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LOCAL OR REGIONAL? COST–BENEFIT ANALYSIS OF A HYPOTHETICAL NEW STRUCTURE IN PUBLIC PRIMARY EDUCATION IN HUNGARY

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Local governments are responsible for the provision of primary education in Hungary, this being the largest expenditure item in their budget. The segmented structure of Hungarian local government may be a source of inefficiencies, since one of the most important source of inefficiencies is diseconomies of scale. This paper, using data of two counties – Baranya and Békés – presents a cost–benefit calculation with respect to the operational costs of a hypothetical, newly structured primary education system, where only institutions of "optimal (efficient) size" are operated. Two scenarios are presented. According to the first one all schools of inefficient size would be closed down, while according to the second this could happen only if there is at least one additional social/cultural institution in the settlement in question. The results of the simulation, being rough calculations, may provide guidance on what kind of questions might occur and what the approximate magnitudes of expenditures of a new system might be under specific conditions of reorganisation.

Keywords: public financing, economics of scale, primary education

JEL classification index: I122, R59, H52

Foreword to the paper of Anita Papp

By publishing the following posthumous paper, we would like to commemorate the tragically short scholarly career of our student and friend, Anita Papp (1969–2000). Her open-hearted, hard-working, brave and loving person will remain etched in the memory of everyone who knew her; that needs no such commemoration. Our aim with this publication is different: we want to mark that her death deprived Hungarian social science of a highly promising young scholar.

The proposal for her dissertation, in which she planned to formally modelise and meticulously test hypotheses about the different ways in which Hungarian municipalities and institutions under their control reacted to central fiscal restrictions, especially the Bokros-shock, and which she submitted to the Political Science Department of Central European University a mere five months before her death, was one of the most accomplished, best prepared and most interesting thesis proposals ever presented to the Department.

The essay published here was prepared for the course *Public Policy of Education* at CEU in the spring of 2000. We are certain that she would not have thought of publishing the paper (the best of the class) without carefully considering feedback from many teachers and peers, and incorporating

the points made by them to strengthen the argument and extend her references. On re-reading it, however, we decided that the paper was strong enough to be published *as it is*[1], and this way we serve our purpose better: beyond considering the merits of what follows as a highly interesting contribution to a topical policy debate, we ask the Reader to also consider what further contributions could have been expected of someone who handed in such a paper to fulfil the essay requirement of a one-semester course during the second year of her uncompleted PhD studies. We are certain she would concur that her memory as a young scholar would be best served if others, perhaps inspired by this paper, went on studying the issues she discusses here.

Júlia Varga – Balázs Váradi

INTRODUCTION

According to the National Accounts for Hungary, education represented approximately 5% of GDP by consumption in 1994–1995 (CSO, 1994; 1995). Education expenditures amounted on average to 8.5% of consolidated general government expenditures between 1992 and 1997 (Ministry of Finance, 1992–1997). Pre-primary, primary and secondary education together made up 3.7% of consolidated general government expenditures in the same period.

As the above numbers indicate, primary education is a major component of public expenditures in Hungary. Provision of that public service is legally assigned to local governments (Act on Local Governments, 1990). Currently, state (local government) provision dominates over private provision in Hungary. This arrangement implies that the present structure and changes in the local government systems (for example the size of localities) directly influence the institutional structure of primary education (World Bank, 1999).

As a result of the political liberalisation process at the start of the 1990s, each of the 3200 settlements in Hungary acquired its own local government. In addition, local governments, independently of their size, are equally responsible for a large number of services ranging from maintenance of local roads to solid waste disposal, public lighting, primary education, primary health care and so on. The average population size of localities is around 3000 citizens, the number of settlements having less then 1000 inhabitants is 1670. While the political independence and political equality of settlements could be seen as a desirable principle for a democratic society, equality in service assignments raises some concerns.

First, as a consequence of the large number of small local governments and the extensive number of tasks they must perform, the public service delivery sys-

[1] Except for painstaking proof-reading by Carol Harrington, for which we express our heartfelt gratitude.

tem, and within that the system of primary education, is too fragmented. Two thirds of the local governments have their own schools, and the number of schools where the total numbers of pupils is below 100 is 670, that is one fifth of the total number of schools in 1996. Small schools might have lower educational quality due to the fact that pupils of different age are taught in the same class.

Second, the fragmented structure of primary education makes its operation costly and the system could be characterised by allocative inefficiencies (World Bank, 1999). The average size of schools by settlements was between 4 and 1,045 pupils in the country in 1996, the smallest being in a village in Vas county, and the largest in a small town in Hajdu-Bihar county. The second smallest school in the country in 1996 employed 2 teachers for five children. Per pupil unit costs by size of schools indicate that there are economies of scales in primary education in Hungary (*Table 1*), nevertheless, these are not utilised under the current structure of service provision.

Addressing the issue of costly operation has been on the agenda of consecutive governments in Hungary during the 1990s. Attempts have been made to find an efficient structure for primary education: the most efficient size of schools, and their sufficient number. These papers usually focused on the optimal size of institutions, and looked at possible costs savings, but did not take into account the total costs of a potential new system including its indirect costs (Ministry of Finance, 1996).

This paper aims at presenting a basic cost–benefit calculation with respect to the operational costs of a hypothetical newly structured primary education system, where institutions of "optimal" size are operated only and indirect costs (transportation) of the new system are also taken into account. In the first version of the calculations all schools below a benchmark size should be closed and relocated to the capital of the respective small region. In the second version, the community-building externalities of schools are also taken into account, and institutions are merged only if there is at least another type of social–cultural institute at the settlement which adequately substitutes for schools.

The paper concentrates on one year and two counties only. The reason for the latter is that information on small regions is very limited in the database used. Although using average data from a time series could have provided more reliable information on operational costs, the consideration of using as recent data as possible also had to be accommodated. The compromise has been to make calculations only for the year 1996.

THEORETICAL BACKGROUND

The concept of economies of scales states that when an increase in output by a constant of (k) does not result in a k-times increase in total costs of production, then economies of scale exist and production is more cost-efficient if output is produced in large quantities. When this basic principle is applied to education, the question is whether it would be more cost efficient to produce more outputs in the existing units of education, or alternatively, whether there is a better structure of the school system so that the same amount of children could be educated from less resources.

It is important to note that efficiency in this interpretation refers to cost efficiency only. Nevertheless, it is not obvious that large school size accompanied with low per capita expenditures is a proof of efficiency if not only output quantity but quality also matters. This question is addressed in the literature as the problem of output of public services. Pupils are not only outputs but they represent input also to education. Accordingly, the output of education largely depends on the characteristics of this key input (abilities, pre-existing skills), and it is difficult to grasp what the output of the education process exactly is. To solve this problem, the concept of intermediary output is often used whereby input, for example the number of pupils enrolled, is used for approximating output (Cohn et al., 1989). Education in this approach is more efficient the bigger number of pupils are educated from a fixed amount of resources.

With respect to economies of scales in primary education in Hungary, this paper utilises the existing literature, and takes findings of recent empirical analyses as its starting point. *Table 1* below indicates that in settlements where the average size of schools is bigger, the unit costs of education are lower. Herman et al. (1998) have found proof for this negative correlation. They have estimated impacts of pupil numbers on the unit costs of education (returns to educational population scale) by using the overall number of pupils at a settlement and the average number of pupils in a school. The first figure represented the size of the local educational sector while the latter one stood for the possible returns to scale at the school level. They found that the overall number of pupils had significant effect on the unit-cost expenditures in education both in towns and villages, while the average number of pupils had significant effect on educational costs only in villages. The authors claim that returns to scale are highest in the lower range of pupil numbers: average costs of education decline tremendously in the range of 500–2,000 pupils per school.

There are two normative policy implications of the findings on economies of scales. On the one hand, it seems worthwhile to increase the demand side of the local educational market. On the other hand, with respect to the supply side, it is

cost-efficient to educate pupils in schools sized between 500 and 2,000 children. The rest of the paper tries to establish an optimal-sized market with optimal-sized institutions and investigates whether unit costs of education would indeed be smaller.

Table 1

Operational expenditures per pupil and distribution of primary schools by size (1996)

Average number of pupils	Average per pupil costs 1000 HUF	Number of settlements	Number of schools
0 – 49	120.5	365	380
50 – 99	123.1	282	294
100 – 149	107.1	407	412
150 – 199	94.2	306	327
200 – 249	90.1	206	224
250 – 299	89.2	137	157
300 – 349	88.8	87	130
350 – 399	86.0	88	204
400 – 449	91.7	82	414
450 – 499	90.4	57	288
500 – 549	87.5	53	202
550 – 559	84.7	41	136
600 – 649	79.1	25	55
650 – 699	79.9	14	31
700 – 749	70.9	7	10
750 – 799	77.3	11	12
800 – 849	81.4	9	13
850 – 899	78.2	7	9
900 – 949	77.0	3	3
950 – 999	73.7	3	3
1000 –	80.8	1	1
Total	102.3	2191	3305

Source: TÁKISZ Database.

Demand: optimal local educational market

Using the findings of Herman et al. (1998) that the overall size of the educational sector has an effect on unit costs in both towns and villages, this paper assumes that the hypothetical new educational structure is based on a sufficiently sized local educational market. To obtain a sufficiently large educational market, demand is taken into account not at the level of small regions, but at the level of individual local governments.

There are several arguments for treating small regions as the appropriate units of the local educational market. First, small regions are not only administrative units, but the results of symbiotic development of towns and settlements in their immediate environment. Hence, locating educational services in the capital of small regions does not seem to contradict urban development. Second, geographical relocation of services does not seem to be unmanageable from a transportation point of view. There were 160 small regions in 1996, in a country of a size of 93,000 square kilometres. As a rough approximation, no small region capital is further away than 13.6 kilometres from the edge of a small region on average[2].

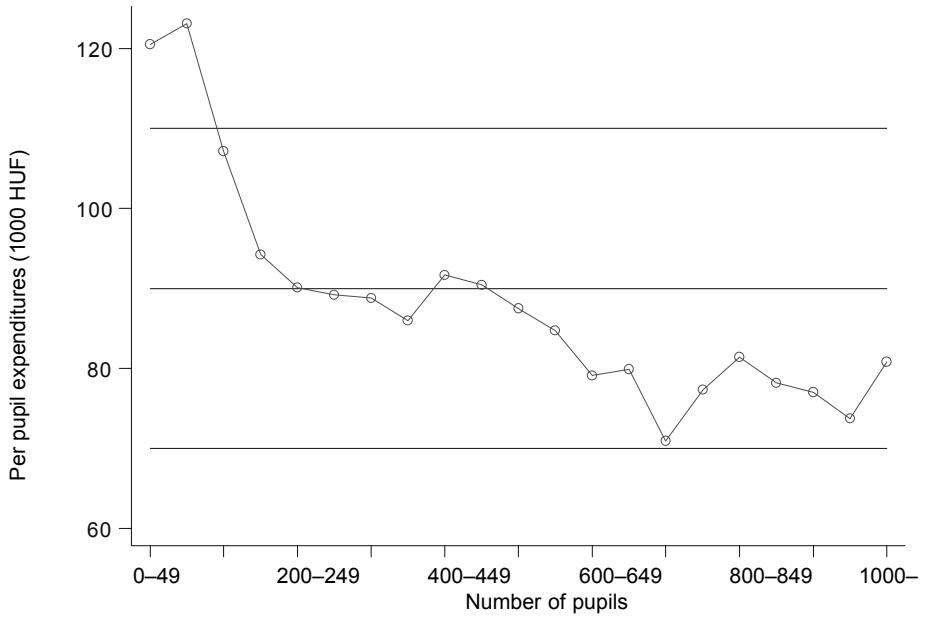
Supply: optimal size of schools

Regarding cost efficiency of the educational institutes, Herman et al. (1998) claim that while average costs decline continuously with increasing numbers of pupils, the decline is the most dramatic in the range of 500–2,000 pupils. Accordingly, this paper ideally assumes that the hypothetical educational system would consist of schools with 2,000 pupils in the capital of small regions, and operational costs of these schools would be the proxies for the operational expenditures of the hypothetical new system.

Nevertheless, the dataset does not provide information on the size of individual schools, only on the total number of schools and the total number of pupils at a given settlement, that is the average size of schools. Due to data constraints, it is not obvious what size of schools should be used as a reference for the hypothetical new system. The only guidance is that size should be within the range of 500 and 2,000. A possible option would be to rely on schools with the highest average number of children. However, it is crucial to note that looking at the average size of institutions per settlements, and using per pupil operational expenditures as proxies for the costs of the hypothetical new system might be distortive. There might be settlements with a few highly cost-efficient big schools and a good number of less efficient smaller schools which might show up in the dataset as settlements with average-sized schools and cost-efficient education. The dataset will have a bias towards showing settlements with only one school and relatively big number of pupils to be cost-efficient, because the equalising impact of making averages is not prevalent. At the same time, it tends to hide truly cost-efficient institutions in the middle range.

Per pupil expenditures by average size of primary schools have been lowest in institutions with an average number of 700 students (see figure below).

[2] The average size of small regions is 581 square kilometres. Assuming that each region has a shape of a circle, the average distance from the middle point of the circle is 13.6 km.



Nevertheless, regarding averages, this information cannot directly be used as a benchmark for schools with the lowest operational costs. The benchmark school size has to be characteristic for schools in the entire low-cost range, that is, average schools size of 700 or above. Among settlements with at least 700 pupils per school on average, settlements with schools sized between 800–850 occupied the median place. The number of settlements with an average school size smaller than 800–850, but bigger than 700, was 18, while the number of those above 850 was 14. Hence the paper assumes that schools in the range of 700 pupils or above are best characterised by schools with a number of 800–850 pupils and the benchmark school has 825 students. It is important to note that no primary school has to be of a size of 825, but the system shall be designed with a reference to that school size.

COST–BENEFIT ANALYSIS: THE BASIC FRAMEWORK

A cost–benefit analysis of the operation of a hypothetical new system is based on the following simple logic. In a system with optimal- (efficient-)size schools, economies of scales are utilised, that is, the operational expenditures of the new system are smaller than those of the fragmented system.

Due to the fact that the new hypothetical system would consist of big schools at the capital of small regions, some of the small, inefficient schools would be closed down and some pupils would have to commute in order to get to school. Recurrent costs due to changes in location (that is pupils' transportation costs) would be taken into account as an integral part of the total operational expenditures of the new system. In sum, the following relationship will be investigated to identify operational cost efficiency of a hypothetical new system:

operational cost (old) < = > operational cost (new) + cost of transportation

Restrictions

The simple formulation of the question above contains several implicit restrictions with regard to implementation costs of the hypothetical new system and the transportation market. On the one hand, it is assumed that there is an adequate infrastructure in the country to accommodate increases in transportation, and that there is a flexible transportation market from the supply side, so that higher needs for transportation would not result in an increase in costs of transportation.

As far as the costs of introducing the new educational system is concerned (e.g. extra class rooms to be built), it is assumed for the sake of this paper that the general government is ready to bear the cost of restructuring the institutional system and no economic viability in the strict sense is expected: the costs of one-time expenditures are financed from resources external to the hypothetical education project. This could be either an operational surplus in other public services, revenues from operating or selling assets or, finally, issuing new debt. While possibly no rational private agent would implement a project which is unable to finance itself, that is, to generate revenues which also cover investment costs, a government might have several reasons to do so.

First, the government faces a decision-making problem of investing into a service which produces public good (Lott, 1987). It could be argued that primary education is a good which not only provides individuals with knowledge, but also contributes to the acquisition of basic knowledge and skills necessary for the smooth operation of democratic societies. Such basic social skills and the resulting well-functioning system is a public good, characterised by non-excludability and non-rivalry. As a consequence of the non-excludable nature of the public goods, there is an inherent free-rider problem: it is difficult to make beneficiaries bear the costs of education. As a result, public goods are usually underprovided if their production is left only to the market (Stiglitz, 1988). The gov-

ernment might intervene and make arrangements for additional educational service provision either by financing education, or by directly producing education in state institutions, but cannot expect that the system would finance itself.

Other arguments can be brought up for why governments would not require an education project to cover its investments costs. Unlike in case of other market actors, governments can get indebted in order to finance their already existing debt. If debt financing moves on a sustainable path, whereby costs of debt grow in line with the capacity of the government to finance debt (increasing revenues), the government might want to choose a strategy to roll over its debt continuously. This would result in permanent interest expenditures, but would not require the repayment of the capital. Hence, the costs of a government investment would be considered only insofar as they would result in an increase of interest expenditures of the government.

Data sources

The cost–benefit calculations of this paper are based on the so-called TÁKISZ database on local governments. While this is a very rich dataset providing monetary and other information on local services, two major problems hindered its use. On the one hand, the available data set does not contain information by small regions. Information of counties and individual settlements is obtainable only. Second, while the database is extremely large, it is far from being coherent, hence the amount of data to be omitted is large.

Due to the above considerations, instead of looking at the costs and benefits of the hypothetical education system in small regions nationwide, small regions of only two counties out of the 19 have been selected, assuming that the new education system is only in a pilot phase. The selection of the two counties was determined by the relative goodness (fullness) of data, and representativeness for settlement density.

As has been argued above, that fragmentation, and hence high costs of public services at the local level are due to the fact that each settlement has its separate local government with an equal number of tasks independently of size. Accordingly, settlement density seems to be a factor determining the costs of education services in a given part of the country. One of the counties selected (Baranya) represents parts of the country with high settlement density, that is, a large number of small individual settlements. The other selected county (Békés) is characteristic for parts of the country with low settlement density and relatively large individual settlements by number of citizens *(Table 2)*.

Table 2

Number of settlements, and number of settlements with primary schools in selected small regions (1996)

Small regions	Number of settlements	Number of settlements with schools	Number of schools
Baranya county	*302*	*106*	*183*
Small region			
Komló	19	9	15
Mohács	48	19	22
Pécs	69	26	60
Pécsvárad	13	7	8
Sásd	27	5	37
Sellye	30	11	11
Siklós	50	12	13
Szigetvár	46	17	17
Békés county	*75*	*72*	*111*
Small region			
Békéscsaba	17	17	41
Mezőkovácsháza	19	17	18
Orosháza	10	10	17
Sarkad	11	10	11
Szarvas	7	7	11
Szeghalom	11	11	12

Source: TÁKISZ Database.

Characteristics of the old structure

The main characteristics of the old structure are summarised in *Table 3*. Per capita operational expenditures varied from 80,000 HUF to 101,000 HUF in Baranya county, and from 73,000 HUF to 96,000 HUF in Békés county in 1996. The average school size by small region was rather small, it varied between 109 and 300 in Baranya and 231 and 416 pupils per school in Békés. 183 schools operated in the 106 settlements of Baranya, and 111 schools in the 72 settlements of Békés. The effects of settlement density is clearly observable: both the number of schools, and per capita expenditures are higher in Baranya, a densely settled part of the country, than in Békés.

In the two selected counties (and 14 small regions), the average size of schools varied between 109 and 416 in the small regions of Sellye and Szeghalom, respectively. This implies that reorganisations would be necessary at the capital of

Table 3

Main features of the existing primary educational system in 1996

Small regions	Number of schools	Number of pupils	Average number of pupils per school	Operational expenditures (1000 HUF)	Average operational expenditures per pupil, HUF
Baranya county	*183*	*3570*	*236*	*4 082 468*	*114 291*
Small region					
Komló	15	4205	280	337 930	80 364
Mohács	22	4532	206	431 769	95 282
Pécs	60	17 991	300	1 809 574	100 585
Pécsvárad	8	1012	127	87 006	85 974
Sásd	37	8737	236	111 289	88 102
Sellye	11	1198	109	121 033	101 071
Siklós	13	2770	213	264 045	95 323
Szigetvár	17	2758	162	261 412	94 800
Békés county	*111*	*37 616*	*339*	*3 251 988*	*86 453*
Small region					
Békéscsaba	41	15 372	375	1 364 938	88 797
Mezőkovácsháza	18	4697	261	453 180	96 493
Orosháza	17	6094	358	506 622	83 135
Sarkad	11	2542	231	230 585	90 728
Szarvas	11	3920	356	328 537	83 821
Szeghalom	12	4993	416	368 126	73 736

Source: TÁKISZ Database, file-in-kind data on institutions.

every small region in order to create optimally sized schools. As it can be seen in *Table 3*, per pupil operational expenditures are well above the cost-efficient level in the small regions selected for this analysis, except for the small region of Szeghalom, which fact indicates that a new structure could be expected to bring significant increases in cost-efficiency.

Full merger: A hypothetical new system

According to the basic framework outlined above, the operational costs of education in the old structure in a given small region are supposed to be compared to the total operational expenditures in the same small region under the new arrangement. Education would be provided in the headquarters of small regions only, in schools with a benchmark size of 825. Total operational expenditures incorporate transportation costs as well.

Schools of the new system may diverge from the benchmark-sized school, but it is assumed that no school below a size of 700 children and above 1,400 is allowed to operate. Accordingly, school size is flexibly altered upwards (but not beyond 1,400) or downwards (but never below 700) compared to the benchmark size of 825, if the number of children to be educated in schools is not an integer multiplier of 825.

With regard to operational costs, the reference per pupil operational expenditures is assumed to be 77,000 HUF per child, that is, average per capita operational expenditures in the range of cost-efficient school of 700 children or more. For schools bigger or smaller than the benchmark size, the average per capita operational expenditures are varying according to school size applied *(Table 1)*.

With respect to costs of transportation, it is assumed that only those pupils who live outside the capital of small regions have to commute. Transportation costs within the capital of a small region were not taken into account in any form, although the size of schools was increased in the capital towns, too. This assumption can be justified by the claim that capitals of small regions tend to be towns big enough for pupils to have to travel within the town under the old system as well. Total transportation costs for pupils outside the capital of small regions were calculated by multiplying the number of commuters by the cost of bus transportation for an average distance of 13.6 kilometres twice a day.

The new hypothetical school structure is summarised in *Table 4* below. The calculations show that the new system has lower operational costs even allowing for transportation costs. In general, transportation costs do not seem to significantly change total expenditures. As can be seen, cost-efficiency improvements of the new system are rather uneven depending on the original structure of educational service in a given small region.

According to the new structure, average schoolsize would vary between 841 and 1,256 pupils per school in Baranya county. The number of schools would be reduced to 42 from 183 in the county as a whole. In three of the small regions one school would be enough to cover the entire school-aged population of the small region. Per pupil operational expenditures, including transportation costs, would be within the range of 77,200 and 88,500 HUF, well below the expenditures under the old structure. Approximately half of the pupils would have to commute every day.

In line with the statement that settlement density in a county affects costs, Békés county shows different results. Average schools size in the small regions would vary between 832 and 980 pupils per school. The number of schools would be reduced to 45 from 111 in the county as a whole. Per capita operational expenditures would be between 73,900 and 81,600 HUF in the new system. More than half of the pupils would have to commute.

Table 4

Main features of the hypothetical new primary education system

Small region	Number of schools	Number of pupils per school (new)	Number of pupils in the capital of the small region	Number of commuting pupils	Operational costs (1000 HUF)	Transportation costs (1000 HUF)	Total operational costs (new) (1000 HUF)	Per pupil expenditures (HUF)	Difference (old-new) (1000 HUF)
Baranya county	*42*	*847*	*22 836*	*12 894*	*2 858 004*	*3610*	*2 861 614*	*80 112*	*562 444*
Komló	5	841	3026	1179	342 287	330	342 617	81 479	–4 687
Mohács	5	906	1980	2552	348 926	714	349 640	77 158	82 129
Pécs	21	857	14 189	3802	1 464 427	1064	1 465 491	81 459	344 083
Pécsvárad	1	1012	544	468	81 770	131	81 901	80 929	5 105
Sásd	1	1256	571	8166	98 219	192	98 411	78 353	12 878
Sellye	1	1198	472	4726	96 758	203	96 961	80 970	24 072
Siklós	3	923	849	1921	213 290	538	213 828	77 194	50 217
Szigetvár	3	919	1195	1563	212 328	438	212 765	77 159	48 647
Békés county	*45*	*836*	*13 837*	*23 779*	*2 942 367*	*6658*	*2 949 025*	*78 399*	*302 963*
Békéscsaba	18	854	6106	9266	1 202 051	2594	1 204 646	78 369	160 292
Mezőkovácsháza	5	939	766	3931	361 631	1101	362 731	77 234	90 419
Orosháza	7	871	2879	3215	476 511	900	477 451	78 348	29 171
Sarkad	3	847	1117	1425	206 878	399	207 277	81 557	23 308
Szarvas	4	980	1746	2174	288 867	609	289 476	73 855	39 061
Szeghalom	6	832	1223	3770	406 390	1055	407 445	81 611	–39 319

Source: TÁKISZ Database, file in-kind data on institutions.

It is important to note that the distance and costs of commuting are based on the same hypothesis both in case of Baranya and Békés. This is a simplification whereby small regions are approximated as equal sized circles covering the area of the country. At places with small settlement density these "circles" (small regions) are likely to be bigger, hence their radius is expected to be bigger. Pupils here are likely to have to commute more than the average. These considerations were not incorporated into the calculations.

Social cohesion perspectives: a modified hypothetical education system

A hypothetical new system based on cost efficiency is a rather simplified approach to restructuring the institutional system of public education. There is an often used sociological argument against school mergers which states that schools contribute to social cohesion at the local level. They link individual families, provide cultural events and enhance identity towards the locality. These non-monetary benefits should also be taken into account when education is supposed to be re-designed.

With respect to the above consideration, this paper assumes that school mergers make more harm than good, that is cost efficiency does not outweigh the reduction of social cohesion, if there are no other cultural–social organisations at the local level but the school. The paper investigates the operational costs of a modified hypothetical education structure where schools are closed down only if there is at least one additional cultural–social institution.

Looking at the number of cultural institutions would be the bent proxy for identifying whether there is a substitute for the school at the settlement. Nevertheless, information about these kinds of institutions was not available in any form. Alternatively it was assumed that the existence of day care for the elderly could be a potential substitute for schools with regard to social cohesion. This is because these institutions not only provide physical care, but they also organise cultural and social events, hence they contribute to community building in a similar fashion to schools.

The characteristics of a new educational system where schools are relocated to the capital of the small region only if there is no day care for the elderly at a settlement are presented in *Table 5*.

As the table shows the modified system has a significantly lower average school size, and larger number of schools but still would operate more cost-efficiently than the fragmented system. Cost savings would be smaller than in the non-modified hypothetical case presented previously. This is because the presently exist-

Table 5

Features of a modified hypothetical primary education system

	Number of schools	Average size of schools	Number of commuting pupils	Operational cost (1000 HUF)	Commuting costs (1000 HUF)	Total operational costs (1000 HUF)	Per pupil operational expenditures (HUF)	Savings = difference (old–new) (1000 HUF)
Baranya county	*104*	*415*	*4770*	*3 040 748*	*1336*	*3 041 790*	*85156*	*382 268*
Komló	10	421	1050	347 595	294	347 595	82 662	–9 665
Mohács	16	283	752	393 577	210	393 787	86 900	37 982
Pécs	36	500	1369	1 513 925	383	1 514 308	84 173	295 266
Pécsvárad	6	169	190	78 568	53	78 621	77 689	8 385
Sásd	2	628	488	106 755	137	106 892	85 105	4 397
Sellye	8	150	248	103 217	69	103 287	86 252	17 746
Siklós	11	252	422	246 954	118	247 072	89 196	16 973
Szigetvár	15	184	254	250 155	71	250 226	90 744	11 186
Békés county	*59*	*638*	*20 942*	*2 986 443*	*5864*	*2 992 307*	*79 550*	*259 681*
Békéscsaba	19	809	9243	1 201 978	2588	1 204 566	78 364	160 372
Mezőkovácsháza	10	470	3281	403 778	919	404 696	86 170	48 484
Orosháza	11	554	1873	462 385	524	462 910	75 962	43 712
Sarkad	5	508	1036	221 467	290	221 757	87 255	8 828
Szarvas	7	560	2022	313 463	566	314 029	80 120	14 508
Szeghalom	7	713	3488	383 372	977	384 349	76 985	–16 223

Source: TÁKISZ Database, 1996.

ing structure would be modified only moderately, particularly in the densely settled county of Baranya.

The average schoolsize in Baranya county would be smaller than in case of full mergers: the number of pupils would be between 150 and 628 under the modified hypothetical system. The number of schools would decline but not as significantly as under a full merger. Per pupil expenditures would vary between 77,700 and 90,800 HUF, considerably exceeding the corresponding sum of the full-merger case. The number of commuters would be significantly smaller, only 4800 out of 35,700.

Changes in Békés county would also be more moderate if compared to the full-merger case. Nevertheless, the full-merger and the modified hypothetical new system show less drastic differences than in the case of Baranya county since Békés county contains relatively bigger settlements with a number of institutionalised services. Hence, merging schools is not hindered by the lack of alternative social–cultural institutions which could overtake the community-forming role of schools. The average number of schools would vary between 407 and 890 under the modified new system. The number of schools would be 59 as opposed to 111 under the old system and 45 under the full-merger case. Per pupil expenditures would be higher than in the full-merger scale, but still lower than under the old system: costs would vary between 76,000 and 87,200 HUF. Commuters would still be substantial, 20,000 out of 37,600.

CONCLUSIONS

The results of the paper shall be treated as rough calculations rather than sophisticated computations based on advanced theoretical models. They only provide guidance on what kind of questions might arise and what the approximate magnitudes of expenditures of a new system might amount to under specific conditions of reorganisation.

First, changes in the structure of education cannot be justified on the basis of cost efficiency only. Improvement in the professional aspects of education together with some cost measures might provide a rationale for changes. The calculations show that cost efficiency could be increased if education were provided in a different structure. Assuming that the decline in operational costs in the two counties truly represents potential savings for the country as a whole, the decline in operational expenditures at the national level would be around 1.0 billion HUF.

Second, transportation costs do not seem to hinder rationalisation of the educational system. As a result of increased travel costs, total costs of education

would increase only by 0.14% compared to education expenditures under the old structure.

Third, according to the calculations, a fully merged system would not bring improvements in cost efficiency in every small region, though the counties as a whole showed significant improvements. This means that small regions could not be treated in the same way: where the structure of education is close to the benchmark efficiency, more harm than good could be done with reorganisation.

Fourth, if the impact of education on social cohesion are taken into account as well, a new system would only be slightly more efficient in those parts of the country where the structure is most fragmented. In this respect the entire purpose of a restructuring attempt could be questioned: potential economies of scales would be deliberately not utilised due to community-building considerations.

Fifth, making school mergers dependent on the existence of alternative social–cultural organisations might not be a sufficient condition for maintaining social cohesion. Other aspects, such as demographics should be taken into account, too. Where the relative number of children is high, the day care for the elderly might not be an adequate substitute for schools. If pupils commute, some families might find it worth moving to the capital of the small region, and the dynamics of the process might lead to devastation of social cohesion as in case of full merger.

REFERENCES

Act on Local Governments (1990): 1990/65.

CSO (1994, 1995): *National Accounts for Hungary*. Budapest: Central Statistical Office.

Cohn, E. – Rhine, Sh. L. – Santos, M. C. (1989): Institutions of Higher Education as Multi-Product Firms: Economies of Scale and Scope. *Review of Economics and Statistics,* 71 (2): 284–290.

Herman, Z. – Horváth, T. M. – Péteri, G. – Ungvári, G. (1998): *Allocation of Local Functions: Criteria and Conditions.* (Paper prepared for the Hungary-Sub-national Development Program: National Workshop for Policy Dialogue, June 30, 1998).

Lott, J. R. Jr. (1987): Why is Education Publicly Provided? A Critical Survey. *Cato Journal* 7(2): 475–501.

Ministry of Finance (1992–1997): *Government Financial Statistics*. Budapest: Ministry of Finance.

Ministry of Finance (1996): *Public Finance Reform Strategy*, Manuscript.

Stiglitz, J. (1988): Public Goods and Publicly Provided Private Goods. In: *Economics of the Public Sector.* New York: Norton.

The World Bank (1999): *Sub-national Development Program.* Washington, D.C.