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Price Discovery, Competition

And Market Mechanism Design

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Abstract

Based on the wide application of relevant classical and modern economic thoughts, this paper analyzed the implications of price discovery and competition, compared the market auto adjustment mechanism and the government control of economy, explored market failure and price distortion, and drew the conclusion of the necessity of market mechanism design which is especially helpful for the reform of transitional economies. We point out that market competition plays an important role in the process of price discovery. To promote the efficiency of price discovery, market competition can not be absent. But competition can not be the only solution to efficiency. Moderate government interference is needed in some circumstances. Optimal mechanisms should be designed to complement the incompleteness of competition.

Keywords: Price discovery, Competition, Mechanism design

1. Price discovery and competition

Price discovery is an important and common function of markets. Competition in trading plays an important role in the price discover process. The competition process is at the same time the price discover process in a transaction.

There will be competition when there are two or more sides who have their own interests. So, competition is a normative phenomenon. The notion of competition is widely used by economists.

Adam Smith (1776) put forward that through free competition the market supply and demand will tend to be stable, and the market price and natural prices will tend to be equal. In other words, competition plays a critical role in the rule of market supply and demand. Within an industry, the one who owns productive resources will work hard to put the resources to the most profitable business. Through competition, the rate of return of the same resources tends to be equal. If the one who owns the resources can only acquire a lower return, he or she will adjust the allocation of resources to pursue higher profit.

Jean-Baptiste Say emphasized more the effect of competition in the market system. Competition encourages invention and innovation activities, and compels manufacturers to work hard to lower the production cost, thus causing prices to descend and the profits of an industry to fall on an average level. Consumers may profit from the decrease of prices. Because of the existence of competition among purchasers, the sellers may also get ideal selling prices (Note 1).

The Hayek inherited the Austrian school's method of dynamic process analysis to study the market mechanism. Hayek (1968) asserted that competition, like scientific experiment, is firstly a discovery procedure. In a price system, the system must depend on a kind of ex-ante market discovery process if it can signal mutually and keep coordinated well, and get full adjustment and reach equilibrium. The value of competition lies in that competition is a discovery procedure, a process of ideas formation.

The competitive market process is a process of making use of scattered information for price discovery. Competition will lose its value if the result of it may be predicted (Note 2). But people usually can't acquire enough knowledge to predict the result of competition, so, competition is still essential.

The argument that competition is a discovery procedure indicates the necessity of the existence of the market system. In the market, knowledge scattered among numerous market participants is made use of and is enlarged. The market provides a place to test and compare the resolution of different problems. During the process of competition, market participants constantly make trials and learn, and adjust their own preference according to knowledge acquired.

Consumers may discover what the best, the cheapest merchandise are. Manufacturers may discover what goods or services consumers want to purchase finally and find the most efficient way to producing those goods or services. Therefore, since the optimum solution to a problem can not be known and can not be designed beforehand, the trials and relevant incentive mechanisms shall be made as to the methods to solve the problem. New methods may be proven to surpass the existed ones through experiments.

Price is a core factor of an exchange of goods or services. Competition is a discovery procedure that is related with the constant change data concerning the transaction, that is, a price discovery process that different market participants make constant trials and comparisons and form final prices.

The existence of the market power means to have a kind of power to prevent others to provide goods or services to customers in a better way. When the market power of different market participants is unbalanced, the one who owns the power to influence others may manipulate prices to prevent competition which does not benefit him or her. Under such circumstances, there will be the necessity to make laws such as anti-trust act. Hayek insisted that one possible solution is to establish some incentive mechanism to double compensate those who feel discriminated so as to the potential competitors may face fair treatment when monopolists implement price discriminations for their own interests.

As competition becomes more and more intense, competition can make the market player who obtains advantages obtain more and more advantages, the market may be dominated by less and less large scale suppliers or manufacturers. In the end, there might be only one supplier or manufacturer left in the market. During the competition process, there might be collusion among suppliers when there are a limited number of suppliers left. In other words, they might negotiate privately to set higher prices so as to make more profits when they are able to prevent effectively new suppliers from entering the market.

It is extremely important whether the market structure is perfect or not and what role the market supervisor may play. The role of the supervisor should be to construct a mechanism to promote competition and make competition emerge in any transactions. Generally speaking, the role of the supervisor lies in providing a kind of environment where innovation and competition can be promoted. Therefore, the competitive forces may drive the evolution of the market structure. The supervisor should try to make players be engaged in innovations that may benefit all parties in a favorable competitive atmosphere rather than determine what the optimal market structure is.

Under the condition of vehement competition, the government in the actual world faces the dilemma of how to make a choice between promoting competition to with guarantee the operation of the market mechanism and limit the intensity and scope of competition to reduce opportunity of the emergence of monopoly. It is the degree of competition that the government should ponder upon, which concerns the concrete way of government interference in the economy, that is, what the regulated object is, to what degree the regulation shall be, at what time and in what manner.

Different from emphasizing competition, John Mill pointed out that although economists generally had been accustomed to lay almost exclusive stress upon competition, to exaggerate the effect of competition, and to take into little account the other and conflicting principle, sometimes competition actually had no effect on the market. What came to effect sometimes are customs which were usually neglected. The history shows to us that many transactions and engagements are under the influence of fixed customs. This is a major complement to the theory of competition. In fact, different powers may sometimes exist simultaneously; sometimes exist alone in the process of price formation. In some situations, what come into effect are customs which will affect prices according to buyers' and sellers' view of fairness or justice. In some industries, conditions of bargaining are negotiated inside. If someone deviates from fixed customs, the industrial organization will adopt some punishment measures to place them in a disadvantageous position. Some charging standards can be regarded as the result customs.

The function of customs indeed exists in the actual world, but we believe that normatively speaking, the function of customs can not replace that of competition. The effect of customs might not lead the market to a competitive equilibrium. Then the efficiency of the market is low. The invalidation of competition may lead to market failure.

2. The self-adjustment of the market and governmental regulation

The quarrel of the market mechanism has already been a focus of economic discussions. As to what role the government should play, there exist two major viewpoints, the one in favor of government regulation and the one against it.

The government regulation question came from the dispute of economic thoughts of free market and governmental interference. The ancient Greek sages such as Socrates, Plato and Aristotle have discussed about questions like individuals and groups, centralization and dispersion of power, freedom and control. The physiocrats and mercantilists emphasized the government intervention and liberalism respectively. After the classic market freedom idea had dominated economic thoughts for a long time, the Keynesian doctrine in the 1930s again insisted that government should play an important role in the economy, which had a deep influence upon later economic thoughts and policies. Different schools of thoughts prevail now and then or exist at the same time. The dispute between new classicalism and neo Keynesianism still continue today. Currently, the interventionism and liberalism are both kept in economics. As to how the government should take effect, regulatory theories have presented more detailed and concrete studies.

The viewpoints in favor of free market believe that the free market mechanism can auto adjust itself, with no need of governmental intervention. Both the classical and the new classical standpoints approve the free market mechanism which has the function of guaranteeing efficient allocation and utilization of economic resources in our society.

Adam Smith elaborated the classical doctrine of the advantages that the free market mechanism has in early era. The major theme of his great work of literature The Wealth of Nations has to do with the interaction between government and the economic order. Smith's presupposition is selfishness of individuals. He believed that selfishness could contribute to the whole social welfare. He explained the reason of market prices fluctuating around natural prices and asserted that this fluctuation came from the changes of market supply and demand. The environment of free competition could lead to fair prices, and vise versa, the price mechanism might lead to the flow of social resources. If the market price was below or above the natural price, the supplier would depress or extend his or her investment or production. Smith criticized such popular Mercantilist intervention views as the government providing subsidies at that time. He advocated the free market mechanism where justified competition existed. Thereout he laid the foundation of the free market economics.

Smith claimed clearly that trade should be conducted liberally. He opposed the government control of the economy under many circumstances. He pointed out that it was totally groundless to organize some industry for the purpose of better management of it. Smith's viewpoint toward the task of government was that the government's power should be limited to lawmaking and judicatories, protection of the country's safety, resistance against the enemy country, and construction of some public facilities.

According to the principle of "Supply creates demand", the social aggregate supply can always be equal to the social aggregate demand, which is usually called "the Say's Law", whose policy indication is that government does not need to interfere in the economy. The market may in every opportunity turn the economy to equilibrium automatically. Say observed that "A law, that simply fixes the price of commodities at the rate they would naturally obtain, is merely nugatory, or serves only to alarm producers and consumers, and consequently to derange the natural proportion between the production and the demand; which proportion, if left to itself, is invariably established in the manner most favourable to both." (Note 4)

When discussing what effect a government should take upon the market, Mill mentioned that to keep the economy liberal is the general principle that a government should follow. But this was not a widespread applicable principle. There were many exceptions (Note 5). Mill inherited the classic liberalist creed of "The government shall interfere as less as possible" and claimed that the government's intervention of social affairs should be limited to the minimum scope. He brought forward that in any situation, it were those who laid claim to government intervention instead of those who were for free market who should be responsible for the proof of their ideas. The violation of the non-interference principle must lead to drawbacks except that there existed huge interest drive to the violation.

Marshall, the founder of modern microeconomics, put forward the partial equilibrium theory, and elaborated the new classic price theory in the condition of perfect competition. The new classic theory is based on the hypothesis that individuals are totally rational and the market is totally frictionless. Its method of analysis is more precise than that of previous theories. It raised a series of presuppositions, including symmetric information, non-public goods, homogeneous products and zero transaction costs, under which the market mechanism may function as the "invisible hand" that may adjust by itself to be clear, without the government intervention.

People who further investigated the market mechanism broke through the assumptions of Marshall's theory, but still got the same conclusion. The government can not grasp so much information as to judge individual behavior. Thus it lacks the capability of interference. If it intervenes the market, the prices might be distorted and the efficiency of price discovery might be harmed. Rational individuals know better than the government what measures to take to realize their own aims. Even the government can acquire all information about all individuals, the latter show more direct and stronger demand of their own interests. The measures that the government takes may not be all unprejudiced. Contrary to complementing the drawbacks of the market mechanism, the government intervention may make the original problems worse (Peltzman, 1976; Stigler, 1971). Therefore, the government should allow individuals to take their own measures to realize their own aims.

Similar to the standpoint of the information economics, Hayek believed that the dispersed knowledge in our society is numerous and complicated. No agency or individual may master all the scattered and changing knowledge in time. In such case, there is no other choice except the market which may gather together various knowledge. Hayek limited the mission of the government tightly to protect law execution, and to maintain a just, transparent market and social order. The reason of the existence of a government is that a government can run a legal system and keep order professionally. The cost of governmental behavior is much less than individual in sustaining economic and social order. That is why individuals in different industries would like to pay for governmental agencies. The reasonable functioning of government means the market mechanism has been strengthened and the order of the division of labour has been expanded.

3. Market failure, price distortion and government intervention

Different from the ideal market, the market mechanism does not always succeed in its operation. It is sometimes inefficient for the market mechanism to allocate resources, which is called market failure whose direct symptom is price distortion. There are many reasons to make prices distorted, such as the imperfect competition of the market, the existence of public goods, and incomplete information.

Soon after Keynes put forward the theory of effective demand, the discussion of the issue of free competition and government intervention causes the born of many new economic flows. Some people found that the invisible hand is powerful but not omnipotent. The Marshallian new classical theory needs a series of assumptions. Many economists point out that in the non-classic economic environment, when factors like public goods, externality, and bounded rationality exist, the competition mechanism possibly may lead to non-Pareto optimum allocation of resources, or to say, the market will not become clear automatically. Further study gradually relaxed the previous assumptions and made new explanations of the market mechanism.

Competition is the key factor through which the market mechanism may take effect. If competition is weakened, so will the function of the market mechanism. The difference of products, the transaction costs and some monopolies may change the bargaining power of market players and weaken competition in the market. In fact, some classic economists have already realized the limits of market mechanism. What Smith proposed is the competition that the market may bring about. But he also realized the limits of the market. So he also supported some regulation of the economy by the government. It seems to have been misunderstood that Smith was in favor of the perfect market system. There is actually no term like "the lassie fair economy" appeared in his works. Smith began his discussion with the assumption of selfish individuals who pursue their own maximum profits. But he opposed the self behavior in the market which harmed competition. Smith reminded that we should prevent the tendency toward monopoly to the aim of self interest. He pointed out that people gathered together more for the sake of negotiating for the raising of prices than for the sake of entertainment. It would be hard to prevent such private gatherings by law. But the law should make such gatherings hard to appear. Smith believed that organizations within an industry usually were for the purpose of restrict inner competition. It was necessary for governments to take measures to protect competition and restrict the formation of monopoly.

The goods in the market are not all homogeneous. Can consumers distinguish the minor differences? They do not always have the ability to do to distinguish accurately. Mill put forward that the government should present help when consumers could not make good judgments. The value of some merchandise is hard to be estimated in the market. For example, those who demand of knowledge are sometimes not those who need it most. Those who need to acquire more knowledge sometimes refuse the demand of knowledge. In this situation, the market supply which is offered according to the demand is not what the society really needs. The government should surmount the people's self-moving need to the knowledge, providing better education to people. This example shows to us that the non-interference principle does not adapt in all situations.

What Mill analyzed is in fact an example of public goods. Similar situations also occur to public green fields, city streets and national parks. The consumption of the public goods also needs costs. The construction and maintenance of grasslands, roads and parks need expenditures. Different from the payment of common goods, the suppliers can not charge directly the demanders of public goods. So the cost and income can not be shared among each consumer reasonably. Those consumers who do not bear the costs will not care much about these public goods. For example, some people may tread on grass fields. Then the phenomena of "public tragedy" and "free riders" emerge. When public goods exist, the competitive equilibrium cannot lead to Pareto optimum because the high price which may attract producers is inefficient as to allocation and consumption (Samuelson, 1955). When there is market failure, the government needs to intervene in the economy to guarantee the right way of economic development.

Keynes' study on the limit of market mechanism or governmental function has had a profound influence upon economic thoughts and policies worldwide. The economy is sometimes in the condition of shortage of effective demand, which denies the viewpoint that the market may reach equilibrium by itself. In most situations, the market is not clear. The economy is constantly in a condition of lack of effective demand and structurally imbalanced. So Keynes brought forward that the economy should be adjusted by government on a macro-level to complement the weakness of the market. The contemporary new Keynesian economists provided such micro basis as wage stickiness, price stickiness and incomplete information for Keynes' viewpoints.

Analyzing from the standpoint of justice, we may find that the government should regulate trades and maintain the principle of fair trade. In the condition of perfect competition, buyers and sellers may trade voluntarily by equilibrium prices. In the condition of imperfect competition, prices may be distorted because of possible existence of cheats or coerces. Therefore, the prices might be unfair. There is need to regulate prices by law or moral standards to create a society in which all players have equal opportunity to make profits.

Analyzing from the standpoint of information, we may find that the cause of market failure is incomplete information. The ill transfer of information or asymmetry of information will affect the formation of prices. The uninformed or ill informed manufacturers or consumers will possibly form mistaken valuation of goods, which will harm the price discovery efficiency. The distorted price signal will probably cause incorrectly the tendency of production or consumption. Incomplete information may lead to two other phenomena, adverse selection and moral hazard, which will make the market less efficient.

4. Contrast of the theories and reality and the mechanism design theory

The idealized theories differ to some degree from the actual world. There is no government which has not interfered in its economy in the whole human history although the liberalists have dominated the economic thoughts for a long period of time. We shall not forget about the assumptions of theoretical analysis upon which the theories lie. Otherwise, the theories will be misused and lose sense.

In the actual world, governments widespreadly interfere in the economy. It is only the scope, degree, time and way of interference that differ across countries. The complementary and substitute effect of the government to the market lies in the creation of a competitive system. Competitive forces may drive the evolution of market structure. The regulators shall not try to determine what the optimal market structure is, in stead, they shall leave the task to market players who may be engaged in innovative activities in a competitive atmosphere. Of course, the regulators might not be fair enough in their supervision of the market. So there is the problem of regulating effectively the regulators.

In the actual world, in order to improve the efficiency of the economic system, it is not enough to depend only on the market mechanism. We must look for other complementary mechanisms (Tian, 1989). So, the real economic system is a "moderate" outcome between liberty and interference, a mixed economic system that includes both the effect of the market and that of the government.

In the operation of the hybrid economy, we need to adopt non-market measures to solve the market failure problem. Hence appeared the mechanism design theory by Hurwicz (1960, 1972). Maskin and Myerson developed the theory. These three economists won the Nobel Prize of 2007 in economics. They helped us understanding the optimal mechanism choice by explaining individual incentives and private information. People may design effective trading mechanisms, regulatory methods and voting processes.

Many researches assumed that the economic institutions or mechanisms were external, taking the market mechanism as an object of study. But does the market mechanism need to be changed, too? Are there other better economic systems in addition to the pure market mechanism? To answer these questions, we need to internalize the economic mechanism, considering the design of it, evaluating it under certain standards. This is the main concern of mechanism design theory. Simply speaking, the mechanism design theory studies the design of economic system that suits both the market players' aim of interest and the aim of the designers under the circumstance of free choice, voluntary exchange and decentralized decision making.

The economic individuals might withhold some information, or release implicit information, or even fabricate deceitful information for personal purposes. To solve this problem, Hurwicz (1960, 1972) raised an important concept of incentive compatibility, that is, in a given mechanism, the economic system can be regarded as a complicate strategic game. The system is incentive compatible if all players report their true private information and dominant strategies. Under such circumstances, the system may realize what the designer aims at even if each participant behaves abiding by his or her own strategy. The economic system may reach some efficient equilibrium in a certain incentive compatible environment.

The mechanism design theory adopts many research methods and concern different economic schools. Or to say, many economic studies have touched the question of mechanism design. Hammond (2002) pointed out that in past 20 years, there are abundant works which have studied incentive compatibility which have been merged into many branches of economic study.

McFadden (2007) categorized literature concerning mechanism design into three major branches, incomplete information, incentive and bounded rationality. For relations of these flows, see figure 1.

These different economic branches all accept such a precondition that the restrict condition of the efficient resource allocation is the quantity and liability of the information that market players receive. Therefore, the individual behavior is efficient if we may design good institutions to meet this precondition.

5. Conclusion

Price discovery is the dynamic process in which buyers and sellers interact, reach a certain price and make a deal at some time and place.

Through free competition, the market may tend to be in equilibrium. The value of competition lies in its being a discovery process, a process of common ideas formation. The competitive market process is a process to use scattered information to discover an efficient market price.

The mechanism design theory studied the distinction between good and bad market mechanisms, and the innovation of the economic system, which is especially instructive to developing and transitory economies. The viewpoints and analytical methods presented by the mechanism design theory may help developing countries to solve certain problems met at their economic reforms.

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Notes

Note 1. For more details, see Say, J. B. (1803). *A treatise on political economy or the production, distribution, and consumption of wealth.* Translated by C. R. Prinsep, M.A. (from the fourth edition of the French). Ontario: Batoche Books, 2001(new American edition), pp. 35-38, 58-59, 161.

Note 2. Hayek, the theorist of free market, published a series of papers analyzing social order, government policies, and market operation in 1973, 1973 and 1979 respectively, and put forward viewpoints on market mechanism which are quite different from those drawn form the static general equilibrium analyzing method.

Note 3. For more details, please refer to Mill, J. S. (1848). *The Principles of political economy with some of their applications to social philosophy* (Chinese edition). Translated by Rongqian Zhao, Bingyan Sang, etc. Beijing: The Commercial Press, 1991, Vol. II, pp. 270-276.

Note 4. See Say, J. B. (1803). *A Treatise on Political Economy or The production, Distribution, and Consumption of Wealth.* Translated by C. R. Prinsep, M.A. (from the fourth edition of the French), Ontario: Batoche Books, 2001(new American edition). pp. 159.

Note 5. Please refer to Mill, J. S. (1848). *The Principles of political economy with some of their applications to social philosophy* (Chinese edition). Translated by Rongqian Zhao, Bingyan Sang, etc. Beijing: The Commercial Press, 1991, Vol. II, 366-571.

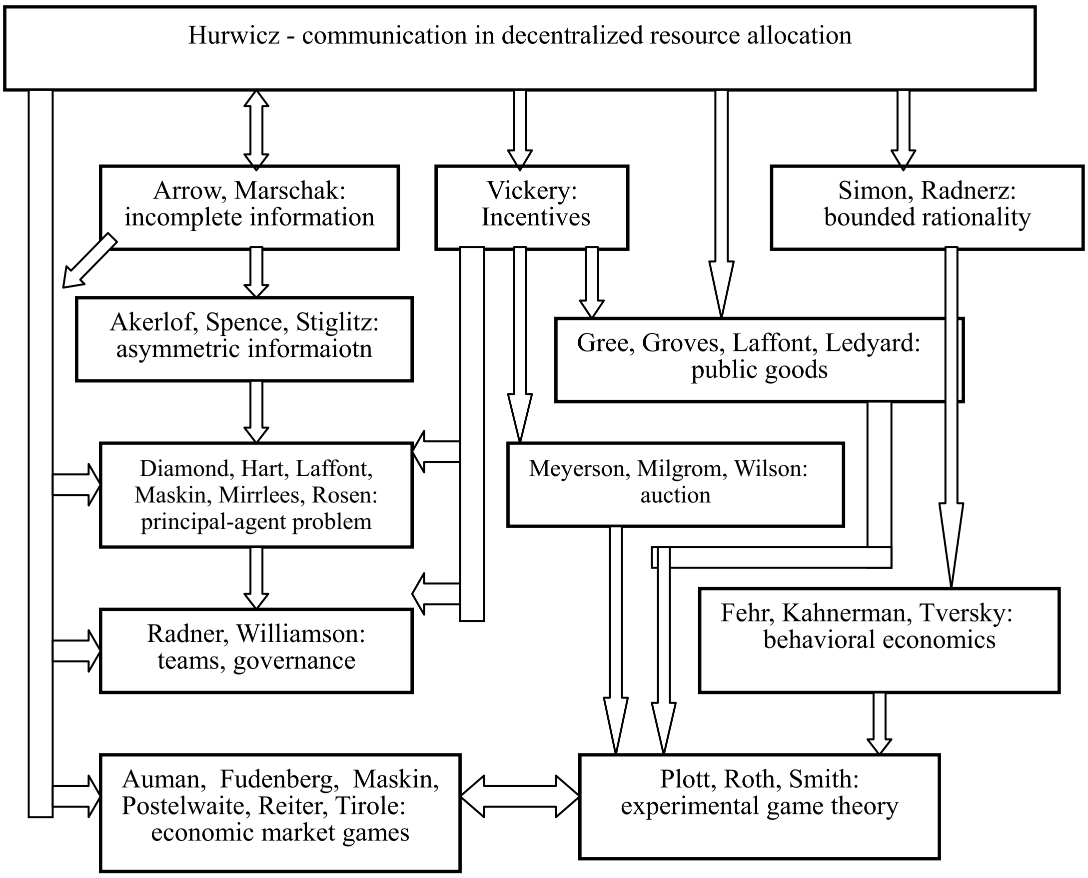

Figure 1. Mechanism design: different schools of research

Source: McFadden (2007).