (2008) build a dynamic model in which the triple-C dynamics of market quality can be captured as an endogenous phenomenon, resulting in nonlinear industrial revolution cycles.

vance in the past. Each has brought such significant changes to the overall structure of the economy that the term "industrial revolution" is fitting. The first begun with the invention in 18th century England of the steam engine, a development that triggered the first industrial revolution. The second occurred from the end of the 19th century to the beginning of the 20th century, when gasoline engines and electricity came into practical use, particularly in Europe and the United States. It was this development that supported the second industrial revolution. The third industrial revolution was supported by the development of computers and information technology, led by the U.S.

Technological progress ordinarily occurs gradually. However, in an industrial revolution technological progress is extremely fast. By contrast, market quality may be assumed to change relatively slowly. For this reason, it may be safe to describe dynamics in an industrial revolution period by an (almost) vertical upward shift. The three disconnects in the diagram correspond, from bottom to top, to the first, second and third industrial revolutions.

History indicates that industrial revolutions are always followed within a few decade by significant declines in market quality. Market quality is determined by the three elements of quality of competition, quality of information and quality of products. If quality of products is assumed to be (almost) constantly improving, the decline in market quality must reflect declines in the quality of competition and that of information, which are presented by an upward movement along the bottom of a C-curve.

As touched on earlier, the decline in market quality after the first industrial revolution is symbolized by the "exploitation" of the worker as argued by Marx. The purpose of this paper is not to investigate Marx's theory of

exploitation. At least theoretically, however, extremely strong monopolistic power on the employer side in employer-employee transactions may make it possible to hire people for far less than normal wages. It is by no means clear that the exploitation postulated by Marx actually existed in the labor markets of industrial-revolution England. But in 17th and 18th century America, for example, employers did have strong monopolistic power in the form of indentured service contracts that led to the employment of immigrants from Europe under extremely disadvantageous conditions. The concavity of the bottom-most C curve represents the formation of this kind of monopolistic power and the consequent decline in the quality of competition.

The decline in market quality that occurred after the second industrial revolution is symbolized by the Great Depression triggered by the collapse of US stock prices in 1929. In the aftermath of the crash, a large number of American companies declared bankruptcy, government monetary policy failed and labor markets were stretched beyond their ability to adjust. The result was massive unemployment and the spiral into the Great Depression. John Maynard Keynes (1883-1946) argued that the true cause of the Great Depression was the weakness of the self-correcting mechanisms of the markets and advocated the government creation of effective demand in order to spur recovery. This developed into the well-known "Keynesian economics," a school of thought that is still very influential today. If we can assume that quality of competition and information is determined by the "self-correcting mechanisms of the market," Keynes' definition of the problem can be considered to reflect the decline in market quality during the Great Depression.

The period of the IT revolution, which is the third industrial revolution,

generated an extraordinary number of corporate scandals. These scandals had a wide range of manifestations—accounting malfeasance, window dressing, insider stock trading—but all reflected a decline in the quality of the information disclosed by companies.

## 2.4 Rulemakings for Markets in the 20th Century

From the viewpoint of market quality economics, the 20th century may be thought of as an age of rulemaking for markets. Various rules on markets were developed throughout the century, in which markets came to play a much more important role than before. During this period, people tried to formulate rules that would protect markets by ensuring both the quality of competition and the quality of information. These rules seem to have played a significant role in the latter half of the century in halting the decline in market quality after the second industrial revolution and aiding its rebound.

By "protecting markets" I do not mean protecting domestic markets from foreign goods. Rather, market protection refers to the creation of rules that enable markets to function fully and environments that allow market functions to improve. To put it a different way, "market protection" in this context means "fostering the essential and desirable functions of markets."

The creation of market-protecting rules was a process that occupied the entire 20th century, responding to problems in markets as they arose. The process actually began even earlier. It is well known, for example, that 19th century England formulated the basic rules governing labor unions.

Towards the end of the 19th century, the United States was in the midst of the Second Industrial Revolution, with the Rockefeller Trust and similar

entities wielding extraordinarily strong monopolistic powers. The damages from the situation were beginning to become apparent, and in 1890 the Sherman Act was passed, marking the beginning of competition rule-making. In fact, the Sherman Act provided the foundation upon which a body of competition law known as "antitrust law" was created in a process that extended throughout the 20th century.

When the Great Depression hit in 1929, the crisis was clearly pinned on the chaotic and disorderly securities markets of the 1920s. This paved the way for a growing recognition of the importance of transparent information in securities trading, leading to the formulation of a number of significant laws in 1933 and 1934, among them the Glass-Steagall Act that separated banking and securities and the Securities Act and Securities and Exchange Act that formulate the basic rules for securities trading. These laws are considered to have made significant contributions to the development of US capital markets.

In the United States, the "business judgment rule" defines the relationship between a company's management and shareholders. The basic principle underlying this rule is that shareholders have entrusted management of the company to the managers and therefore must demonstrate that the managers have failed to act in good gaith and with due care (bearing the "burden of proof") if they wish to take managers to court for bad decisions. That was fine until the 1980s and 90s when the M&A boom raised issues that were beyond the scope envisioned by the business judgment rule. As a result, exceptions to the business judgment rule were created for M&A. This will be discussed in detail in Section 5.

After the heyday of the Third Industrial Revolution or IT Revolution, America experienced a spate of scandals involving firms such as Enron and WorldCom. The cause of the scandals is said to have been a decline in corporate ethics brought about by rapid economic growth, and the cure was deemed to be a new system of corporate governance in which companies are held accountable for the transparency of the information they publish and for the activities in which they engage. To create this governance system, the United States passed the Sarbanes-Oxley Act in 2002, and the impact of this law has been carefully monitored around the world.

# 3 Market Quality and Dynamic Approach

Market quality as a research theme is concerned with the dynamic process in which a better market is formed over time. In the conventional economics, real-world markets have often been analyzed in comparison with the model of perfect competition, which possesses the ideal properties of a market. In many cases, however, it is impossible to transform an imperfectly competitive real-world market into a perfectly competitive market. It is therefore more useful, and practical, to look for a way in which a market may be improved even slightly over time, the process with which "market quality economics" is concerned. Before discussing these issues, it is necessary to introduce a more precise definition of market quality.

## 3.1 Competitive Fairness in Market Quality

As discussed above, I define market quality as a measure of "efficiency in allocation" and "fairness in dealing." While efficiency is a standard concept in economics, fairness in dealing is not. In order to develop a meaningful definition of market quality, therefore, it is necessary to explain what fairness in dealing means.

In the previous subsection, I argued that fairness must be treated as equally crucial a criterion as efficiency in evaluating the performance of a market. This is not at all surprising because a market is based on competition and because competition cannot be separated from fairness. This fact is clearly shown even in a standard dictionary. In *Webster's Third New International Dictionary*, for example, "fair," as in "fair trading," is defined as "conforming to an established commonly accepted code or rules of a *game or other competitive activity*" (italics added).

As this definition suggests, a concept of fairness to characterize fair dealing and fair prices needs to be defined relative to a set of rules governing a market (market rules). Following *Webster*'s definition, I say that actions in a particular market are competitively fair if they are conducted in compliance with the set of "generally accepted" rules. Moreover, a state of that market is competitively fair if it is formed through competitively fair actions and if there are no profit opportunities left available for competitively fair actions.

Rigorously speaking, this definition would be incomplete if what "generally accepted" means were not spelled out. For the moment, however, I stay with the above definition and will return to a more rigorous definition in Section 5.

In the definition of competitive fairness, a profit opportunity is defined broadly, covering opportunities not only to gain the standard sense of a profit, or a producer surplus, but also to acquire an additional utility (or a consumer surplus). Defined this way, the profit opportunities are always finite due to the boundedness of feasible economic activities. Every market participant can be assumed to compete to acquire as large a share as possible of that total profit opportunity (individual optimizations). A competitively fair state is a state that is reached after such profit opportunities are fully pursued by means of actions that are permitted under the set of rules generally accepted in the market.

Twentieth century economists have more or less stayed away from the concept of a fair price. Fairness in market transactions has been treated like the "ugly duckling" in the beautifully developed pond of mathematical concepts for efficiency, such as social surplus, Pareto optimality, and social utility. This has made it extremely difficult to tackle certain economic phenomena such as "unfair market advantage," "unjustifiably high prices," "exploitation of child laborers," "death from overwork" (or, more precisely, forced overwork), and "exploitation of advantageous positions."[4] The concept of market quality, built on not only efficiency but also fair dealing, is intended to provide a formal theoretical passage to tackle these issues.

Although what a fair price is has been outside of the scope of twentieth

[4]Death from overwork ("*karoshi*") refers to the Japanese social phenomenon that a number of workers have died of overwork they were unable to refuse due to social and institutional pressures. Abuse of advantageous positions ("*yuetsuteki chi-i no ranyo*") is a type of actions that are prohibited under the Japanese anti-monopoly law; this concept does not exist in the U.S. anti-trust law (see Murakami and Yano, 2007).

century economics, the importance of building a normative standard for a price was clearly recognized in pre-twentieth century economics. For such a standard, Adam Smith (1776) discussed the concept of a "natural price." Alfred Marshall (1890) followed it and proposed a "normal price," which he treated as the neo-classical version of Smith's natural price. While a normal price appears to be defined almost synonymously to an efficient price, my concept of a fair price is not identical to that concept, as is shown in Section 5.

## 3.2 What is a Market?

It is useful at this stage to discuss what a market really is. Modern economies are founded on the voluntary economic activities of their members. Everyone is guaranteed the freedom to engage in economic activities based on their own free will as long as they adhere to certain basic rules. Markets are fora for exchanging the results of these free economic activities. Common practice, however, does not term any forum for free exchange a "market." For example, a child may receive money from his or her parents in a free exchange, but we do not call this a "market." Then, what separates markets from simple fora for voluntary exchange?

I define "market" as a forum for voluntary exchange that guarantees the opportunity to engage in a transaction with a separate third party in the event that you wish to forgo a pending transaction with somebody else. The reason why exchanges of money between parents and children are not "market exchanges" is because there is a specific counterparty and no room for a third party to enter the transaction.

In a standard introductory textbook, a market is explained as a place for voluntary exchanges in which a single product can be traded at a constant unit price; in economics, a price is often used as a synonym for a unit price. A typical example can be found in a supermarket; in a supermarket, each product is sold at one single unit price, which is almost always non-negotiable. In this study, I call such a market a unit-price market; textbook style monopolistic, oligopolistic, monopolistically competitive, and perfectly competitive markets all fall in this category.

Looking at markets for consumables, one might think that every market is a unit-price market, but it is incorrect.

In the real economy, unit prices are often largely malleable; in many markets common practice is to set a specific price for transactions in a specific lot size. For those who are involved in actual production activities, it will probably not be necessary to be reminded of this fact; most of the transactions between companies are for products that do not have established unit prices (or if they are established, they are not applied rigidly in actual practice). I will call markets such as this, in which the terms of the transaction are determined in negotiations between the parties, face-to-face transaction markets.

If various types of markets are lined up, from the left to the right, in the order of market power that individual market participants may have, they form a sort of spectrum, which is shown in Figure 2. Market participants have clearly stronger market power in pricing in a face-to-face transaction market than in a unit-price market. Therefore, I may put unit-price markets to the right of face-to-face transaction markets. The perfectly competitive

market lies at the right-hand side end of the spectrum. The monopolistic market lies at the other end of the unit-price market segment. Monopolistically competitive markets and oligopolistic markets are situated in between. Various face-to-face transaction markets are distributed over the left-hand half of the spectrum. The forum for voluntary exchange in which nobody other those directly involved in the exchange participates (isolated voluntary exchange) is at the end of the left-hand side.

It is safe to assume that the farther towards the right a market is situated along the spectrum, the higher the quality of that market, because the market power that individual market participants have in a market reflects the degree of competition in that market. In the real world economy, both face-to-face transaction markets and unit-price markets usually form naturally. As an economy progresses, many face-to-face markets have transformed themselves into unit-price markets.

An improvement of market quality does not always imply a rightward shift of a market along the spectrum. Even if two markets are situated at the same point on the spectrum, they may have different quality levels, which depends on the relative negotiation power among participants and the way in which negotiations on the terms of transactions are made. For example, consider two places for isolated voluntary exchange; one that involves parties who are totally emotional in the negotiation on the terms of transaction, and another that involves parties who can engage in rational negotiation. While both of these two places can be assumed to be situated at the end of the left-hand side of the spectrum, the latter is clearly of higher quality.

## 3.3 Market Infrastructure and Dynamics

In Section 2, I have pointed out that various laws and legal systems have contributed to the improvement of market quality over the 20th century. There are, however, many other factors that support market quality. I call the body of those factors a "market infrastructure." Of the factors constituting a "market infrastructure," moreover, I call the rules and laws on market the "primary infrastructure" and distinguish it from the rest, which I call the "secondary infrastructure."

As is discussed above, a market is a forum for voluntary exchange. It is, therefore, absolutely impossible to force a market to improve its quality by the application of direct outside power such as governmental regulations, which inevitably distorts voluntary economic activities. If economic activities are distorted, a high quality market cannot be created. If it is difficult to improve market quality by means of a direct application of outside power, it is possible to do so by forming an environment in which market quality improves by itself. As is discussed in Section 2, properly designed laws do the job.

It is not at all surprising that market quality has improved as laws on markets develop. This is because markets are based on competition and because competition can be conducted only under a set of rules. Just like fairness, competition is closely related to rules. This fact is also shown in a dictionary definition of the word. In *Webster*, "competition" is defined as "the act or action of seeking to gain what another is seeking to gain at the same time and [usually] under or as if under fair or equitable rules and circumstances." As this shows, competition cannot occur without a properly

designed set of rules. From this viewpoint, it may be right to say that markets in the 20th century are of higher quality than those in the 19th century, in which rules on markets were less developed.

Rules and laws are the primary factor that determines market quality. Even if, however, two markets are subject to identical rules and laws, market quality can differ between those markets.

The quality of a particular market depends not only on rules and laws but also the number of market participants, their preferences, and the production technology with which the good dealt in that market is produced. This is evidenced by the fact that even in the U.S., which is equipped with a highly developed system of antitrust laws, both highly competitive and much less competitive markets exist.

Even if the same rules and laws are present, markets with different quality levels will be formed if those markets differ in the ways in which the rules and laws are enforced by the government and observed and complied with by market participants. For example, right after the World War II, Japan adopted competition laws and securities laws that are very similar to those of the U.S. However, they have been enforced much more loosely than in the U.S. This has clearly hampered Japanese ability to form high quality markets comparable to those in the U.S. The extent to which rules and laws are observed depends on people's consciousness and awareness and the social system through which they are enforced. More broadly, these factors depend on the ethics, culture, and history surrounding the society. All these factors constitute the secondary infrastructure.

The secondary infrastructure may be thought of as a filter through which

the primary infrastructure (*i.e.*, a set of rules and laws on market) are projected on a set of markets. The primary infrastructure can be viewed as a "light source." Light goes through the filter (the secondary infrastructure) and reaches the "market quality space," *i.e.*, the space spanned by efficiency in resource allocation and fairness in dealing, which determine market quality.

In Figure 3, the filter of the secondary infrastructure is illustrated in the middle. The primary infrastructure (a set of rules and laws on markets) as a light source is illustrated on the left-hand side. The set of markets that can be formed under this set of rules and laws is illustrated by the grey region in the market quality space on the right-hand side.

This figure shows that there are two ways in which the quality of a real world market may be improved. The first is to improve the applicable rules and laws (the primary market infrastructure). In this way, the entire grey region in Figure 3, indicating the set of markets with different quality levels resulting from that rules and laws, shifts to the northeast in the market quality space.

The second way in which market quality may be improved is that an existing set of rules and laws is more directly enforced by the government and complied with by market participants, provided that set of rules and laws are useful for a market. In other words, the more transparent the filter through which the light from the set of rules and laws passes, the higher the quality of the existing market becomes.

# 4 Competitive Fairness and Efficiency

Competitive fairness is not the same as efficiency. In order to demonstrate this fact, the recent work of Yano (2005a, 2006) is useful. In that work, I have demonstrated that in a market with free entry, Bertrand-like price competition establishes an equilibrium that is, in general, not efficient but may be thought of as competitively fair.[5]

Yano (2005a, 2006) establishes this result by using the idea of a rationed demand that Edgeworth (1897) developed in his criticism against Bertrand (1883).[6] In order to explain my results, it is useful to start with Edgeworth's criticism.

## 4.1 Edgeworth's Bertrand Criticism

Edgeworth's criticism is based on the short-run case, in which the number of firms in the market is fixed. For the moment, think of the case in which a kinked average cost curve like curve $E$ in Figure 4 (this is the case on which Edgeworth based his criticism). Let $p_L$ be the lowest possible average cost, which is at the level of the horizontal part of curve $E$ and $R$ be the level of the vertical part of $E$. Assume $R < D(p_L) \leq 2R$.

Now, think of a state in which two firms in total sell $D(p_L)$ units at the

[5] How firms enter into an origopolistic market is a highly important issue that has not yet fully been studied in the existing literature. Recently, however, the number of studies that are concerned with this issue has rapidly been increasing. For such studies, see also Yano and Dei (2006a, 2006b), Creane (2007), Dos Santos Ferreira and Dufourt (2007), and Bacciega, Gabszewicz, and Tarola (2007).

[6] For a recent study on price competition, see also Yano and Komatsubara (2006).

unit price of $p_L$. Edgeworth's argument is that this is not an equilibrium even though the demand meets the supply. This is because, according to him, if one firm raises its price above $p_L$, the other firm cannot increase its output more that $R$. If this firm sells $R$ units at $p_L$, there will be a gap between the demand existing at price $p_L$ and the quantity sold as much as $D(p_L) - R$. In order to fill this gap, therefore, buyers should be willing to pay a higher price. Denote as $d(p; p_L, R)$ this "rationed demand function" for $p \geq p_L$. It is then reasonable to assume that this rationed demand function satisfies

$$d(p_L; p_L, R) = D(p_L) - R; \tag{1}$$

this implies that if the higher price on the market, $p$, were equal to the lower price $p_L$, the rationed demand, $d(p; p_L, R)$, and the ration, $R$, would add up to the unrationed demand at the lower price, $p_L$, $D(p_L)$. This rationed demand curve may be illustrated by the dotted curve, $d$, in Figure 4. In what follows, I assume that both unrationed and rationed demand curves are downward sloping in the interior of the quantity-price space. As is illustrated in Figure 4, the rationed demand curve can intersect the vertical axis, which is the case in the Cournot model.[7]

Because the number of firms is fixed, each firm would know that if it were to raise its price from $p_L$ (and if it believes that the other would firm sticks to price $p_L$), it could sell to this rationed demand curve at a price above the average cost, thereby making a positive profit; in Figure 4, if a firm raises its price to $p$, it can sell $y$ units. This implies that the state in which both firms sell at their lowest price $p_L$ cannot be in equilibrium.

[7] See Yano (2006) for a precise modelling of the rationed demand function adopted here.

## 4.2 Yano's Dual Price Equilibria

One case that is free from Edgeworth's criticism is the case of the horizontal average cost curve, on which Bertrand's original argument was based. In that case, the supply is perfectly elastic so that if one firm were to raise its price above the lowest possible price, the other firms can absorb the entire demand at the lowest price. In fear of losing its customers this way, no firm dares to raise its price, resulting in the standard Bertrand equilibrium.

In modern economics, the perfectly elastic supply curve may be thought of as a description of a long-run state of a market in which free entry and exit are guaranteed (McKenzie, 1959, Jones, 1965, and Yano, 1984). Yano (2005a, 2006) interprets Bertrand's argument in that context. Although contestable market theory is based on a similar interpretation (Baumol, Panzar, and Willig, 1982), it is not built on a game theoretical framework. The theory is also subject to the so-called non-integer problem, i.e., the problem that no equilibrium exists in the case in which the market demand is not exactly equal to the supply that the firms are willing to make at the price equal to the minimum average cost.

Yano (2005a, 2006) introduces a game theoretical framework by incorporating Edgeworth's rationed demand and resolves the non-integer problem. That is, under free entry, as is shown below, price competition results in either a dual price equilibrium in which a homogenous product is sold at more than one price or a single price equilibrium in which the market demand is not completely absorbed by the supply. Without the non-integer problem, a contestable market equilibrium is supported in Yano's game as well.

For the sake of explanation, let $c(y)$ be the total cost function and $D(p)$

be the demand function. Assume that the average cost curve, $AC = c(y)/y$ has a standard U-shaped, shown by curve $AC$ in Figure 5. As above, denote as $p_L$ the lowest possible average cost,

$$p_L = \min_y c(y)/y = c(y_L)/y_L; \tag{2}$$

$y_L$ is the output achieving the minimum average cost. Denote as $n_R$ the maximum number of firms that can supply $y_L$ at $p_L$, i.e.,

$$n_R = \arg\max_n \{ny_L : ny_L \leq D(p_L)\}. \tag{3}$$

It is said that the non-integer problem exists if firms cannot completely satisfy the market demand at $p_L$ (i.e., if $n_R y_L \neq D(p_L)$). Assume in addition to (1) that without the non-integer problem, the rationed demand does not exist, i.e., that

$$d(p, p_L; n_R y_L) = 0 \text{ for all } p \geq p_L \text{ if } n_R y_L = D(p_L). \tag{4}$$

Define $p_R$ and $y_R$ at the intersection between the average cost curve, $AC$, and the rationed demand curve, $d$, i.e.,

$$d(p_R; p_L, n_R y_L) = y_R \text{ and } p_R y_R = c(y_R). \tag{5}$$

In Figure 5, $n_R = 2$ and $R = 2y_L$. In this figure, think of a state in which two firms each sell $y_L$ units at $p_L$ and in which one firm sells $y_R$ units at $p_R$. If free entry is guaranteed in the market, no incumbent firm has any incentive to raise its price. This is because the incumbent can expect that as soon as it raises its price, it will lose its customers to a new firm, which will enter the market and takes up the position that the incumbent currently enjoys. Moreover, no potential entrant has any incentive to enter the market; in order

to enter the market, a new entrant must undercut the existing prices. This implies that if it is to service a non-rationed demand, it must set its price below $p_L$ and that if it is to service the rationed demand, it must set its price below $p_R$. Those prices are below average costs, which gives no incentive to a new firm to enter the market.

The above discussion assumes that the rationed demand curve, $d$, intersects the average cost curve, $AC$. However, the rationed demand curve may lie below the average cost curve in the interior of the quantity-price space. In this case, $y_R = 0$, and $p_R$ is at the vertical intercept of the $AC$ curve, as is shown in Figure 6.

In this case, price competition leads to the equilibrium in which $n_R$ firms sell $n_R y_L$ units in total at $p_L$, and the rationed demand is left unserviced; i.e., an excess demand remains on the market. This may be explained as follows: In this state, there is no incentive for a potential entrant to enter the market; if it were to enter the market, it would have to sell at a price below $p_L$ so as to take away customers of the incumbent firms. Similarly, there is no incentive for an incumbent raise its price above $p_L$, in which case a new firm would enter the market and take away all the customers of that incumbent. For an incumbent, there is no incentive to reduce the price from $p_L$ either. Thus, the state illustrated in Figure 6 is in equilibrium.

Figures 5 and 6 are concerned with the case in which $n_R > 0$. If, as is shown in Figure 7, the market demand curve, $D$, intersects the downward sloping part of the average cost curve, $AC$, it holds that $n_R = 0$. In this case, in which the unrationed demand is too small for any firm to sell at price $p_L$,

treat the unrationed demand curve as the rationed demand curve, i.e., that

$$d(p, p_L; n_R y_L) = D(p) \text{ for all } p \geq p_L \text{ if } n_R = 0. \tag{6}$$

Then, $(y_R, p_R)$ is determined at the intersection between curves $D$ and $AC$. For the same reasons as above, price competition leads to the equilibrium in which only one firm sells $y_R$ units at $p_R$.

These results are summarized as follows:

**Theorem 1 (Yano, 2006)** *Let $y_L > 0$. Generically price competition in a market with free entry leads to one of the following three types of equilibria:*
***Case*** 1 : *If $0 < n_R y_L < D(p_L)$ and $y_R > 0$, then a dual-price equilibrium holds in which $n_R$ firms altogether sell $n_R y_L$ units at $p_L$ and in which one firm sells $y_R$ units at price $p_R$.*
***Case*** 2 : *If $0 < n_R y_L < D(p_L)$ and $y_R = 0$, then a single-price equilibrium holds in which $n_R$ firms altogether sell $n_R y_L$ units at $p_L$ and in which $D(p_L) - n_R y_L$ units of the demand at $p_L$ remains unsatisfied.*
***Case*** 3 : *If $n_R = 0$, then a single price equilibrium holds in which only one firm sells $D(p_R)$ units at price $p_R$.*

As the theorem shows, even if the non-integer problem is present, i.e., even if $0 < n_R y_R < D(p_L)$, a price competitive equilibrium exists in a market with free entry. Case 3, in which no firm is willing to supply at price $p_L$, may be thought of as a game theoretic representation of a natural monopoly equilibrium of Demsetz (1968). Generically the above theorem characterizes all the possible equilibria that can be established by price competition in a free entry market with Edgeworth's rationed demand function. The one case

that is not described above is the case free from the non-integer problem, i.e., $n_R y_L = D(p_L)$, which occurs with zero probability. In this case, it has been demonstrated that the same equilibrium as that obtained under contestable market theory holds in Yano's model as well. (See Yano, 2006, for a precise modelling and a derivation of the result.)

**Corollary 1 (Baumol-Panzar-Willig, 1982)** *If it happens to hold that $D(p_L) = n_R y_L$, a single price equilibrium holds in which $n_R$ firms sells $D(p_L)$ at price $p_L$.*

## 4.3 Coexistence of Large and Small Firms

A useful application of my price competition theory may be found in the case in which there are more than one technology and in which firms can freely choose one of those technologies when they enter the market. For the sake of explanation, think of the case in which there is another technology that is represented by the horizontal average cost curve $C$ in Figure 8. Let $c$ be the level of line $C$, and assume

$$p_L < c < p_R, \tag{7}$$

as is shown in Figure 8. Define $y_C$ as the output level at the intersection between line $C$ and the rationed demand curve, $d$, i.e.,

$$y_C = d(c; p_L, n_R y_L). \tag{8}$$

In that case, price competition results in an equilibrium in which two firms adopt the U-shaped average cost curve, $AC$, and each sells $y_L$ units at price $p_L$

and in which an indeterminate number of firms adopt the horizontal average cost curve, $C$, and sell the total amount of $y_C$ at price $c$.

This may be explained as follows: In order for a potential entrant to take away customers of an incumbent, it must either adopt the U-shaped average cost curve, $AC$, and sell products at a price below $p_L$ or adopt the horizontal average cost curve, $C$, and sell products at a price below $c$. In either way, a potential entrant makes a loss, which prevents it from entering the market. For the same reason, no incumbent has an incentive to switch its technology. If it were to do so, its customers would all be taken away by an entrant, which would choose the same technology as that which the first firm uses currently. Moreover, no incumbent has an incentive to raise its price without changing its technology; if it were to do so, the customers would again be taken away by an entrant. Nor does an incumbent have an incentive to reduce its price, which would set the price below the average cost.

This result may be summarized as follows (see Yano, 2005a, for a precise modelling and a derivation of the result).

**Theorem 2 (Yano, 2005b)** *Suppose that two technologies represented by average cost curves $AC$ and $C$ in Figure 8 are available and that $0 < n_R y_L < D(p_L)$ and $p_L < c < p_R$. Price competition under free entry leads to a dual price equilibrium in which $n_R$ firms sell $n_R y_L$ units at $p_L$ and in which many firms altogether sell $d(c; p_L, n_R y_L)$ units at price $c$.*

The equilibrium captured in this theorem provides a theoretical explanation for the dual structure in which large and small firms coexist in the

same market. For example, we often observe a retail market in which a small number of large stores and a large number of small firms coexist. In such a market, it is usually the case that large firms have a more efficient technology and sell products at a lower price. The above theorem shows that such a state of a market can be an equilibrium resulting price competition under free entry.

It is possible to explain the coexistence of large and small firms by the existence of consumers with heterogenous tastes. Some may like to shop at a large store while others may like small stores.

Theorem 2 attributes the coexistence not to a taste difference but to a technology difference. In economics, a taste difference is usually viewed as the last resort to explain an economic phenomenon. In that respect, price competition under free entry provides a useful alternative theory to explain the coexistence of large and small firms.

## 4.4 Competitive Fairness in Yano's Equilibrium

In Yano's price competition model, free entry and horizontal competition may be thought of as rules imposed on the market. In general, free entry is the most fundamental rule that should be observed in a market. To the extent to which freedom of entry is restricted, the market becomes less effective. If free entry is prohibited completely, it becomes a mere place for voluntary exchange. For this reason, in Section 3, I define "market" as a forum for voluntary exchange that guarantees the opportunity to engage in a transaction with a separate third party in the event that you wish to forgo a pending transaction with somebody else; free entry is what guarantees the

existence of such a third party.

Another important market rule requires price competition. Under U.S. antitrust law, for example, restraints horizontal price competition are perceived as *per se* illegal without any examination based on the rule of reason, the guiding principle for the application of antitrust laws requiring the economic examination of pros and cons of a particular conduct.

As these discussions show, free entry and price competition are generally accepted rules in most markets. Because the price competition equilibria described by Theorems 1 and 2 are formed in a market in which those rules are observed, they may be regarded as competitively fair. Those equilibria are, however, not efficient, because neither the presence of dual prices in a homogenous good market (in a dual price equilibrium) nor the existence of buyers who cannot satisfy their demand completely (in a single price equilibrium) is compatible with efficiency.

The above discussion may be summarized as follows:

**Proposition 1** *In a market with free entry, price competition leads to an equilibrium that is competitively fair but, in general, not efficient.*

My theory of price competition suggests that so long as free entry and price competition are maintained, a competitively fair state may be realized in a broad range of real-world markets. One good example may be the U.S. airline market. Since the deregulation in the 1970s, that market has been highly competitive. Over the last 30 years or so, the market has experienced several drastic changes. Many small companies started and went out of

business. Even large companies have experienced fundamental structural changes. Right now, many companies are in trouble due to the deteriorating economic conditions brought about by high oil prices and the subprime loan problem. The market reacts very quickly to such a change and forces many companies out of business. History tells that even big companies are no exception. At the same time, when the economy turns better, many new companies enter the market and drive down prices.

By judging from these fact, it appears safe to assume the U.S. airline industry has been operating in a zero-profit state in the long run. At the same time, it has been well known that the industry is subject to harsh price competition. The price is highly sensitive to economic conditions.

These facts exactly coincide with what is assumed in Yano's price competition model. Therefore, it may be concluded that the U.S. airline market may be described by an equilibrium described in Theorem 2, in which large and small firms coexist. In this sense, the market may be regarded as achieving a competitively fair state.

# 5 Fundamental Competitive Fairness

I define a competitively fair action as an action that is conducted in compliance with the set of generally accepted rules. Although this definition is incomplete without spelling out what "generally accepted" means, it is much more desirable than to define fairness with respect to an arbitrarily given set of rules. This is because if a fair action were defined as an action made in compliance with an arbitrary set of rules, an action that is carried out in

compliance with an unfair rule would have to be thought of as fair, which is undesirable.

In order to determine whether or not a particular rule is fair, it is necessary to have a higher-level rule with respect to which that particular rule can be evaluated. In order to determine the fairness of that higher-level rule, it is necessary to have an even higher-level rule. This inductive relationship between rules and fairness could continue endlessly.

In defining competitive fairness, I assume that this inductive process is not endless but ends with the very basic fairness defined with respect to the fictitious market that is endowed with the most fundamental features of markets and on which the most fundamental rules are imposed. I call this fictitious market the Base Market and say a competitively fair state of this market is fundamentally competitively fair.[8]

In this section, I will explain the Base Market and what I regard as the fundamental rules of this market. I will then relate these rules to the U.S. law on fiduciary duties with regard to corporate executives.

[8] Mathematically, this structure of defining fairness is similar to dynamic programming, in which the optimal plan is obtained by backward induction from the optimal policy at the end of the planning horizon. The Base Market may be compared with the end-of-the-planning-horizon problem (terminal problem); fundamental competitive fairness may be compared with the optimal program in the terminal problem. Competitive fairness in other markets may be defined by backward induction from that terminal problem. The definition of justice by Rawls (1971, 2001) may be thought of as having a similar structure.

## 5.1 The Base Market

I assume that the Base Market is a market that possesses only the very basic features that all markets share. It is a market like an old village market in a primitive economy. It is, however, not a barter transaction market but equipped with money as a medium of transaction. In the Base Market, every seller owns finite units of a commodity, and every buyer purchases only finite units. All market participants engage in price competition. They are on an equal footing in terms of market power and access to information. Anyone can participate in the market and exchange goods for money. Transaction costs are minimal or much lower than those that market participants would have to pay if they were to make a similar transaction outside of the Base Market.

The Base Market is subject to several fundamental rules that are imposed on all economic agents in a non-discriminatory manner. They are as follows:

**Rule 1** (property right): *Goods (and money) traded in the Base Market must be subject to transferable private ownership.*

**Rule 2** (voluntary exchanges): *Transactions in the Base Market must be voluntary.*

**Rule 3** (non-discriminatory treatment): *No one is allowed to discriminate between one agent and another on the opposite side of the market on any basis except the economic terms they offer.*

**Rule 4** (equal treatment under rules): *All agents, or all actual and potential market participants, are equally treated under the maret rules.*

I say that actions in the Base Market are fundamentally competitively fair if they are conducted in compliance with Rules 1 through 4. Moreover, a state of the Base Market is fundamentally competitively fair if it is formed through fundamentally competitively fair actions and if there are no profit opportunities left available for fundamentally competitively fair actions.

Except Rule 3, the above rules are more or less standard. In contrast, the third, the rule of non-discriminatory treatment, may need some explanation. This rule together with Rule 4 guarantees free entry. Under Rule 4, Rule 3 must be applied equally to all market participants, either actual or potential. Because Rule 3 implies that any particular person will not be discriminated against on the basis of any non-economic characteristic, he must be allowed to make a transaction so long as he can make an economically viable offer to an agent on the other side of the market. This implies that he has a right to freely enter the market.

While the nondiscriminatory treatment rule, Rule 3, is a familiar rule in the context of international economic relationships or, in particular, of GATT-WTO, it has not been emphasized in the literature on basic market theory. In the definition of the Base Market, the rule of non-discriminatory treatment is broader than in the context of international economic relationship. That is, by this rule, I mean that a seller or a buyer is not permitted to treat potential buyers and sellers, respectively, discriminatorily on any basis other than economic terms. This implies that if one market participant offers better terms than another market participant, that market participant's offer must be accepted regardless of the non-economic characteristics of the two market participants. The Robinson-Patman Act, prohibiting price discrim-

ination, is a similar rule, under which discrimination is defined much more narrowly.

Stipulating that no one is allowed to discriminate some potential market participants from others with whom he/she is to trade, Rule 3 (the rule of non-discriminatory treatment) may appear in conflict with the "standard" notion of fairness that supports a more favorable treatment for the weak than the strong. This is, however, not the case so long as the rule is imposed on the Base Market; because, in the Base Market, participants are assumed to be on an equal footing in terms of market power and access to information, non-discriminatory treatment is consistent with the standard notion of fairness.

In the real world economy, there are many markets in which the assumption of equal-footing participants is violated. In such a market, as is discussed in Sections 2 and 3, it is an important issue to design rules to mitigate problems arising from a disparity among participants in market power and/or access to information. Competition laws, proscribing abuse of market power, and security laws, dealing with an informational disparity among market participants, may be thought of as designed for such purposes. Designing rules to create a better market in the real world is a cental theme of market quality economics, which is however beyond the scope of this introductory study.

## 5.2 Open Market Bargaining Theory

In order to make a theoretical characterization for a fundamentally competitively fair state, it is necessary to build a model in which transactions are carried out in the Base Market. In my recent work, with this motivation, I

have introduced what I call open market bargaining theory (see Yano, 2008a).

In this theory, aspects of price competition and free entry are introduced into a bargaining process like that incorporated in core theory. An allocation is described by a collection of contracts, which I call a contract profile. Each contract is assumed to be a collection of what is called standing offers. A standing offer describes the way in which an agent desires to make his own transaction or, more precisely, the quantity that the agent desires to trade and the price that the agent desires to trade for that quantity. It is assumed that an agent can block (object to) a contract only by making a better price offer that improves the terms of trade of a standing offer belonging to the contract.

A central feature of open market bargaining theory lies in the way in which the fundamental rules on the Base Market are incorporated into a bargaining model. I guarantee the non-discriminatory treatment rule (Fundamental Rule 3) by assuming that any feasible contract profile can be formed from a given set of standing offers on the market (see Assumption 1). Moreover, the voluntary transaction rule (Fundamental Rule 2) is guaranteed by assuming that, in equilibrium, every contract is individually rational and "Pareto rational;" Pareto rationality refers to a contract profile that is not Pareto dominated by any other contract profile that can be formed from the standing offers behind that contract profile (see Assumption 2).

Open market bargaining theory is developed in order to describe the states of a market that are regarded as "fair" in several U.S. landmark cases on markets. In order to explain the basic idea, therefore, it is useful first to discuss one of those cases.

### 5.2.1 Fairness under U.S. M&A Law

Since the 1980s, the Delaware courts have developed several new standards applicable to decisions by corporate directors. Although the standards are developed with respect to M&A activities, they may be thought of as specifying the actions and considerations that directors need to take so as to fulfill their fiduciary duties to stockholders.[9]

These new standards depart from the traditional business judgment rule, under which "directors' decisions are presumed to have been made on an informed basis, in good faith and in the honest belief that the action taken was in the best interests of the company," and under which stockholders are required to bear the burden of proof in showing that directors have not met their duty of care or loyalty.[10] "The core of the duty of care may be characterized as the directors' obligation to act on an informed basis after due consideration of the relevant materials and appropriate deliberation, including the input of legal and financial experts."[11] The duty of loyalty refers to the obligation of directors to act solely in the interest of the company.

Since the 1980s, the Delaware courts have established several exceptions to the business judgment rule in the case of M&A transactions in which an apparent conflict of interests existed between the directors and stockholders. The first exception is called the *Unocal Standard*, which was developed in relation to directors' unilateral adoption of defensive measures against hostile

[9] See Yano and Komatsubara (2008) for a more detailed explanation.

[10] See Wachtell, Lipton, Rosen & Katz (WLRK hereafter, 2004), which provides a useful overview on the U.S. M&A law.

[11] See WLRK (2004).

takeovers.[12] The second exception is referred to as the *Revlon Test*, which is concerned with the decisions of directors in selling the company.[13] In these cases, the burden of proof is shifted from the stockholders to the directors.

A major concern of these rules appears to be what actions are fair in the relationship between directors and stockholders rather than how to achieve an efficient allocation. This is very clear in the entire fairness test, which has developed as the third exception to the business judgment rule.

The entire fairness test is concerned with the case in which the likelihood is high that directors may not fulfill the duty of loyalty; it was developed with respect to the case in which members of the board of directors of a company were promised bonuses upon the completion of the sale of the company and a major position in the company after the sale. In such a case, the test requires a judicial determination of whether a transaction is "entirely fair" to stockholders.

It is said that entire fairness refers to both fair dealing and fair price, which the directors are required to observe in selling their company. In the *Technicolor* Case, in which the entire fairness test was first developed, the court considered the facts (1) that in selling Technicolor, its directors sought the highest price that the buyer would pay, (2) that they were experienced and knowledgeable, (3) that they were advised by leading investment banking and legal firms, (4) that the actual price was about 100 percent more than the unaffected market price and the premium was higher than in comparable deals, (5) that there was no indication that a higher price was available from

[12] See *Unocal* (1985).

[13] See *Revron* (1986).

anyone, (6) that management refused to do a leveraged buyout at a higher price, and (7) that the chief executive officer was a major stockholder and sold his shares to the buyer at the same price paid to other stockholders. From these facts the court concluded that the directors' decision on the sale of Technicolor was fair to stockholders.

As these criteria show, in *Technicolor*, the Delaware court put a special emphasis on price competition. In particular, the court states the following definition of fair price.[14]

> "A fair price does not mean the highest price financiable or the highest price that fiduciary could afford to pay. At least in the non-self-dealing context, it means a price that is one that a reasonable seller, under all of the circumstances, would regard as within a range of fair value; one that such a seller could reasonably accept."

#### 5.2.2 Entirely Fair Prices in An Economic Model

The Court's decision and analysis of the *Technicolor* case can be explained by a simple economic model. Toward this end, think of the simple model of an M&A market as follows:

**Technicolor Model**: There are two buyers 1 and 2 and two sellers 3 and 4. Each agent, $i$, trades only one unit of good $X$, $x_i = 0, 1$. The willingness

[14] See *Cinerama, Inc. v. Technicolor, Inc* (1994).

to pay for $X$ is $\omega_i$ for buyer $i$; the production cost is $\kappa_j$ for seller $j$. Assume $\omega_1 > \kappa_4 > \omega_2 > \kappa_3$; see Figure 6.

Think of the case in which buyer 1 and seller 3 make the transaction. In the above quotation, "[that a] fair price does not mean the highest price financiable or the highest price that fiduciary could afford to pay" can be interpreted as meaning that a fair price does not have to be the price equal to the buyer's willingness to pay ($\omega_1$). Given the emphasis on outside opinions and outside offers, "[that a fair price] means a price that is one that a reasonable seller . . . could reasonably accept" may be interpreted as referring to a price that is not only higher than the seller's reservation price ($\kappa_3$) but also higher than (or equal to) any offers that the buyer might receive from other sellers ($\omega_2$).[15] Under the assumption of $\kappa_3 < \omega_2$, therefore, the *Technicolor* definition of fair price can be interpreted as a price satisfying

$$\omega_2 \leq p \leq \omega_1. \tag{9}$$

The *Technicolor* decision is concerned only with a fair price for a seller. If, however, the same logic and philosophy are applied to a fair price for a buyer, it may be concluded that a fair price must satisfy

$$\kappa_3 \leq p \leq \kappa_4. \tag{10}$$

[15] In *Technicolor*, the CEO of the target company (the seller of Technicolor) was promised the same position after the transaction, which put him on the side of the buyers of the target company as well. In applying the entire fairness test, the Court investigated whether the CEO had put sufficient effort into shopping the company to sell at the highest available price, *i.e.*, if the actual price exceeded $\omega_2$ in the present setting. The Court concluded that he in fact did clear the test.

In summary, under the entire fairness test, it may be concluded that a fair transaction is a transaction in which the price is set between the highest price that an outside buyer would offer, $\omega_2$, and the lowest price that an outside seller would offer, $\kappa_4$, i.e.,

$$\omega_2 \leq p \leq \kappa_4. \tag{11}$$

#### 5.2.3 Open Market Bargaining on Standing Offers

The price range, (11), may be interpreted of as a result of a transaction that the *Technicolor* case would find to be enterly fair. The court's opinion is, however, not based on a game theoretic model of the economic behavior of agents. It is therefore difficult to address on what criterion the entirely fair price range should be treated as economically justifiable.

For this purpose, the open market bargaining model that I have developed in my recent work is useful (Yano, 2008a). This model is developed so as to describe fundamentally competitively fair bargaining processes, i.e., bargaining processes that may take place in the Base Market in full compliance with the fundamental rules introduced above, Rules 1 throught 4. The market in the *Technicolor* case is a very close example of the Base Market. The court's opinion in the case appears to assume that the market is subject to Rules 1 through 4. The seller has only one company to sell, and every buyer (including potential buyers), decides whether or not to purchase that company. As the court's opinion emphasizes, price competition is a highly important part of the transaction. Both the seller (directors) and actual and potential buyers can be assumed to be informed agents. Anyone can participate in the market. Transaction costs can be assumed to be ignorable. Describing bar-

gaining processes in the Base Market, therefore, the open market bargaining model may provide an economic justification for the entire fairness test under Delaware law.

In open market bargaining theory, an allocation is described by a collection of contracts, which is called a contract profile. Each contract is assumed to be a collection of what are called standing offers. A standing offer describes the way in which an agent desires to make his own transaction or, more precisely, the quantity that the agent desires to trade and the price that the agent desires to trade for that quantity. It is assumed that an agent can block (object to) a contract only by making a better price offer than a standing offer.

In order to keep the model simple enough just to explain the *Technicolor* case, think of a market in which there are potentially four market participants; 1 and 2 are buyers, and 3 and 4 are sellers. For the sake of simplicity, assume that a standing offer is made by an individual market participant. A standing offer is described by the individual making the offer, $s_I \in \{1, ..., 4\}$, the quantity that the member desires to trade, $s_X$, and the price that he desires to offer in return for trading $s_X$, $s_P$. Denote a standing offer as

$$s = (s_I, s_X, s_P). \tag{12}$$

This implies that the standing offer, $s = (s_I, s_X, s_P)$, is made by individual $s_I$, who desires to trade $s_X$ units for price $s_P$. Note that this price, $s_P$, is not a unit price but the price for $s_X$ units.[16] A standing offer $s$ is said to be trivial if $s_X s_P = 0$, in which case $s_I$ either offers to trade none or to pay nothing.

[16] See Yano (2005, 2006) for a similar treatment in a unit price market.

A contract is described by a collection of multiple standing offers that do not contain more than one standing offer by a single agent. Thus, a contract can be denoted as

$$\mathbf{c} = \{s^1, ..., s^n\},\ n \geq 2; \tag{13}$$

in this expression, superscript $j$ in $s^j$ indicates the $j$th standing offer in contract $\mathbf{c}$. For the sake of explanation, think of the case in which $n = 2$. If $s^1 = (1, x, p)$ and if $s^2 = (3, y, q)$, a contract $\mathbf{c} = \{s^1, s^2\}$ is of agent 1 (buyer) and agent 3 (seller). This contract is feasible if $x = y$ and $p = q$, in which case 1 buys $x$ units from 3 at price $p$; in general, I define feasibility by means of that of an allocation specified by the contract.

A market allocation is described by a profile of contracts (contract profile)

$$\mathfrak{c} = \{\mathbf{c}^1, ..., \mathbf{c}^m\}, \tag{14}$$

where $\mathbf{c}^j$ is the $j$th contract in contract profile $\mathfrak{c}$. Assume that an agent can participate in more than one contract. Moreover, denote as $\mathbf{s}(\mathfrak{c})$ the set of standing offers underlying the contracts in contract profile $\mathfrak{c}$; i.e.,

$$\mathbf{s}(\mathfrak{c}) = \bigcup_{j=1}^{m} \mathbf{c}^j = \{s^{11}, ..., s^{1n^1}, ..., s^{m1}, ..., s^{mn^m}\}, \tag{15}$$

where $\mathbf{c}^j = \{s^{j1}, ..., s^{jn^j}\}$. The total transaction agent $i$ makes in contract profile $\mathfrak{c}$ can be expressed as

$$(x_i(\mathfrak{c}), p_i(\mathfrak{c})) = \sum_{(j,k) \in \{(j,k): s_I^{jk} = i,\ s^{jk} \in \mathbf{s}(\mathfrak{c})\}} (s_X^{jk}, s_P^{jk}) \tag{16}$$

and $s^{jk} = (s_I^{jk}, s_X^{jk}, s_P^{jk})$.

Buyer $k$'s total willingness to pay for $x_k$ units can be expressed as

$$w_k(x_k) = \begin{cases} \omega_k & \text{if } x_k \geq 1 \\ 0 & \text{if } x_k = 0. \end{cases}$$

Seller $i$'s total cost for $x_i$ units is

$$r_i(x_i) = \begin{cases} \kappa_i & \text{if } x_i \geq 1 \\ 0 & \text{if } x_i = 0. \end{cases}$$

Since a contract profile $\mathfrak{c}$ is related to an allocation by (16), the returns of a buyer $k \in \{1, 2\}$ and a seller $i \in \{3, 4\}$ can be expressed as follows:

$$\begin{aligned} \pi_k(\mathfrak{c}) &= w_k(x_k(\mathfrak{c})) - p_k(\mathfrak{c}); \\ \pi_i(\mathfrak{c}) &= p_i(\mathfrak{c}) - r_i(x_i(\mathfrak{c})). \end{aligned}$$

### 5.2.4 Fundamental Rules in Open Market Bargaining

Open market bargaining theory is based on the four fundamental rules of the Base Market. Both Rule 1, requiring the assignment of private ownership for products to be traded, and Rule 4, requiring the equal treatment of agents under the market rules, are incorporated by the setting of the model above. Rules 2 and 3 are incorporated into the model by explicit assumptions, which I discuss below.

It is more convenient to start with Rule 3 (nondiscriminatory treatment). Denote the set of contract profiles that can be formed from a set of standing offers $\mathbf{s}$ as follows.

$$\mathcal{C}(\mathbf{s}) = \{\mathfrak{c} : \mathbf{s}(\mathfrak{c}) \subset \mathbf{s}\}; \tag{17}$$

this implies that every standing offer contained in contract profile $\mathfrak{c}$, $\mathbf{s}(\mathfrak{c})$, belongs to the given set of standing offers, $\mathbf{s}$. Denote as $\mathcal{C}_F(\mathbf{s})$ the set of feasible contract profiles in $\mathcal{C}(\mathbf{s})$. With this preparation, I assume that once standing offers $\mathbf{s}$ are made, any contract profile that is feasible can be formed from those standing offers.

**Assumption 1** (**nondiscretionary treatment**): *Given that standing offers* $\mathbf{s}$ *are on market, no one is permitted to prevent the formation of a contract profile in* $\mathcal{C}_F(\mathbf{s})$ *by any non-economic reason.*

In order to guarantee that Rule 2 is satisfied in equilibrium, I say that a contract profile $\mathfrak{c}$ is individually rational if for every contract in that contract profile each member prefers participating in the contract to not. Moreover, I say that a contract profile $\mathfrak{c}$ is Pareto rational if it is not Pareto dominated by any feasible contract profile that can be formed from the same standing offers as those underlying the first contract profile, $\mathfrak{c}$ (i.e., there is no $\mathfrak{c}' \in \mathcal{C}_F(\mathbf{s}(\mathfrak{c}))$ that Pareto dominates $\mathfrak{c}$). Denote as $\mathcal{C}_F^*(\mathbf{s}(\mathfrak{c}))$ the set of individually rational and Pareto rational. In order to guarantee the voluntary aspect of equilibrium transactions, I assume that in equilibrium, a contract profile must be individually rational and Pareto rational.

**Assumption 2** (**voluntary transactions**): *No market participant is forced to make his transaction according to a contact profile that is not individually rational or not Pareto rational; in equilibrium, only a contract profile in* $\mathcal{C}_F^*(\mathbf{s})$ *is supported.*

I say that a contract profile that is both individually and Pareto rational is competitively formed, i.e., $\mathfrak{c}$ is competitively formed if $\mathfrak{c} \in \mathcal{C}_F^*(\mathbf{s}(\mathfrak{c}))$

### 5.2.5 Price Competition Equilibrium in Open Market Bargaining

In order to incorporate price competition into a bargaining process, I assume that an outsider(s) can block a contract by offering a slightly better price to a member(s) of the contract. I call such an offer an outside offer. Towards

this end, denote as a price revised standing offer

$$s * \delta = (s_I, s_X, s_P + \delta); \tag{18}$$

that is, $s * \delta$ is the standing offer resulting from revising the price offer of standing offer $s$, $s_P$, by $\delta$. Call $\delta$ a price revision to standing offer $s$. Price revision $\delta$ is favorable to a standing offer $s$ if it raises the price $s_P$ in the case in which $s_I$ is a seller and if it lowers the price $s_P$ in the case in which $s_I$ is a buyer.

Take a contract $\mathbf{c}$. An outside offer to a standing offer of contract $\mathbf{c}$, $s \in \mathbf{c}$, consists of a member, $i$, a standing offer of the member, $b$ (i.e., $b_I = i$), and an offer of a favorable price revision to the standing offer $s$, $\delta$, such that the standing offer, $b$, makes a feasible contract with the price revised standing offer, $\{b, s * \delta\}$. Denote an outside offer to a standing offer $s$ in contract $\mathbf{c}$ as $\alpha = (b, \delta; s, \mathbf{c})$. An outside offer is said to be feasible if its member is not a member of contract $\mathbf{c}$. Denote

$$\mathbf{a}_\alpha = \{b, s * \delta\},$$

which I call the intended contract of outside offer $\alpha$.

When an outside offer $b$ is made for standing offer $s$ in contract $\mathbf{c}^j$ belonging to contract profile $\mathfrak{c}$, the set of standing offers on the market will change. First, $b$ and $s * \delta$ will be put newly on the market. Since the original standing offer $s$ is changed to $s * \delta$, it is appropriate to assume that $s$ is dropped from the market at the same time as to assume that the rest of standing offers in contract $\mathbf{c}^j$, $\mathbf{s}(\mathbf{c}^j \backslash \{s\})$ remain on the market. Moreover, the standing offers constituting the rest of contracts in profile $\mathfrak{c}$, $\mathbf{s}(\mathfrak{c} \backslash \{\mathbf{c}^j\})$, remain on the market

as well. Thus, the set of remaining standing offers may be assumed to be

$$\mathbf{s}_\alpha(\mathfrak{c}) = \mathbf{s}(\mathbf{c}^j \backslash \{s\} \cup \mathbf{s}(\mathfrak{c} \backslash \{\mathbf{c}^j\}) \cup \{b, s * \delta\}. \tag{19}$$

I say that an outside offer $\alpha$ is realizable under contract profile $\mathfrak{c}$ if there is a competitively formed contract profile from the remaining standing offers $\mathbf{s}_\alpha(\mathfrak{c})$ that contains the intended contract $\mathbf{a}_\alpha$ (i.e., if there is $\mathfrak{c}' \in \mathcal{C}_F^*(\mathbf{s}_\alpha(\mathfrak{c}))$ such that $\mathbf{a}_\alpha \in \mathfrak{c}'$). In this case, I say that contract profile $\mathfrak{c}'$ realizes outside offer $\alpha$ under $\mathfrak{c}$. Denote as $\mathcal{C}_F^*(\mathbf{s}_\alpha(\mathfrak{c})|\mathbf{a}_\alpha)$ the subset of $\mathcal{C}_F^*(\mathbf{s}_\alpha(\mathfrak{c}))$ such that each element realizes $\alpha$. That is,

$$\mathcal{C}_F^*(\mathbf{s}_\alpha(\mathfrak{c})|\mathbf{a}_\alpha) = \{\mathfrak{c}' \in \mathcal{C}_F^*(\mathbf{s}_\alpha(\mathfrak{c})) : \mathbf{a}_\alpha \in \mathfrak{c}'\}. \tag{20}$$

An outside offer $\alpha$ is profitable under contract profile $\mathfrak{c}$ if it is feasible and if there is a contract profile realizing the outside offer, $\mathfrak{c}' \in \mathcal{C}_F^*(\mathbf{s}_\alpha(\mathfrak{c})|\mathbf{a}_\alpha)$, that every member of the outside offer prefers to the current contract profile, $\mathfrak{c}$. As is noted above, a contract profile $\mathfrak{c}$ is an open market bargaining equilibrium if $\mathfrak{c}$ is competitively formed from its own standing offers, and if there is no profitable outside offer to any standing offer(s) in any contract in that profile, $\mathfrak{c}$.

With this preparation, I may prove the following (see Yano (2008a) for a proof).

**Theorem 3 (Yano, 2008a)** *Let $s^j = (s_I^j, s_X^j, s_P^j)$. A contract profile $\mathfrak{c}$ is an open market bargaining equilibrium if and only if $\mathfrak{c} \in \mathfrak{E}$ where*

$$\begin{aligned} \mathfrak{E} \;=\; & \{\mathfrak{c} = \{\mathbf{s}\} : \mathbf{s} = \{s^1, s^2\}, \\ & (s_I^1, s_X^1, s_P^1) = (1, 1, p),\ (s_I^2, s_X^2, s_P^2) = (3, 1, p),\ \omega_2 \le p \le \kappa_4\}. \end{aligned} \tag{21}$$

As is noted above, Rules 1 through 4 are observed in an open market bargaining equilibrium. The model, moreover, describes price competition in the Base Market. Therefore, it may be concluded that an open market bargaining equilibrium is fundamentally competitively fair. A comparison between Theorem 3 and condition (11) shows that the price range that is established in the *Technicolor* case, (11), is identical to that in the open market bargaining equilibrium in Theorem 3. These results may be summarized as follows:

**Proposition 2** *The transaction in the* Technicolor *case may be interpreted as an open market bargaining equilibrium, which is competitively fair in the Base Market.*

# 6 Concluding Remarks

Only high quality markets can support the diversification leading to, and diversity supporting, an Age of Quality. When I use "diversity" in this context, I am referring to the diversity of tastes and needs, and also the diversity of products, technologies and even markets to satisfy these tastes and needs.

The 20th century was, broadly speaking, an age of mass production and mass consumption. Early in the 20th century Henry Ford developed what came to be known as the Ford system for mass-producing automobiles. Thanks to this system, the price of a Model T Ford went down from 850 dollars in 1908 to 290 dollars in 1915. This production method was incorporated

throughout manufacturing and was responsible for the leap in productivity that occurred in the early 20th century. The desire for economies of scale produced cost reductions that enabled extremely large numbers of people to consume extremely large amounts of industrial goods.

Since the latter half of the 20th century, we have witnessed an acceleration in the diversification of tastes and needs and a resulting diversification of products, technologies and markets. This was supported by the productivity gains since the second industrial revolution. Mass production and mass consumption brought affluence that encouraged people's tastes and needs to become more specific and, therefore, more diverse. Products and technologies diversified in response to this, leading to the formation of any number of new markets. As tastes and needs diversify, they are brought into the market through the diversification of products and technologies, which leads to the formation of new markets. This in turn results in further diversification of tastes and needs. This entire process may be referred to as the "internalization of diversity."

The 21st century is likely to see a dramatic leap in production capacity thanks to technology advances like the IT revolution. Productivity gains will support greater diversification of tastes and needs, which will then result in greater internalization of diversity. This is what will encourage people to believe the Age of Quality is on the way.

The Age of Quality must allow the markets to drive the process of internalizing diversity. We cannot turn to the government to do this. Unlike economies in the developmental stage, today's leading countries have no models on which to rely, and it is inconceivable that the government would be able

to predict the diversification of consumer tastes and needs more accurately than the markets.

Internalizing the increasingly diverse tastes and needs of consumers into the market requires that we come up with as many ideas as possible and let the consumers, through the market, select those that will ultimately survive. It is crucial, therefore, that we have product markets capable of accurately reflecting consumer tastes. Markets that can do this are high quality product markets.

In order to select by market mechanism those businesses that will ultimately survive among a large number of business plans, it is necessary to have high quality labor markets. A high quality labor market is one in which the skills of workers are correctly valued, appropriate human resources are assigned to appropriate positions, liquidity is high, and there are any number of chances to try again if one fails. The process of choosing from a large number of ideas requires that we make heavy investments of human resources in businesses that have the potential to fail. If we do not maintain highly-liquid labor markets where people have the chance to try again after failure, we will be unable to make effective use of our human resources should those people be unlucky enough to have been involved in failures. For example, even if a venture goes under, the people involved must be fairly valued for their willingness to take chances, and they must be given the opportunity to try again. Without such labor markets, few, if any, workers will choose to work at companies exploring new ideas, and there will be no system for testing new ideas on the market.[17]

[17]For formal treatments of the development of new markets, for example, see Yano

I also argue that increasing the overall wealth of an economy in the Age of Quality requires that large numbers of consumers have deep insight into the economy of the future and access to high quality capital markets in which they can participate as ordinary investors. High quality capital markets require excellent markets for venture capital, for equity and for debt, providing a system by which large amounts of money can be invested in a wide variety of businesses.

Internalizing diversity requires that we weigh the relative importance of many competing business plans as we allocate abundant investment funds. It is we, the consumers, who as a group ultimately decide which businesses will be accepted by the markets. It is therefore we, the consumers, who must decide the businesses we want to invest our money in and see grow. For this to happen, there must be consumers who are able to anticipate the future skillfully and who participate broadly in capital markets as ordinary investors.

While developing economies may be able to look to more advanced economies for hints, for those economies in the vanguard, it is inconceivable that governments and institutional investors would be able to make better decisions on the economic future than the average decision made by large numbers of consumers. Only when ordinary consumers are able to invest funds at their own discretion in a wide range of business plans will we achieve the capital formation required for the Age of Quality.

Healthy growth in the modern economy, discussed in the Introduction,

and Dei (2006a, 2006b), Yano and Komatsubara (2006), and Bacchiega, Gabszewicz, and Tarola (2007).

may be thought of as growth that is driven by high quality markets. It is not a high speed growth like that which Japan achieved in the 1960s and 70s in pursuit of "mere efficiency." It is a growth that is achieved through fair market competition by which gains from trade can be distributed in a competitively fair fashion. The dislike that various societies have with respect to an uneven distribution of wealth may be attributable to the perception that an uneven distribution is the result of accumulated unfair distributions of gains from trade in a market. If so, a fair distribution of wealth may be analyzed from the viewpoint of market quality.

# References


[1] Bacchiega, Emanuele, Jean Gabszewicz, and Ornella Tarola (1957) "Time-to-market in vertically differentiated industries," *International Journal of Economic Theory* 3, pp. 279-295.

[2] Baumol, W., J. Panzar, and R. Willig (1982) *Contestable Markets and the Theory of Industry Structure*, New York: Harcourt Brace Jovanovich.

[3] Bertrand, J. (1883) "Theorie mathematique de la Richesse Sociale par Leon Walras and Recherches sur les principes mathematique de la theorie des dicheses par Augustin Cournot," *Journal des Savants,* 499-508, 1883; translated by James W. Friedman in Andrew F. Daughety, ed., *Cournot Oligopoly*, Cambridge, Cambridge University Press, pp. 73-81 (1988).

[4] *Cinerama, Inc., v. Technicolor, Inc.,* 663 A.2d (Delaware Court of Chancery, 1994).

[5] Coase, Ronald (1994) "The problem of social cost," *Journal of Law and Economics* 3, 1-44.

[6] Creane, Anthony (2007) "Note on uncertainty and socially excessive entry," *International Journal of Economic Theory* 3-4, 329–334.

[7] Dei, Fumio (1999) *Private Communication.*

[8] Demsetz, Harold (1968) "Why regulate utilities?" *Journal of Law and Economics* 11, pp. 55-65.

[9] Dos Santos Ferreira, Rodolfe, and Frédéric Dufourt (2007) "Free entry equilibria with positive profits: A unified approach to quantity and price competition games," *International Journal of Economic Theory* 3, pp. 75-94.

[10] Edgeworth, Francis (1881) *Mathematical Psychics.*

[11] Edgeworth, Francis (1897) "La teoria pura del monopolio," *Giornale degli Economisti* 40, pp. 13-31. In English, "The pure theory of monopoly," in *Papers Relating to Political Economy*, vol. 1, ed. F. Edgeworth, Macmillan, London (1925).

[12] Higuchi, Yoshio (2005a) "*Koshitu na rodo shijou no keisei ni mukete*," in Japanese (To form quality labor markets), in Yoshio Higuchi, Toshihiro Kodama and Masahiro Abe eds., *Rodo Shijou Sekkei no Keizai Bunseki* (*Economic Analysis of Labor Market Design*) Tokyo: Toyo Keizai.

[13] Higuchi, Yoshio (2005b) *Nihon no Kakei Kodo no Dainamizumu* I, in Japanese (*Dynamism of Household Behavior in Japan*), Tokyo: Keio University Press.

[14] Higuchi, Yoshio (2008) "Support for the continued employment of women: The effects of labor law reforms and macroeconomic conditions," in M. Yano, ed., *The Japanese Economy - A Market Quality Perspective*, Tokyo: Keio University Press, pp. 79-110.

[15] Higuchi, Yoshio, Masakazu Kimura, and Michio Naoi (2008) "Keio Household Panel Survey (KHPS): Outline and purposes," in M. Yano, ed., *The Japanese Economy - A Market Quality Perspective*, Tokyo: Keio University Press, pp. 21-30.

[16] Higuchi, Yoshio, and Ryuichi Yamakawa (2008) "Policies to create high quality labor markets: From the perspective of law and economics," M. Yano, ed., *The Japanese Economy - A Market Quality Perspective*, Tokyo: Keio University Press, pp. 111-134.

[17] Hosoda, Eiji (2008) "A new regime for high quality recycling in the East Asian Region," M. Yano, ed., *The Japanese Economy - A Market Quality Perspective*, Tokyo: Keio University Press, pp. 267-280.

[18] Ikeo, Kazuhito (2008) "Financial system reform: Status and issues," M. Yano, ed., *The Japanese Economy - A Market Quality Perspective*, Tokyo: Keio University Press, pp. 153-166.

[19] Jones, Ronald (1965) "The structure of simple general equilibrium models," *Journal of Political Economy*, 73, pp. 557-572.

[20] Kurokawa, Yukiharu (1890) "The quality of earnings and the quality of capital market," M. Yano, ed., *The Japanese Economy - A Market Quality Perspective*, Tokyo: Keio University Press, pp. 195-216.

[21] Marshall, Alfred (1890) *Principles of Economics*, London: Macmillan and Co., Ltd.

[22] McKenzie, Lionel (1959) "On the existence of general equilibrium for a competitive market," *Econometrica* 27, pp. 54-71.

[23] Miyoshi, Koyo (2007) "Male-female wage differentials in Japan," *Japan and the World Economy*, forthcoming (doi:10.1016/j.japwor.2007.06.003).

[24] Murakami, Masahiro, and Makoto Yano (2007) "Yuuetsuteki chii no ranyo no kinshi," (Prohibition of the abuse of dominant power), in M. Yano, ed., *Ho to Keizaigaku* (Law and Economics), Tokyo: Tokyo University Press, pp. 34-47.

[25] Naoi, Michio, Kazuto Sumita, and Miki Seko (2007) "Earthquakes and the Quality of Life in Japan" *Journal of Perperty Research* 24-4, pp. 313-334.

[26] Rawls, John (1971) *A Theory of Justice*, Cambridge: Belknap.

[27] Rawls, John (2001) *Justice as Fairness: A Restatement*, Cambridge: Belknap.

[28] *Revlon Inc. v. MacAndrews & Forbes Holdings, Inc.*, 506 A.2nd 173 (Delaware Court of Chancery, 1986).

[29] Smith, Adam (1776) *An Inquiry into the Nature and Causes of the Wealth of Nations.*

[30] *Unocal Corp. v. Mesa Petroleum Co.*, 493 A.2d 946, (Delaware Court of Chancery, 1985).

[31] Wachtell, Lipton, Rosen & Katz (2004) "Takeover law and practice 2004," unpublished mimeo.

[32] Yano, Makoto (1984) "The turnpike of dynamic general equilibrium paths and its insensitivity to initial conditions," *Journal of Mathematical Economics* 13, pp. 235-254.

[33] Yano, Makoto (2001) *Ouyou Mikuro Keizaigaku*, (in Japanese, *Applications of Microeconomics*), Tokyo: Iwanami, Tokyo.

[34] Yano, Makoto (2005a) "Coexistence of large firms and less efficient small firms under price competition with free entry," *International Journal of Economic Theory* 1, pp. 167-188.

[35] Yano, Makoto (2005b) *Shitsu no Jidai no Sisutemu Kaikaku*, (in Japanese, *System Reform in the Age of Quality*), Tokyo: Iwanami.

[36] Yano, Makoto (2006) "A price competition game under free entry," *Economic Theory* 29, pp. 395-414.

[37] Yano, Makoto (2008a) "Competitive fairness and the concept of a fair price under Delaware law on M&A," *International Journal of Economic Theory* 4, pp. 175-190.

[38] Yano, Makoto (2008b) "Economic analysis of market quality," in *The Japanese Economy - A Market Quality Perspective*, Makoto Yano, ed., Keio University Press, Tokyo, pp. 3-20.

[39] Yano, Makoto, and Fumio Dei (2006a) "Network externalities, lexicographic demand shifts, and marginal cost dumping," *Keio Economic Studies* 42 1-2, pp. 115-130.

[40] Yano, Makoto, and Fumio Dei (2006b) "Network externalities, discrete demand shifts, and submarginal-cost pricing," *Canadian Journal of Economics* 39, pp. 455-476.

[41] Yano, Makoto, and Yuichi Furukawa (2008) "Industrial revolution cycles and the quality of intellectual property markets," mimeo., Kyoto University.

[42] Yano, Makoto, and Takashi Komatsubara (2006) "Endogenous price leadership and technological differences," *International Journal of Economic Theory* 2, pp. 365-383.

[43] Yano, Makoto, and Takashi Komatsubara (2008) "Law and economics of M&A markets," in M.Yano, ed., *The Japanese Economy - A Market Quality Perspective*, Tokyo: Keio University Press, pp. 217-235.

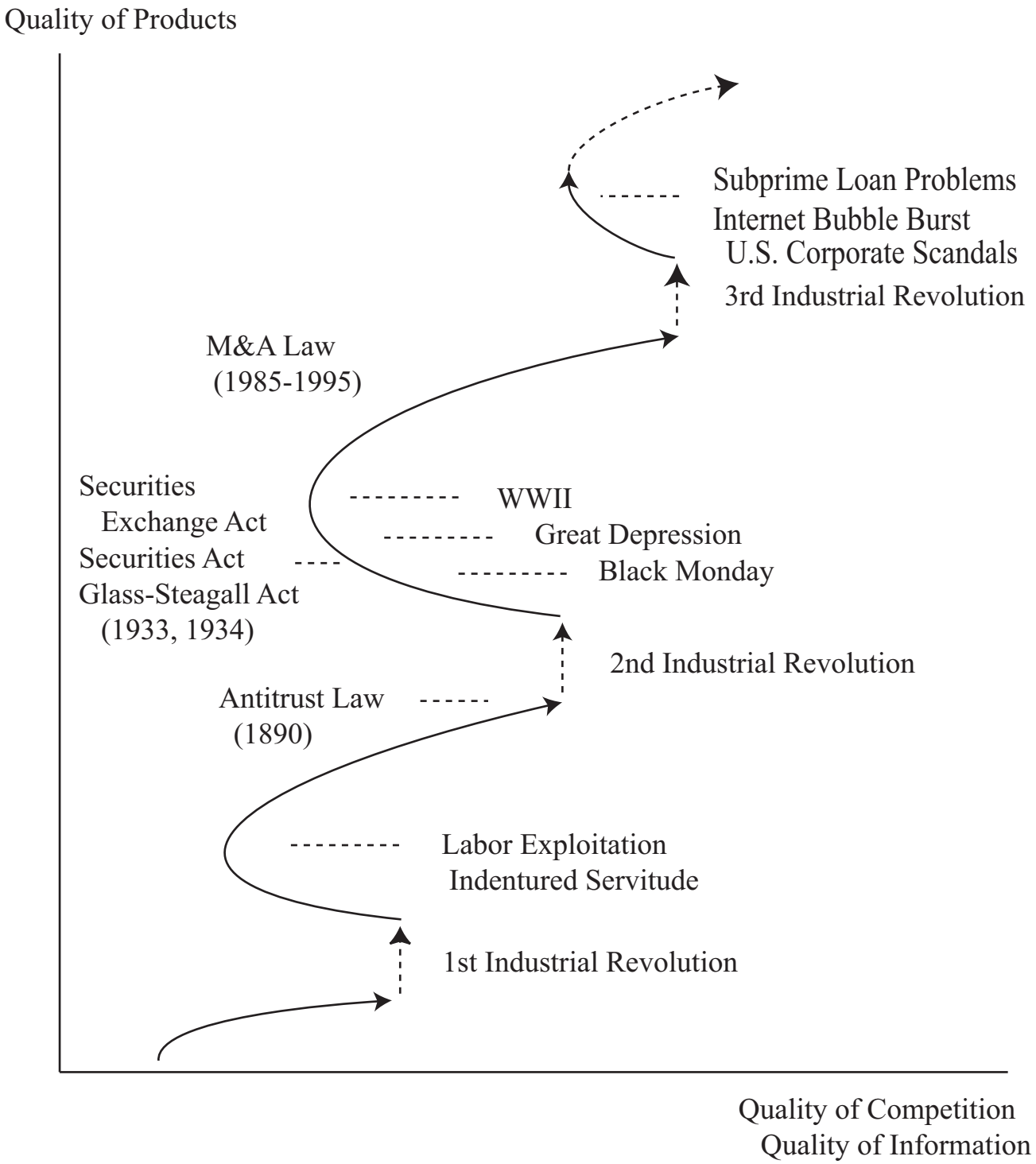


Figure 1: Tripple-C Dynamics of Market Quality

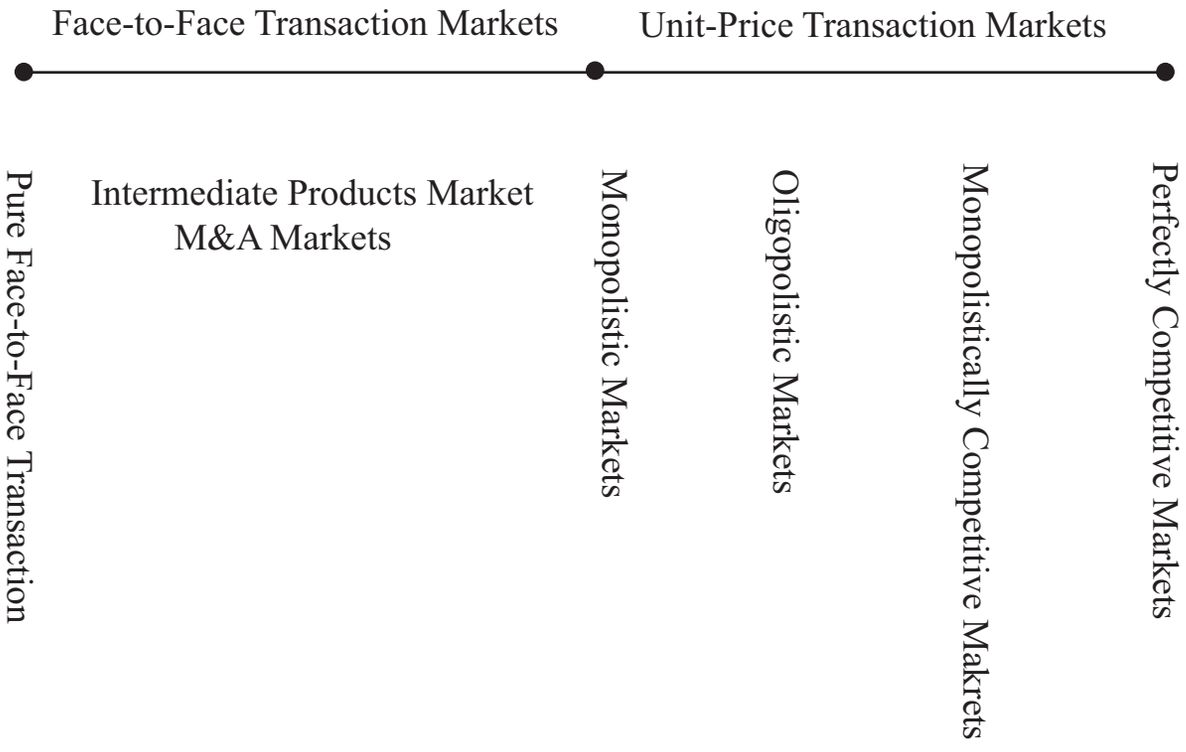


Figure 2. Market Spectrum

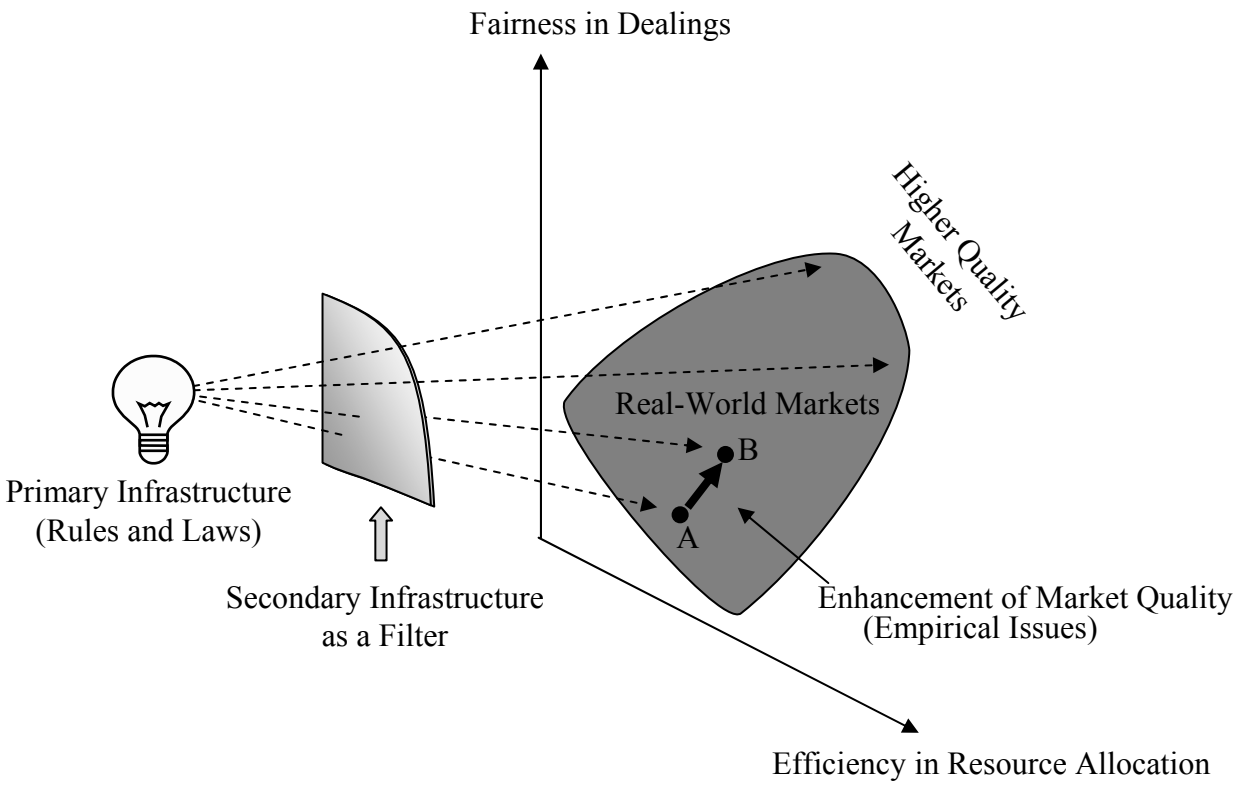


Figure 3: Market Infrastructure and Market Quality

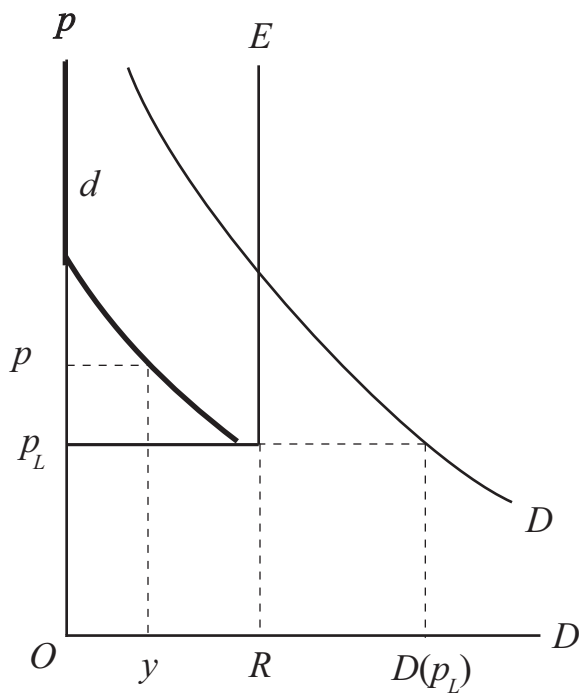


Figure 4. Edgeworth's Bertrand Criticism

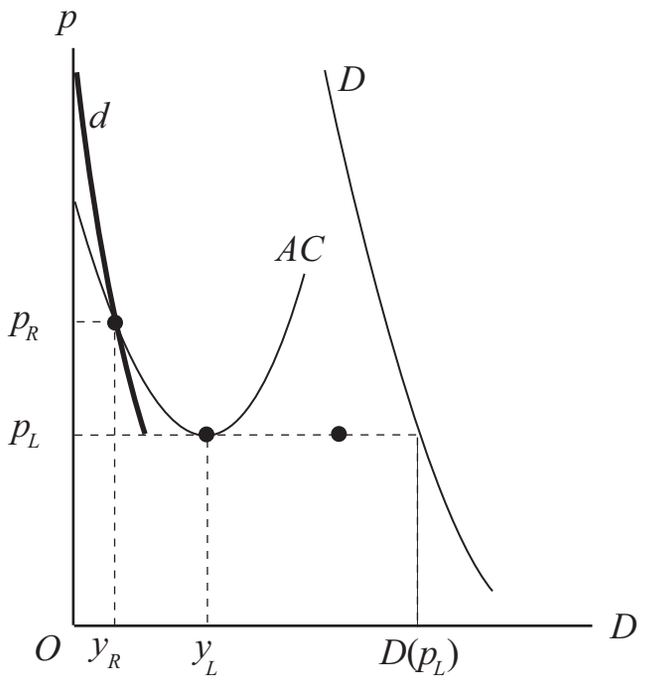


Figure 5. Dual Price Equilibrium

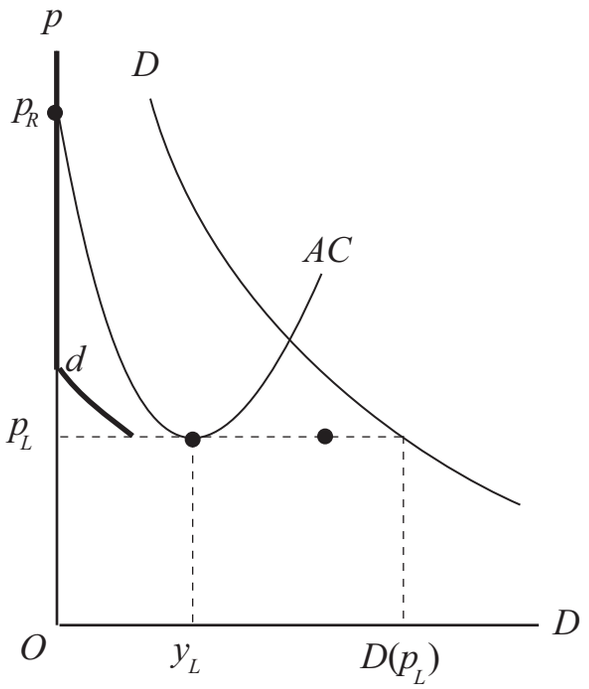


Figure 6. Single Price Equilibrium

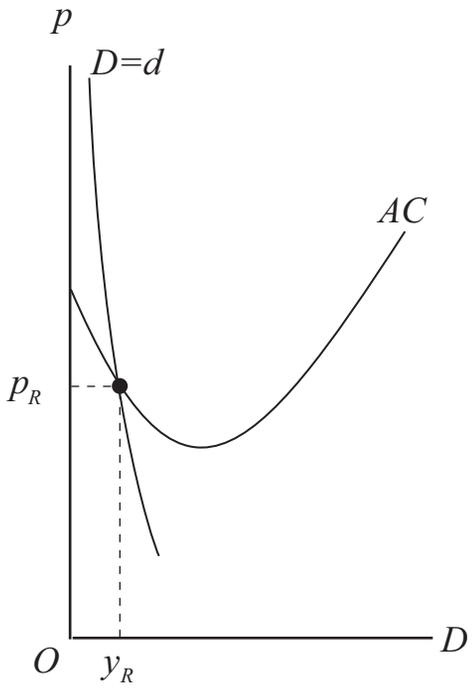


Figure 7. Demsetz's Natural Monopoly Equilibrium

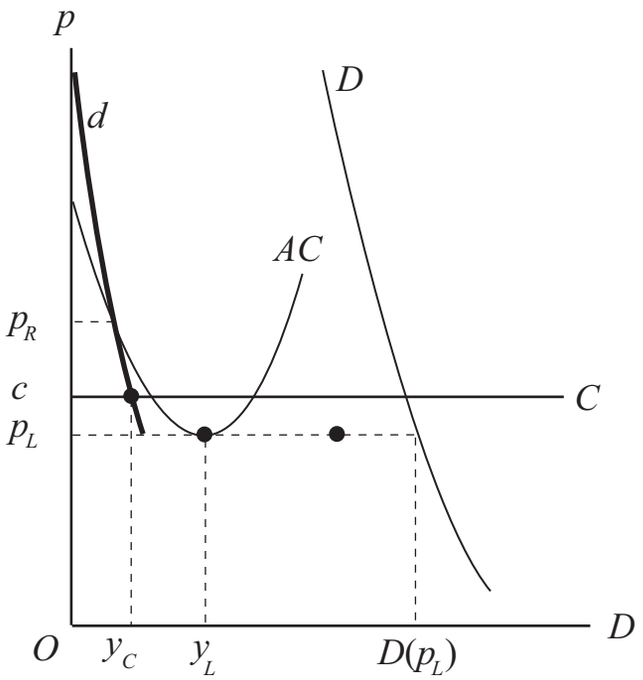


Figure 8. Multi-Firm-Sizes Equilibrium