

A Study on University's Scale Economy From the Perspective of Average Develop Cost Per Student

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Abstract

Since 1999, China's advanced education has experienced more than ten years of leap-forward developments. While enrollment keeps increasing, it is under question that whether colleges have achieved scaled economies under existing resources. In this paper, we analyzed the relationship between development cost per students and college scaled economics in perspective of average development cost per students. In addition, forming mechanism of scaled economy is illustrated, as well as strategy to achieve it.

Key words: Colleges; Scaled economy; Develop cost per student

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INTRODUCTION

Since 1999, China's advanced education has experienced more than ten years of leap-forward developments. Enrollment increased from 1.6 million in 1999 to 7 million in 2015, which are 4.38 folds of increase. During waves of enrollment expansion and mergence, record for

college scale keeps been refreshed. Almost every single college has enlarged scale. However, competition for larger scale by merging is blind and disordered. Therefore it is theoretical and practical to discuss college scaled economy with limited educational resources.

1. DEVELOP COST PER STUDENT AND SCALED ECONOMY

Development cost per student and scaled economy refers to cost of a standard student (PhD, master, undergraduate student, vocational student are transferred to standard student according to certain standards), that is the ratio of education cost to standard student. Marginal cost is the amount of money a student will incur when it reaches a predetermined number of students. Relationship between marginal cost and development cost per student is illustrated in Figure 1.

From Figure 1 it is obvious that college development cost per student is a comprehensive standard, which combines development cost per student, marginal cost and college scale comprehensively. Colleges and universities spend resources to produce educational products—students, which are the object of colleges and universities funding. However, educational product is different from the industrial product. Schools provide education as a service which enhances students' knowledge and skills (Jiang & Yue, 2010; Feng, 2013). Scaled economy refers to relationship between scale and cost. Therefore with given technology, for one certain product, if the average cost in a production range is increasing or decreasing, we consider the existence of scaled economy. Thus college scaled economy refers to relationship between the number of standard student and development cost per student, which gives it some properties.

(a) Long development period. Comparing with developing student, most of industrial products have

short producing period and fast cash transportation. The development of students is a gradual process, which needs

a relatively long time, such as graduate students need three years, undergraduate students need four years.

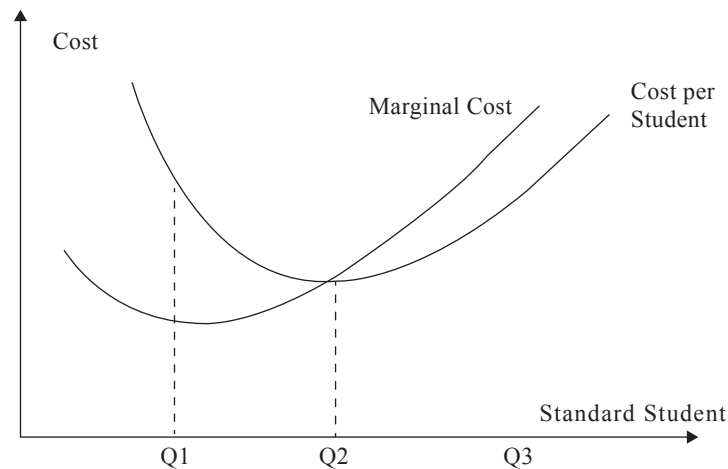


Figure 1
Relationship Between Develop Cost Per Student and Marginal Cost

(b) Classification according to department and major. Colleges will spend identical costs on developing a student in the same department and major in the same period. However, it is different in different department or major, especially between art and science. Only to calculate based on department and major separately, it is possible to make an accurate calculation annual cost for majors, total cost per talent and development cost per student.

(c) More shared costs than direct cost (Feng, 2013). Advanced education is a coordinate work which needs cooperation from every department and units. Therefore teaching, tutoring, administration and logistics costs should be accounted correspondingly to object cost.

2. MECHANISM OF FORMING SCALED COLLEGE ECONOMY

While college scale is increasing, cost per student is decaying. This is called “scaled economy”. In the case of colleges, scaled economy is determined by indivisibility of production factor, labor and social division of labor and management specialization, as well as the increasing exchange of knowledge and transaction cost savings.

2.1 Indivisibility of Production Factor

In discussing scaled economy, the indivisibility of fixed assets was noted relatively early. In the view of the short period, expanding the scale of operation and increasing production will only increase the cost of change, fixed costs are unchanged. This equates to a reduction in the fixed cost per share of the output, and an increase in profits. Therefore, while the scale is expanded, the profit is not proportionally increasing. This non-linearity is the scaled economy. During development of theory, people have gradually relaxed assumptions, for example expanding resource to entrepreneur, having noticed

indivisibility of entrepreneurs’ talent. That is when the scale of business is increased, fixed asset is also increased. However, if entrepreneurs’ talent is not increased in a short period of time, efficiency of newly increased assets is enhanced. In addition, this needs only entrepreneur without any additional investment. Thus it is able to gain same scaled economic effect as unchanged fixed assets.

In case of college, no matter what the size it is, it must contain classroom, dorms, teaching equipment, library and other product factor with at least one smallest unit unless the college is not able to operate, especially for some teaching equipment, experiment equipment and facilities that are professional and irreplaceable. In order to maintain teaching quality, those inputs are necessary. When college is in small size, input factor is not loaded efficiently, as well as resource, which leads to high cost per student (Jiang, 2013; Lu & Chen, 2015). If college plans to enlarge enrollment in recent, direct cost, such as power, fuel, materials and consumption fees for teaching and research, will increase. However, there are also indivisible costs such as classroom, equipment and books in the library that are not increased. Those unchanged indivisible input factors result decreasing cost per student and increasing efficiency from expanding college size and enrollment. When size is enlarged, increased ratio of students is larger than input ratio, this nonlinearity is scaled economy.

2.2 Social Division and Management Specialization

Education, especially higher education, is a very small division of labor (Zhang, 2016). The knowledge structure of teachers in colleges and universities is very professional, and it is difficult for the teachers in different specialities, even teachers in the same profession, to replace each other. School size is too small, likely to cause

each professional scale to be too small. In the teaching process, on one hand, if the teacher is only engaged in the teaching of the professional work, the workload is not saturated, and the teaching efficiency is low, resulting in waste of human resources. On the other hand, the teacher establishment of small-scale school is usually limited. In order to meet all the professional or curriculum needs, teachers often have to serve as the director of the profession or take the teaching of the curriculum. In the absence of re-learning or training, the teachers' teaching "lump sum" will lead to a decline in the quality of teaching. Under the premise that the technical means of higher education has not changed greatly, and without changing the specialty setting of higher education and without affecting the quality of teaching, the scale of the school will be enlarged and the teacher-to-student ratio will be improved. At the same time, the scale of the school will increase, the teacher establishment will also be increased, and the hiring of teachers will be more flexible. The school will make arrangements for teachers according to different professional and curriculum, making a reasonable division of professional teaching and teaching contact specialization is more conducive to improve the quality of teaching.

2.3 Increasing Returns to Knowledge Exchange and Transaction Cost Saving

As the place for knowledge production and dissemination, knowledge exchange in universities happens much more than the general industrial enterprises, and it is more important, as well. From the perspective of knowledge complementation and knowledge sharing, the scale of higher education is often accompanied by the increase in the number of specialities and the integration between disciplines. This tendency is more apparent after the merging of schools. Professional increase and discipline integration have two aspects of "increasing returns" effect (Feng, 2013). On one hand, the exchange of knowledge between teachers of different professions and disciplines has increased, which has helped to improve the teaching level and scientific level of every teacher. Teaching and research are the two main tasks of universities. On the other hand, it is the "synergy effect". Students can be in a large-scale, with complete subjects, talented schools through the monasteries, contact and learn from each other, to accept more information and are subject to the influence of more disciplines. In today's society, the compound talents are more and more favored by the employing units, and the expansion of students' knowledge is particularly important. In the process of knowledge exchange, knowledge is embodied as one of the most obvious features of information—increasing returns, that is, in the process of knowledge exchange, each person's existing stock of knowledge is not reduced. On the contrary, he also has received knowledge from the others, and even may be able to invent knowledge that none of them have known before during the process.

Nowadays, with the professional and disciplinary division and cross-trend becomes increasingly evident, the significance of knowledge exchange also rises.

3. COUNTERMEASURES FOR COMPLYING UNIVERSITIES' ECONOMIES OF SCALE

(a) Universities need to accelerate the integration of existing resources to achieve the economies of scale with the existing resources. We can find that the economies of scale caused by indivisibility are essentially the "arrows of time" and are the problems of long-term and short-term contracts. Institutions of higher learning as an organization can also be viewed as a collection of contracts. Through these contracts, the behavioral space of each concerned party is limited in its choice, which, in some respects, leads to consistent behaviors and achieves the organization's goal. After the expansion of enrollment in situations of higher education, through short-term contracts, some inputs and expenditures can be changed temporarily, such as electricity, water and so on. There are other inputs, which schools are either reluctant to change in the short term or it cannot be changed in the short term, maintaining a long-term contract. In the presence of a long-term contract, post performance (such as number of teachers and classrooms) will affect the current operating system. The performances of the economies of scale are to achieve the integration of existing resources without changing the long-term investment.

(b) Universities need to accelerate the organization form innovation and management specialization, giving full play to the potential of management resources. From the perspective of school administration, small-scale schools have the apparent characteristics of "institutionalized homogeneity" in social organizations, that is, despite the small scale, various types of corresponding administrative departments still need to be established. This makes the management range too narrow, the administrative efficiency too low, student management costs too high. In additions, it is affected by the establishment restrictions. Small-scale school administrators are generally part-time teachers, affecting their teaching and research work. With the expansion of the school scale, the school will often employ specialized personnel to carry out administrative work, use more advanced forms of organizations, add many fixed procedures and administrative regulations, in order to achieve professional management functions and bring savings on management.

(c) Universities need to actively build platform for sharing knowledge and strengthen the construction of the teaching team. Knowledge has a certain degree of public goods nature, together with information asymmetry, opportunistic behavior and the existence of uncertain factors, making transactions difficult under the market

price mechanism or the costs are too high, leading to the “market failure” phenomenon. Expanding the scale of universities can promote the internationalization of knowledge transfer and save external transaction costs. This is one of the reasons for the formation of economies of scale. For some colleges and universities, the economic benefits brought about by knowledge transaction cost savings may exceed the parts of material equipment indivisibility. The merging of colleges and universities, especially the margin of some colleges with strong professional complementarity, is particularly effective.

(d) Universities need to highlight the development of key majors and subjects in order to avoid being complete but empty. From the perspective of cost-per-student, the cost of training varies from department to department. Meanwhile, there are different economies of scale in the existing educational resources. Colleges and universities need to recruit students from their own resources, taking full of their advantages, avoiding being complete but empty. Otherwise, they not only fail to follow the economic principle, but also are not in line with the universities’ ideas of scientific development, resulting in bloated intuitions and waste of talents.

CONCLUSION

In this paper, we analyzed the relationship between cost-per-student, the marginal costs and the economy of scale

from an economic perspective of view. We also analyzed the mechanism of the formation of the scale economy in colleges and universities, providing countermeasures of implementation of the economic scale of the university from the cost-per-student perspective, which provides the basis for decisions on the investment of higher education, analysis of economic benefit and determination of students’ scale.

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