Market Distortion and the Tuition Pricing Mechanism

of Higher Education in China

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Abstract

Higher education in the market economy is inevitable affected by the higher education market. The tuition of higher education in china had become the personal price performance of higher education in certain degrees and exerts some certain functions of price mechanism. Because the higher education market distortion that tuition pricing cannot completely become market behaviour.Tuition pricing had been affected by some factors such as the externality of higher education, the monopoly of higher education resources, the demand of higher education had lack elasticity, the information among the market main part are asymmetric and the price regulation of government. Therefore it is a practical choose for the tuition pricing at present stage that government should effectively intervene the higher education market and supervise the tuition of higher education.

Keywords: Higher education, Tuition, Market distortion, Public sector pricing

1. Introduction

Higher education is a kind of typical to-be public product. And tuition, the cost compensation to the private benefit from higher education, plays the role of price mechanism to allotment of higher education resource under market economy. On the one hand, tuition can optimize the allotment of higher education resource and accelerate education development. On the other hand, tuition is affected by higher education market, non-market and other factors. The tuition pricing mechanism can't be complete market behavior in china. Among those conflicts and factors, what principle and method can be used to determine tuition pricing is one of difficulties for research on the theory of educational economy and policy making on tuition for the government.

2. The ideal model for tuition pricing mechanism of higher education under the condition of market economy

The modern higher education often has natural relationship that can't be partitioned easily with market economy. Though the influences of market mechanism in various periods, countries and regions are different to higher education, the effect always exists in the mode of running, management and operation mechanism of a college.

As the fee paid by students or their families to colleges for service on higher education under the market economy, tuition is partly regarded as the price students or their families pay for private benefit. Besides it is an instant measure for the cost compensation to the personal benefit in higher education, it is partly the price of educational product when

the individual clients (students or their families) of service on higher education and the suppliers (colleges) negotiate.

The ideal mode of tuition pricing of higher education is based on the hypothesis that there are no external factors which will affect the tuition pricing of higher education. Its basic thought for pricing is the partition of benefit of higher education decides that of cost of higher education, that is to say, the principle for tuition pricing is how much tuition will be used to make up educational cost is determined by how much the benefits are after the educates accept higher education, As shows in Figure 1.

In the Figure 1, there are four assumptions. Firstly, the benefit from higher education can be divided accurately. One part is social, and the other is personal. In terms of the principle of benefit obtaining, the basic requirement of the theory of cost compensation on higher education, the governments and individuals should pay for the cost of higher education according to the proportion of the benefit they enjoy. Secondly, the cost of higher education is scientific, reasonable and can be measured accurately. As a result, we can calculate the sum of education cost that individuals and the governments should be responsible for respectively exactly by the standard of benefit proportion. The governments as the representative of public interest shoulder the education cost they should pay by the way of financial allowance. Thirdly, individuals can choose education opportunity in the wholly competitive educational market in light of their expected benefit. Tuition is the very compensation for educational cost of educates for their benefits. Fourthly, higher education market is totally open and competitive. In the ideal mode of tuition pricing, the tuition of higher education is shaped by the free purchase of the higher education consumers in the market. It means that services for higher education provided by different suppliers are the same. The monopoly of education resources doesn't exist, and there are plenty of consumers and higher education suppliers in the market. During the process of purchasing educational service, two sides of the deal possess complete information.

Only in the ideal mode of tuition pricing of higher education, the tuition of higher education is regarded as the cost compensation of the individual benefit from higher education which is a kind of to-be public product. This is in accordance with the basic requirement of the theory of cost sharing on education and that of public product pricing. It is the most effective tuition generating under the condition of ideal market.

3. The influence of market distortion to tuition pricing mechanism of higher education

In fact, the market in which higher education lies always deviates the ideal condition mentioned above and the market itself is not perfect enough, the ideal hypothesis of tuition pricing of higher education will fail. It mainly shows in the aspects as following:

3.1 The Benefit from Higher Education Can't Be Divided Precisely and the Risk of Personal Benefit

The benefit from higher education includes personal one and social one. Personal benefit mainly shows by the improvement of social civilization and increasing of social fortune. Generally speaking, individual civilization always affects and promotes the social one. The increasing of personal income will result in that of general social fortune. Therefore, personal benefit and social benefit can't be divided precisely.

Educates pay the tuition for obtaining future benefit. However, the private benefit has certain risk on education and will affect the individual choice for opportunity on higher education. And as the dominant part of individual investment on higher education, tuition will influence individual to decide whether he will take part in higher education or not, what kind of college he will be enrolled, what major he will take, and other issues to great extent. Because the tuitions of colleges are on different levels and the preferences for individuals to risk are various too, those who are prefer to risk will choose colleges with higher tuition and those who avoid risk will choose colleges with lower tuition. The risk of educational benefit means that the relationship between education investment and benefit is not a linetype. The failure of education investment probably leads to excessive education.

3.2 The Conflict between Supply and Demand of Higher Education and Demand Are Inflexible

There is a phenomenon of market distortion on higher education: demand increases endlessly and supply is relatively inadequate. The demands for higher education come from the society (governments and enterprises) and the private (students). The demand of modern society for individual civilization and quality is higher and higher. The demand for higher education is always infinite. The more supply on higher education the better. On the other hand, higher education is a kind of expensive product. The effect supply of higher education, that is, the capability for market to provide the scale, amount and quality of higher education is affected by the investment of educational resource and the educational cost. The insufficient effective investment of higher education and expensive educational cost will cause the relative deficiency of supply of higher education.

The flexibility of education demand reflects how much the influence of tuition to education demand is. Though the demand flexibility of groups with different levels of incomes to higher education is various, the education demands of families with salaries on high or medium level are lack of flexibility or inflexible generally. That of families with lower income may be stronger. However, the demand flexibility of higher education is weaker or more inflexible compared

with other common merchandises.

If according to the price mechanism completely, tuition is supposed to be the balanced price of private demand for higher education and education supply. But, because the demand for higher education is limitless, inflexible, and the supply of it is relatively insufficient, the price function of tuition is limited in a long term and leads to education equity and other social problems even tuition can halt the increasing demand on education effectively in a short term, we can balance the supply and demand of higher education and optimize the allotment of educational resource by making use of the price function of tuition. As a result, the governments can't depend on tuition pricing to adjust the supply and demand of higher education absolutely; they should interfere higher education market, supervise tuition pricing and guarantee education equity.

3.3 The Highly Insufficiency and Monopoly of Higher Education Resource

Higher education resources are quite rare. These resources, including teaching staff with high quality, academic status, majors and subjects, experimental devices, fame, etc, especially excellent ones are always controlled by a few universities.

Yet the occupancy and shape of such resources can't come true in a short period. It maybe will take hundreds, even thousands of years. Once the status is settled, it is hard to change in a short time. Thus, higher education resources are of natural monopoly. The resources of colleges and majors are unable to compare with each other. Colleges owning resources with high quality obtain benefits from monopoly by their monopolized positions, while tuition, the price after the co-effect of private demand and education supply, its level probably is continuous high. In the end, the optimizing of higher education resources allotment is difficult to come true, and it may cause the loss of social welfare.

The ideal market environment condition requests that the market is completely competitive. Only under this condition can the price mechanism be effective. Monopoly leads to the break of market definitely. The price of higher education which takes shape under the monopoly is higher than the balanced price under completely competitive condition undoubtedly. It will cause the loss of social welfare, lower efficiency of education resources and the damage to education equity. In such market environment, tuition loses its function foundation for adjusting price. So it is defective to only depend on the market to decide tuition, the price of private demand for higher education.

3.4 The Highly Insufficiency and Monopoly of Higher Education Resource

Information of higher education easily for the independence of colleges and the specialty of the teaching process. If the governments don't set strict regulations on the declaration of educational information, tuition pricing of higher education will be the game of blind boxing.

The dissymmetry of educational information shows in four aspects. Firstly, the information on the price, quality, cost and efficiency of educational service provided by colleges gained by the direct beneficent of education, students and their families and information of labor market are not correct. Secondly, the information of educational cost, educational quality, majors and comprehensive quantity of students owned by enterprises are not complete. Thirdly, as the representative of public interest, the governments can't control the information on the supply and demand of higher education, internal operation and cost of colleges totally. Fourthly, the information on demands and competition of colleges in the market are asymmetrical too.

If tuition is regarded as the price education consumers pay for the service on higher education, it needs in accordance with the cost and quality of educational service it provides. But the dissymmetry of educational information causes the ineffectiveness of tuition mechanism based on cost pricing directly, and the mass will have doubt on the standard for tuition level.

In the same way, the dissymmetry of relative educational information owned by main bodies in higher education market will also make the standard for tuition deviate the objective level. For example, the information possessed by students and colleges is dissymmetrical. Students don't know well about the scientific research strength, the quality of teaching staff, software and hardware environment for teaching. Some colleges just make use of such dissymmetry to get higher tuition and gain unrighteous benefit. Therefore, the dissymmetry of information about higher education market decides that tuition pricing of higher education depends on non-market factors, such as governments, social agencies to build up the mechanism for declaration of higher education information to strengthen the necessity of supervision on tuition.

4. The less-optimized tuition pricing mechanism of higher education under the condition of market distortion

In terms of the theory of public pricing, the best way for pricing of public products that are in the ideal market environment (totally competitive market and information is complete) is the rule of pricing on margin cost, that is to say, price on the margin cost will lead to the maximum of social welfare. If higher education as a kind of to-be public product exists in the distorted market, monopoly on educational resources and incomplete market information make the price of higher education deviate its margin cost. Thus, tuition pricing can't be carried on according to the rule of pricing on margin cost but less-optimized pricing instead.

4.1 The Less-optimized Mode for Tuition pricing mechanism

The mode of Ramsey (1927) was used to do research on the optimized tax theory in an early time. It has been applied on the issue of pricing for industries with natural monopoly to explain how to adjust the pricing on margin cost effectively since the 1970's. In this article, the authors attempt to study how to make tuition pricing to enable colleges to get the maximum social welfare under the balanced condition on the basis of the model and take the influence of higher education market distortion to tuition pricing into consideration.

Supposing the colleges with monopoly provide n items of educational services, the prices are $(p_1, p_2, \cdots, p_n)$. It means that educational services with different academic standards and majors will be paid by different tuitions. The welfare functions for educates are $Z(p_1, p_2, \cdots, p_n)$; The surplus Functions of colleges (the part income is more than outcome are $\pi(p_1, p_2, \cdots, p_n)$. Under the condition of distortion of higher education market, the goal for tuition pricing is to fulfill the maximum of general welfare of educates when colleges with monopoly obtain certain surplus K. Therefore, the issue of optimizing can be transferred to seek the maximum of Lagrange Function.

$$L = \begin{matrix} \max \\ (p_1, p_2, \cdots, p_n, \lambda) \end{matrix} Z(p_1, p_2, \cdots, p_n) + \lambda(K - \pi(p_1, p_2, \cdots, p_n)) \tag{1}$$

λ is gene of Lagrange, when seeking deflect to Z, we can get:

$$\frac{\partial Z}{\partial p_i} = \lambda \frac{\partial \pi}{\partial p_i}; i = 1, 2, \cdots, n \tag{2}$$

Form (2) means that the margin benefits of educates and that of colleges are proportional. According to the Hicks Theory, the change of consumers benefit caused by changes on price is equal to the decreasing consuming quantity. That is:

$$\frac{\partial Z}{\partial p_i} = -x_i \tag{3}$$

If we ask local derivation to price by the surplus function of colleges, it is:

$$\frac{\partial \pi}{\partial p_i} = (MR_i - MC_i)\frac{\partial x_i}{\partial p_i} \tag{4}$$

In addition, supposing the flexibility of across price for all kinds of major education is zero, and then the margin benefit of colleges is:

$$MR_i = p_i + x_i \frac{\partial p_i}{\partial x_i} \tag{5}$$

Put form (3), (4) and (5) into form (2), we can get:

$$\frac{p_i - MC_i}{p_i} = \frac{1 + \lambda}{\lambda \varepsilon_i} \tag{6}$$

In the form, ε_i is flexibility of demand on price. Form (6) is the less-optimized price Model Ramsey to higher education tuition under market distortion. The pricing strategy requires each price on higher education service and the deviation of its margin cost are varied inversely as the flexibility of demand on the price of educational service. Under the condition of satisfying the surplus restriction in colleges, the economic distortion caused by the deviation price to margin cost is minimum. Generally we set $a = (1 + \lambda)/\lambda$, call α as the value of Ramsey, the common expression of price is:

$$p_i = \frac{MC_i}{1 - \alpha/\varepsilon_i} \tag{7}$$

Supposing that various values of Ramsey are used on different educatees from families with different level of income in this model, they show the different welfare weights of different educatees in the general welfare function. Because the value of Ramsey is a real number between 0 and 1, the bigger welfare weight given to certain kind of educatees equals the smaller value of Ramsey in Equation (6).

The demand flexibilities for higher education of higher education consumers are dissimilar due to their different incomes level. As a result, to families with higher or medium level of income, higher education is necessity, the demand flexibility is much smaller, the price of higher education they should pay can be obviously higher than margin cost without plenty of efficiency loss. On the contrary, to poorer families with low income, higher education is such a kind of luxury, the demand flexibility is much larger. A large amount of loss on efficiency will be involved in the policy for pricing. Most of them will be excluded from the higher education system.

In summary, under the condition of distortion of higher education market, tuition pricing should consider education

equity, the efficiency for resource allotment and other issues. So we can draw following conclusions according to the analysis on tuition pricing under the monopoly of educational resources by the Ramsey model: to families with income on high or medium level, tuition higher than the margin cost will be charged. To families with income on low level, tuition lower than the margin cost will be charged. It means different levels of tuition will be charged according to different income level. Such pricing policies will minimum the loss of educational resource and maximum the comprehensive welfare of educatees.

4.2 The Limitation of the Less-optimized Model for Tuition Price Mechanism

After analyzing with the model of Ramsey, we can get the less-optimized model for tuition pricing under the monopoly on educational resources. The pricing model has some limitation considering the real situation of higher education market. Firstly, educational cost is hard to be measured precisely. We don't have a set of scientific measure system for educational cost yet. The accurate measure for margin cost is even harder. Secondly, it is difficult for us to tell the income level of the educatees' family. It is hard to charge different tuitions according to various income levels on operation. The last, the model just takes the distortion of higher education market and verified demand flexibility for education into consideration. Therefore, only the coordination of market mechanism and government is in full play, the model of less-optimized pricing can play the best role.

5. Countermeasures to improve the tuition sub-optimal pricing mechanism under market distortion

The distorting factors of higher education market have certain impact on tuition pricing, but the current pricing mechanism of Chinese higher education tuition has not yet fully considered the market-distorting factors, and itself is not a sound mechanism. So in order to rectify the market-distorting factors and improve the tuition sub-optimal pricing mechanism of higher education, we can explore this issue from the aspects of market and government:

5.1 Combine Independent Pricing of School and Uniform Pricing Mechanism of Government

The product provided by higher education is a kind of educational service, while different colleges and universities in china, as the suppliers of such service, will provide differential products, which is mainly demonstrated in the differences of educational concepts of schools, academic levels of education, majors, curriculums and faculty, etc. Apparently, the unified tuition standard established by the government will become invalid due to the discrepancies of schools. In the market-oriented tuition pricing model, colleges and universities are treated as the micro-bodies of educational services, and they independently decide the price of their products, i.e. the price of educational services according to the Market demand and supply. From the experience of current policy reform of foreign higher education tuition, we can see that colleges and universities are gradually obtaining the autonomy of tuition pricing. For example, according to the current U.S. policy of higher education tuition, both public and private schools possess the right to constitute their tuition standards. Meanwhile, the provision that "if the tuition fee exceeds a" cap ", the government will reduce the funding accordingly." is applicable to public colleges. Since the implementation of higher education reform in 2003, the reform of tuition system in Britain is the most significant. Ever since 2006, the British government has abolished the unified tuition standard, which means differential tuition pricing, but the nation has also set up an upper boundary of tuition standard (the annual tuition fee for each student shall not exceed 3,000 pounds) to restrict the independent pricing of universities.

Independent tuition pricing in china can make the impact of tuition price mechanism on the efficiency of education resource allocation to a greater extent, so that the quality of higher education services becomes the key point of the competition among colleges and universities. Namely, the level of tuition not only reflects people's pursuit of quality education products, but also reflects the quality of higher education products. Consequently, in such a market, colleges and universities will keep strengthening their sense of competition, make full use of resources to improve the quality of higher education products, reduce the cost of education products, expanding the competition among colleges and universities, and further the effective functioning of the market mechanism of higher education.

5.2 Corrective Actions Taken by Market & Government Intervention on Tuition Pricing

Though market mechanism in china affects the tuition pricing of higher education, the tuition pricing should be a public pricing behavior under the guidance of government because of its externalism and publicity.

Firstly, increase higher education input, boost education supply and release demand pressure. A major factor of higher education market distortion in china is the imbalance between supply and demand. The demand increases fast while the supply is relatively limited. The main source of higher education input includes educational appropriations from the State, tuition and other investment from the society. As the representative of public interests, the government should expand educational fund, improve condition of schooling and regulate the balance between supply and demand of higher education market.

Secondly, accelerate the competition among institutions of higher education. Under the condition of monopoly, institutions of higher education may make use of the monopoly situation to charge tuition unfairly (the so called

"arbitrary collection of fees") so as to gain monopoly income. Therefore, government should not only regulate the tuition pricing rigidly, but also shatter the monopoly and expand the competition among institutions of higher education.

Thirdly, innovate in the mode of running a school, encourage the development of private schools, and stimulate the higher education market. Private schools could increase the higher education supply. Moreover, comparing with public schools, private schools have more market vitality, including competition pressure, cost-consciousness and quality-mindedness. It is a helpful enlightenment for us that many high qualified higher education resources center on private schools. The government should provide private schools sound system and environment and make them share the equal policies with public schools so as to guide public welfare fund transferring to private schools.

Fourthly, improve the disclosure system of educational information and establish system for disclosing educational costs, quality and tuition. According to the theory of information transmission, information always transfers from intensive part to sparse part. It is certain that the superior one is not willing to share its information with the society gratuitously so as to keep a favorable position in asymmetric information. However, as public organizations in china, the institutions of higher education use the public resources, so it should be compulsory for them to make schooling information known to the public. At present, one reason why the educational information is not complete is that institutions of higher education have not established the disclosure system of higher educational information yet. As a result, the society takes up on the schooling activities of higher education and tuition pricing of government. The government should perfect the legal system and ensure that the public could get the information about educational costs, quality and tuition through certain channels. Meanwhile, the government should establish hearing system of tuition pricing and public the basis of tuition pricing.

Fifthly, establish endowment and security systems for students which match tuition pricing in china. Many factors of higher education market malfunction leads to the malfunction of higher education tuition pricing system. Meanwhile, it may lead to over-priced tuition or more "poor students" (i.e. the matter of equal educational opportunities and fairness doctrine). It is obvious that reliance on market forces to solve these problems will further expand the educational inequalities. Therefore, the government in china could take the following steps for relieving the unfairness: establish and improve social security system of higher education; ensure that everyone has the right to receive education; establish and perfect the state loan system; improve the tuition subsidy system for poor students, increase opportunities for such students to participate in work-study program; establish and improve the state system of higher education scholarships and grants; charge different groups of students with different tuition standards,etc.

To sum up, in order to perfect the sub-optimal pricing mechanism of higher education tuition in china, it is necessary to consider the role market mechanism plays, at the same time, the government should strengthen the supervision of tuition fees, rectify the distortions of higher education market, reduce the negative impact of distorting factors on the function of the tuition price, and give full play to the function of higher education tuition fees on optimizing the allocation of higher education resources and realizing educational equality.

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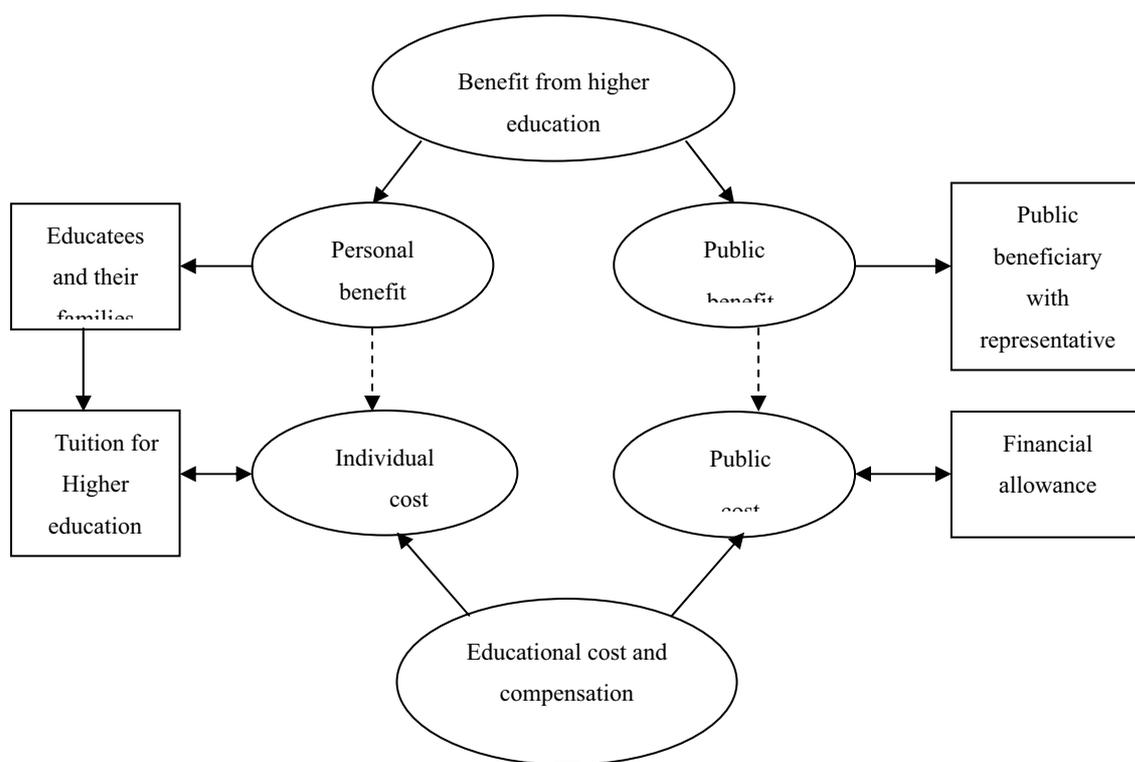
Figure 1. The Basic Thought of the Ideal Mode for Tuition Pricing of Higher Education