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Tanaka, Yasuhide

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On the Equity Aspect of the 'Quasi-Market' in Educational Services: The Case of the North-West Region in England

by

YASUHIDE TANAKA

Faculty of Economics, Kobe University

Rokko, Nada, Kobe 657-8501, Japan

Fax: +81-78-803-6803

E-mail: tanaka@econ.kobe-u.ac.jp

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ABSTRACT

This paper considers the equity aspect of the educational reform in English secondary education. By using data from the *School Performance Tables* in the North West region of England, two indices of equity measurement, the 'dissimilarity index' and the Gini coefficient, are calculated. From the results, it is found out that the disparity between schools in the region has not been a serious problem so far.

JEL classification: I21, I28

Keywords: secondary education, education reform, quasi-market, equity

I. INTRODUCTION

The purpose of this paper is to consider the equity aspect of the educational reform in English secondary education. English educational system had been changed drastically by the Education Reform Act 1988 (ERA1988), although some scholars named it as an introduction of the 'quasi-market' into the educational services (see, for example, Le Grand (1991), Glennerster (1991)). Since then, there have been many research studies about the effects of the 'quasi-market' forces on the efficiency aspect in the education system of England.[1]

Glennerster (2002) has recently reviewed school performances during 5 years from 1995 by using test score data published by the Department of Employment and Skill (DfES) and has stated that "(s)pending stagnated but output grew in a way unseen for 30 years. It could be called a 'productivity explosion'" (Glennerster (2002, p. 129)). That the 'quasi-market' has contributed to the improvement of efficiency has been found not only in descriptive analyses but also in empirical ones. For example, Bradley et al. (2000) have tested the education production function using data from the *School Performance Table* in the period 1993 to 1998 to examine the efficiency improvement of the secondary education sector brought about by the 'quasi-market' forces.

However, as Glennerster (1991) has stated, there are two forms of competition arising from the introduction of the 'quasi-market' forces into the educational services, that is, efficiency competition ('E' competition) and 'selection competition' ('S' competition). The latter competition can be regarded as an equity problem of the educational services and the 'cream-skimming' problem is one of the popular problems in such competition.

Until now, the efficiency competition of the 'quasi-market' has been studied so often and we have learned from those research studies that the 'quasi-market' forces have made an improvement in the efficiency of the English educational sector. On the other hand, it seems that quantitative analyses about the problem of 'selection competition' from the introduction of the 'quasi-market' are few, compared with the analysis of efficiency problem.[2] In this paper, therefore, we will consider this equity aspect of the educational services by using the 'dissimilarity index' and the Gini coefficient.

The rest of this paper is structured as follows. In the next section, we will explain the two equity indices used in this study, that is, the 'dissimilarity index' and the Gini coefficient. The data used in this paper and their quantitative analysis will be discussed in the third section. The fourth section concludes the paper.

Ⅱ. METHODOLOGY

In this section, we will explain the methods to examine whether the disparity between schools has become larger or not by the introduction of the 'quasi-market' into the educational services. Here, we will apply two measurements to calculate the disparity of the secondary educational sectors. One is the 'dissimilarity index' used by Rumberger and Willms (1992, Appendix) and the other is the more popular index for income distribution, the Gini coefficient.[3]

The 'dissimilarity index' is expressed as follows:

$$(1) \qquad D_t = \frac{\sum_{i=1}^{n} NS_{it}\left|p_{it} - \overline{p}_t\right|}{2NS_t\overline{p}_t\left(1-\overline{p}_t\right)},$$

where NS_{it} is the number of pupils aged 15 years old in school i at time t, NS_t is the total number of pupils aged 15 years old at time t, p_{it} is the proportion of pupils

obtaining 5 or more 'General Certificate of Secondary Education (GCSE)' at grades A* to C in school i at time t, $\overline{p}_t$ is the arithmetic mean of the proportion of pupils obtaining 5 or more GCSE at grades A* to C in each school at time t and n is the number of schools. A high value for this index implies that there is large disparity between schools.

In order to calculate the Gini coefficient, we rank each school in order from the lowest proportion of pupils obtaining 5 or more GCSE at grades A* to C to the highest proportion along the horizontal axis. Then we calculate the relative weight of pupils aged 15 years old in each school divided by the total number of pupils so that we can measure the percentage of the total number of pupils aged 15 years old along the horizontal axis. On the other hand, we measure the percentage of the proportion of pupils obtaining 5 or more GCSE at grades A* to C from the lowest (0 %) to the highest (100 %) along the vertical axis. From these data, we can now depict the Lorenz curve, and the Gini coefficient (G_t) at time t is measured by

$$G_t = \frac{2A_t}{B_t} \quad , \tag{2}$$

where A_t is the area surrounded by the Lorenz curve and the 45 degree straight line at time t and B_t is the area of the square formed by the total percentages of pupil and the proportion of pupils obtaining 5 or more GCSE at grades A* to C at the same year (Atkinson (1983, p. 53)).[4] The higher the value of the Gini coefficient, the larger the disparity between schools is.

Ⅲ. THE DATA AND ANALYSIS

Data from the *School Performance Tables* are used to calculate the 'dissimilarity index' and the Gini coefficient. The *School Perfomance Tables* show the number of 15 year-old pupils, the proportion of pupils obtaining 5 or more GCSE at grades A* to C,

the proportion of pupils obtaining 5 or more GCSE at grades A* to G, and so on in each school. Here, we will use GCSE data in the secondary schools which belong to 22 Local Education Authority (LEA) in the North West region of England.[5] The periods considered are three recent years, that is, 1997, 1999 and 2001. By considering these three years, we can examine the recent changes on the equity aspect brought about by the introduction of the 'quasi-market' forces into the educational sectors.

The data from the *School Performance Tables* are, however, not exactly the same during these three years because, for example, some schools have changed their name, or new schools have been opened. Therefore, we have chosen the data to be used in this study based on the following conditions. First, the data set we will use includes the schools which are maintained by LEA and whose pupils are not selected. Second, all special schools maintained by LEA are excluded. We have excluded selective schools and special schools from our data set because the inclusion of these schools would distort the statistical analysis by the extreme ranges of the ability. Third, the independent schools whose pupils are not selected are included in the data set. Fourth, we have chosen such schools that the data of the school are available for the three years considered here. Even if the school name has been changed during these years, we have selected each school by considering its address and telephone number, and the schools confirmed as the same as before were included in the data set. Based on these qualifications, the total number of schools considered here are 451. The number of schools in each LEA is shown in the Appendix.

Table 1 reports the values of the equity indices calculated by the 'dissimilarity index' and the Gini coefficient. The 'dissimilarity index' has increased slightly in 1999 but it has decreased by a relatively large amount in 2001. On the other hand, the Gini coefficient has decreased consistently during these three years, although its value has experienced large decrease from 1997 to 1999. From these results, we can conclude

that the disparity between schools arising from the introduction of the 'quasi-market'

Table 1: The trend of the changes on equity indices

Year	1997	1999	2001
'Dissimilarity Index'	0.278	0.279	0.274
Gini Coefficient	0.223	0.212	0.211

forces has not been a serious problem at least in the North West region of England. The results obtained in this paper have, therefore, directly provided one of the statistical evidences that support the view of Bradley and Taylor (2002).

Ⅳ. CONCLUDING REMARKS

In this paper we have examined the equity aspect of the educational reform in England by using the 'dissimilarity index' and the Gini coefficient. The results obtained here are that the disparity between schools, or cream-skimming problem, in the North West region of England has not been a serious problem so far and that the introduction of the 'quasi-market' forces into the educational services has been successful at least in the region considered here.

The following two remarks must be considered in future study. First, the results obtained in this paper have been derived from the data of one particular region of England so that we must confirm the results by considering the data for the entire nation. Second, although the equity indices considered here have been shown to decrease from 1997 to 2001, one thing must be noted: the U.K. government has introduced the new system called as 'Education Action Zones' in September of 1998. We have known from the results here that the 'dissimilarity index' in 2001 has

decreased more and that the Gini coefficient has also decreased by a large amount from 0.223 in 1997 to 0.212 in 1999. Therefore, some of the improvement of equity shown here might have been contributed by this policy change.

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Footnotes

1 See, for example, Bradley and Taylor (1998, 2002), Bradley et al. (2000), Bradley et al. (2001), Glennerster (2002), Taylor and Bradley (2000).

2 The analysis by Bradley and Taylor (2002) is one of the exceptions among the quantitative analyses of the equity aspect. However, even this study does not consider the direct estimation of equity problem. They have used the proportion of pupils eligible for free school meals as an index of equity, and have stated that "the adverse effects on equity appear to be relatively small in magnitude" (Bradley and Taylor (2002, p. 311)). Of course, there are many research studies which consider the equity problem in a descriptive way. About those analyses, see, for example, Glennerster(1991) and Bartlett (1993).

3 Vandenberghe (1998) has used the 'dissimilarity index' to examine the effect of the 'quasi-market' on educational services in Belgium.

4 The Gini coefficient is formally defined as following. "(T)he Gini coefficient is defined as half of the arithmetic average of the absolute differences between all pairs of (e.g.) incomes (y), the total then being normalized on mean income (m): $G = \frac{1}{2n^2 m}\sum_{i=1}^{n}\sum_{j=1}^{n}\left|y^i - y^j\right|$" (Barr (1998, p. 151)).

5 The author expresses many thanks to HMSO for granting permission to reproduce the data in the *School Performance Tables*.

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U.K. Department for Education and Skill (2001) *School Performance Table.*

Appendix: LEA in the North West region and the number of Schools

	Name of the Local Education Authority	Number of Schools
1	Blackburn with Darwen	10
2	Blackpool	6
3	Bolton	19
4	Bury	14
5	Cheshire	44
6	Cumbria	30
7	Halton	7
8	Knowsley	11
9	Lancashire	88
10	Liverpool	32
11	Manchester	20
12	Oldham	15
13	Rochdale	15
14	Salford	12
15	Sefton	22
16	St Helens	12
17	Stockport	18
18	Tameside	17
19	Trafford	10
20	Warrington	11
21	Wigan	20
22	Wirral	18
	Total	451