

FOCJ AS MODEL FOR FINANCING THE ESTONIAN GENERAL EDUCATION¹

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Abstract

The share of GDP used for financing education in Estonia is somewhat lower in comparison to the EU average, the nominal amount of per capita education funds is much more lower due to a low level of economic development. Moreover, because of thin population per square km many small schools exist in Estonia without a sufficient number of pupils, which makes the education system more costly. We consider two different basic strategies to improve the situation.

The current strategy of financing Estonian general education refers mainly to the prevailing educational and spatial organization. This strategy is not based on a fair equal treatment of cases. Therefore a new strategy of improvement of education financing system is discussed. It is based on the idea of Functional Overlapping Competitive Jurisdictions (FOCJ). The municipalities voluntarily form FOCJ that are operating schools. In this way municipalities may form a school jurisdiction that can negotiate with central government institutions for the loan and the school equipment etc. A municipality can act individually or the FOCJ negotiates for the municipal members in total. Theories of FOCJ-establishment, FOCJ-contribution determination and FOCJ-negotiations with central government are demonstrated. The FOCJ can supplement positively the first strategy of reform.

Keywords: funding of education, central government budget policy, local governments finance

JEL Classification: H52, I22

Introduction

The funding of school education has become a complicated issue for the public sector (Aaronson 1999; Nechyba 2003) and for securing the financial sustainability of general education schools (Downes 2001; Murray *et al.* 1999) especially under conditions of reduction of population.

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Therefore, this article deals with changes and adaptations of spending schedules for general education in the regions of Estonia³. The following research questions are formulated:

- What are the actual conditions of school finance in Estonia?
- What reform approaches exist?
- May the introduction of FOCJ improve the reform results?

The article consists of four parts. The first part analyses the starting points of the financial reform in Estonian general education. The second part presents the FOCJ model to organize financing of general education. The third part analysis the institutional conditions of introducing the FOCJ in Estonia.

1. The situation of the general education funding in Estonia

The nominal amount of Estonian per capita education funds turns out low⁴. Estonia has many small schools with an insufficient number of pupils, which makes the education system costly. The reform planned for 2005-2006 aimed at increasing the level of investments in the learning environment of schools and the funds for educational expenses, as well as at introducing higher transparency into the system. There are a number of problems hindering the implementation of the reform, increasing risks and questioning the need for several changes.

In the funding of educational investments, the central government has planned to be in the role of a long-term loan and construction service provider via state owned real estate firm (RKAS – Riigi Kinnisvara AS) from one side to achieve the economy of scale both on financial and construction market. From another side, the investment component was allocated to municipalities from the state budget as part of the per capita funds for financing the necessary school investments. The reform comprises the transition from the political distribution of investments to a funding scheme based on the number of pupils in the municipality and investment allowance per pupil.

But the reform was actually interrupted. The institutions of EU have included RKAS to state institutions and it loans to state budget deficit. As result the central government has lost interest to support the school-investments of municipalities through loans of RKAS and the implementation of the school-investment program “Schools in Order” in RKAS passed away. In years 2005-2009 13 new schools were

³ The article uses the information of the Ministry of Education and Research about the educational funds. Funds for school operation get allocated proportionally to the number of pupils in particular schools (per capita funding, or the so-called capitation fee) between 2001 and 2007. Investment funds are provided through the State Investments program to municipal general education institutions between 1996 and 2004. Statistical data educational on expenditures of EUROSTAT are used as well.

⁴ In the period 1996-2008 in Estonia the GDP grows 4.42 times, but the funding of general education increases only 3.67 times.

built up and 19 old school buildings reconstructed. Total investments amount 1.1 billion EEK, including 0.9 billion EEK for municipality schools. (RKAS 2011)

From municipality side the development trends of the state-allocated investment component was not fixed. The growth of the investment component should be tied to GDP growth to enable the financing of long-term investment projects besides the savings from exploitation costs as a result of investment in school buildings. The changes in the funding scheme were dramatic and vary to a great extent from school to school and also from county to county. The new system has eliminated several bottlenecks, but it ignores the volume of investments made so far, differing needs in investment, and differences between the financial capacities of municipalities. The initial level of investment component was not sufficient, but was for stronger municipalities a stimulus to mobilize own resources too for the investments in improvement of the teaching-learning environment in schools.

During the economic and fiscal crisis the central government investment support (investment component of general education funding) was declined drastically in year 2009 (by 77% in comparison to year 2008 from 2010 EEK to 468 EEK per pupil) and stayed on this very low level in years 2010 (528 EEK) and 2011 (495 EEK) (Estonian Ministry of Finance homepage). In addition, because of general essential declining of budget revenues the stronger municipalities too do not have more financial resources for new investments. Many participants of RKAS school loan-construction program “Schools in Order” have serious difficulties to service their rental (credit) obligations. RKAS has to face high risks, especial risk managements methods are worked out (RKAS 2011).

According to the new rules of funding schools’ current educational expenses for 2008, the coefficients for the re-calculation of the funds reflecting pupils’ numbers per municipality have been dropped. In order to take into account the needs of small schools, schools will be financed depending on the number of classes in them. If a school is recognized as regionally important, it is reckoned that teachers have to do their work regardless of the size of the classes. For schools with undersize classes, the so-called base fee (75% of the capitation fee) will be allocated for each pupil falling short of the set standard minimum class size.

An advantage of the new funding system concerns the switch from the municipality related scheme to a school-related scheme. Until now, municipalities with several regionally important schools were at a disadvantage compared to those with only one school on their administrative territory. The combination of per capita and base fee aims at finding a single applicable funding scheme for all schools that would consider the differences in the numbers of pupils and classes at different schools (Riigikogu kultuurikomisjon 2005). The regional effect of the transition to the new funding scheme is illustrated by figure 1 presenting the allocation of state funds to general education schools in different counties of Estonia in 2008.

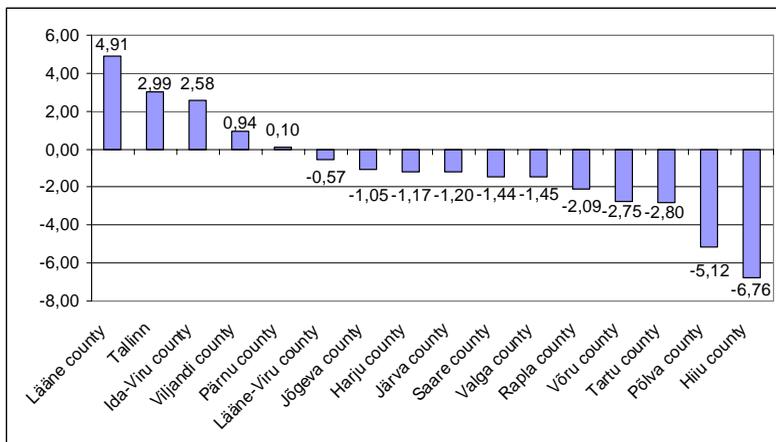


Figure 1. The impact of introducing new funding model on current educational expenses in the counties of Estonia in 2008 compared to old funding model (%). Source: Data from Estonian Ministry of Finance 2008, compiled by authors.

The proportions of the funds for current educational expenses offered to counties by the state change considerably. Such a change in funding of general education might be regionally justified on the basis of objective indicators, if it can be followed that the schools of e.g. Hiiu, Põlva, Tartu and Võru counties have been in a better situation than those of Lääne and Ida-Viru counties. Unfortunately, no such research has been done.

At average growth in funding sum nearby 13.7%, revenues in more than ten schools will increase by more than 40%, while in more than 40 schools the funds allocated for 2008 will decrease nominally. Mostly the substantial decrease of financing has touched small schools in rural area. Even if there are sufficient arguments for introducing the changes, and the transition will be organized smoothly during three years, the negative impacts on the regional development could be not prevented.

The new calculation of funding takes into account the number of pupils and classes, but no other conditions causing discrepancies between the educational expenses of individual schools (such as different levels of exploitation costs). Unpredictable is the further development of the state current school funding. Either macro-economic or school-level criteria have been established in relation to the levels of funding. The existing organization will be unstable and may undergo further adaptations. The characteristics of the reform are depicted in table 1.

Table 1. The advantages and disadvantages of the new general education funding system

Improvements	Weaknesses
<ul style="list-style-type: none"> • Cost-saving via the large-scale activity of RKAS • Financial empowerment of RKAS in the procurement of means • Avoiding state budget deficit • Increased authority of municipalities in deciding the location and volume of investments • Funding of educational expenses no longer local-government-, but school related • Funding per capita replaced by funding based on the number of classes and pupils in classes • Rapid increase in allocations for educational expenses in several schools 	<ul style="list-style-type: none"> • Peculiarities of institutions and special needs of small schools in rural area are not given enough consideration • Service fees of RKAS too high • The principles of calculating school investments as part of the loan burden of municipalities are unclear • Allocation of the investment component fails to take into account the real investment need and the volume of investments already made • The criteria for assessing the sustainability of schools are unclear • The per capita investment component is insufficient and its development trends not regulated. • Sufficient funds for investment will be available only if the growth of the investment component is tied to GDP growth • Ignores the differences in the financial capacity of municipalities • Ignores differences in exploitation costs

Source: compiled by the authors.

As already said above, because of the economic and fiscal crises the reform of general education funding has lost desired advantages and suspected weaknesses have been realized. The competences of municipalities and central government regarding school location and operation need more clarification. School financing should be integrated in regional development plan. Criteria, to determine the school locations and the need of existence of schools, and acceptable schooling conditions, have to be developed jointly between central government and municipalities. Specifications have to be made for the establishment of private schools. The funding scheme should comprise a rule to determine the total funds available to subsidize investment and current activities by the central government, e.g. percentage of all expenses for internal affairs, a percentage of tax receipts of the central state, a relation to growth of GDP. Moreover, there should be a stipulation determining the institution that has to finance investment. This can be the municipality through a loan from the central state, by debts in a framework of public private partnership, loans from the capital market, the use of municipal or central state owned real estates or municipal finance from other sources.

The central government may finance investment by loans, tax receipts, profits or revenues from real estate management or public enterprises etc. In order to protect fiscal autonomy of municipalities they may come to a sharing of investment costs according to fixed percentages. In this framework present financial allocation rules to schools may be applied. Particular situations of municipalities in distressed areas, e.g. in border areas, may be considered in a special addition to general grants.

The current reform may end up in a sophisticated planning system where the municipalities have to give up a considerable part of their organizational and fiscal autonomy. Therefore, we discuss whether through so-called Functional Overlapping Competing Jurisdictions (FOCJ) some of the ramifications of the reform could be avoided.

2. FOCJ to improve the financing system of general education

2.1. FOCJ: definition and integration into the financing system

The Reform might be totally or partially changed by introducing FOCJ. FOCJ are functional, overlapping, competing, jurisdictions, which are recommended to organize the production of special public services such as school services. The concept is not very new but Frey (Frey 1997; Frey and Eichenberger 1995, 1996, 2006; Eichenberger 1998, 2002; Spindler 1998; Detig, Feng, Friedrich 2002; Friedrich 2002, 2006; Dohse 2007; Bartholomae, Friedrich 2008) has initiated a discussion for application of this concept in the European Union.

FOCJ might be categorized according to their members to:

- (1) FOCJ with citizens as members, e.g. school communities in Switzerland
- (2) FOCJ with jurisdictions as members, e.g. Association of municipalities for school services
- (3) FOCJ with jurisdictions, institutions of public and private law as members, e.g. communities, public schools, private schools
- (4) FOCJ with citizens, and entities of private and public law as members, e.g. jurisdictions, associations, chambers of handicraft and commerce, firms, citizens interested in school activities).

All of them might be applicable in Estonia, but we concentrate on type (2) that is more close to the reform system described above. School-FOCJ compete for municipalities as members to organize the provision of school services. A municipality can choose to establish jointly with other municipalities a FOCJ or it may participate in an already existing FOCJ. A FOCJ is functional because it concentrates on a specified type of school services, e.g. elementary schooling, secondary schools, high schools. The FOCJ are overlapping because several of them may offer the same education services in a region. It does school investments and operates the schools.

The legal form may be that of a public association for special purposes. This form is often used in some countries (Detig, Feng, Friedrich 2002). A legal form of this type

for cross border cooperation in the European Union has just been created (Regulation (EC) No 1082/2006).

If such a possibility exists: Which municipalities are going to form or participate in such a School-FOCJ? We tackle this question within a model (1). Apart from financing the establishment of the FOCJ, investments and operational activities of the schools possessed by the FOCJ must partly be financed by the members through capital participation (simple arrow, figure 2). To some extent they may use the reform grants mentioned. We discuss a model (2) (showing how the contributions of the municipal members are fixed if contributions are related to the number of pupils (dotted arrow, figure 2). The FOCJ will be the partner of central government representing their municipal members as a joint association. Therefore, they receive the Estonian special grants to renovate, extend, construct, etc. schools (symbolized by a thick arrow, figure 2). Thus we refer to a model (3) to specify the negotiation solution on such grants. The FOCJ may be integrated into the reform system as shown in figure 2.

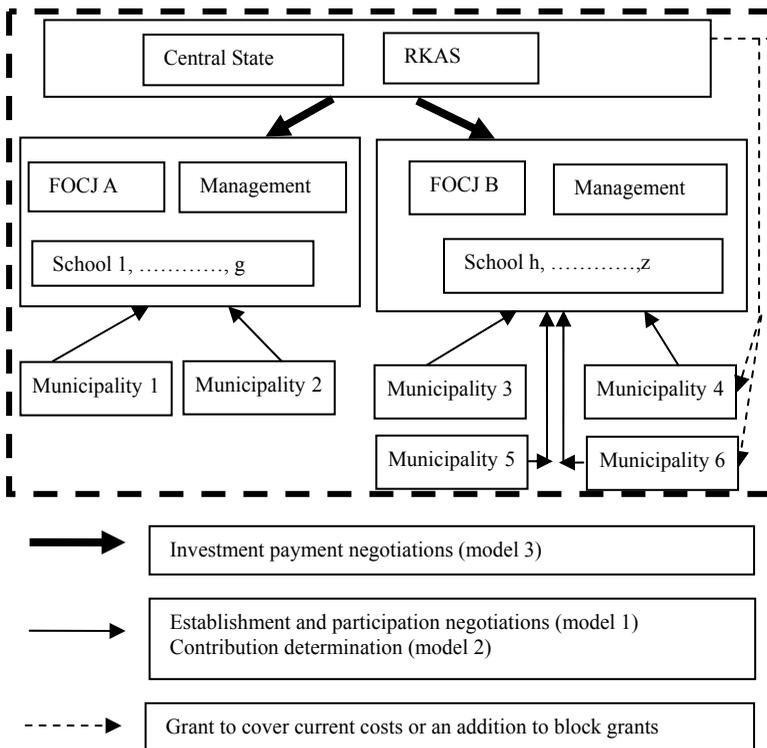


Figure 2. The role of FOCJ concerning the funding reform.

2.2. Establishment model for school-FOCJ

The municipalities have to decide which resources should be dedicated to the FOCJ. Such resources might be expressed in monetary terms (financial means, real estates, existing schools, etc.) and named as x . x_i shows the resources brought in by town i and $\sum x_j$ ($j=1, \dots, n$) shows the total amount of resources X dedicated by municipalities to the FOCJ. X_R depicts the total resources of the FOCJ without that of the town i . The possible number of towns is indicated by n . The town i expects advantages from schooling the pupils by the FOCJ and expects higher advantages from its engagement in the FOCJ if the share of its resources in the FOCJ increases⁵. These advantages are expressed by the parameter c_i . The dedication of resources by the town to the FOCJ shows also some negative effects⁶ captured by the parameter b_i ⁷. We obtain a utility function of town i (c.f. figure 3):

$$(1) \quad u_i = c_i \cdot (x_i / \sum x_j) - b_i \cdot x_i ;$$

$$(2) \quad X_R = X - x_i ;$$

$$(3) \quad u_i = c_i \cdot (x_i / (x_i + X_R)) - b_i \cdot x_i = c_i \cdot (1 - X_R / (x_i + X_R)) - b_i \cdot x_i .$$

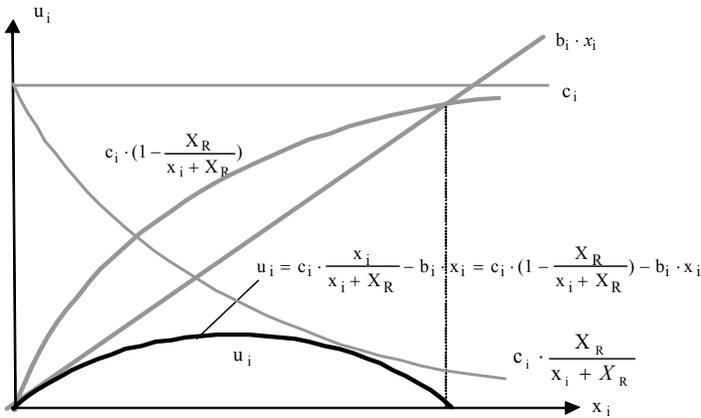


Figure 3. Utility development of town i .

In case of n candidates the uncertainty about the strategies chosen by other communities' increases. Therefore, we assume that the municipalities escape to a more simple autonomous strategy that means that one municipality maximizes utility under the assumption that the others do not react that means X_R the offers of

⁵ There might be more pupils taught or the location of schools can be situated more in favour of citizens of the town, transportation times and costs may diminish. There might be broader educational program if pupils from different towns are educated jointly.

⁶ Such as opportunity costs, less centrality of the town if the schools are not located there, transportation times for pupils and other unfavourable effects on achievement of municipal goals.

⁷ Other forms of b_i can be treated as well (Friedrich 2002: 248-250).

the other partners keep constant. The solution found refers to an approach of Cornes and Hartley (2001). The utility function (1), (3) becomes maximized⁸:

The optimum share of resources in FOCJ turns out (c.f. figure 4) to:

$$(8) \quad x_i/X = 1 - (b_i/c_i) \cdot X.$$

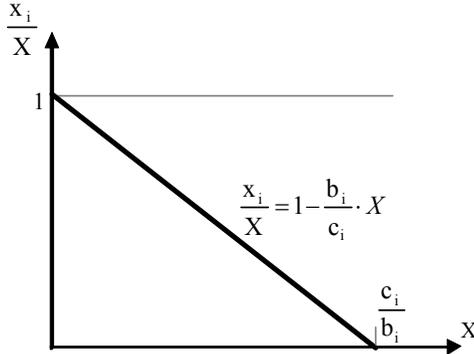


Figure 4. Best response of town i.

The optimal solution that means the optimal number of communities and the adequate volume of X is determined where the sums of the values of the optimal shares add up to one (c.f. figure 5). To participate in a FOCJ the cost/benefit ratio must be smaller than the average of the sum of other members of the FOCJ.

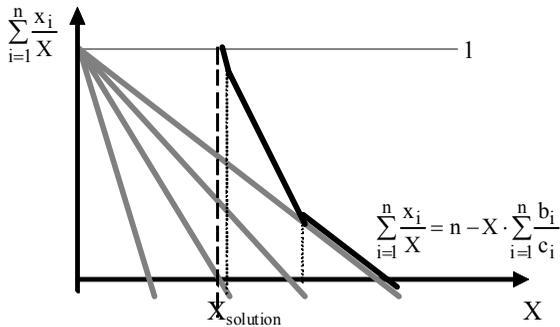


Figure 5. Solution of FOCJ formation.

⁸ (4) $du_i/dx_i = c_i(X_R/(x_i + X_R)^2) - b_i = 0$;

(5) $x_i = \sqrt{(c_i/b_i) \cdot X_R} - X_R$;

(6) $x_i = \sqrt{(c_i/b_i) \cdot (X - x_i)} - (X - x_i)$;

(7) $X = (c_i/b_i) \cdot (1 - (x_i/X))$

Many times favourable benefit/cost relations develop for neighbouring municipalities that are going to form a FOCJ and thus delegate part of their school competences to the FOCJ. Competition among existing FOCJ can be considered in extended models. Municipalities, which do not like to join an FOCJ, have low c parameters. They have a high preference for small schools and high opportunity costs.

2.3. A model of contribution to the operating costs by the FOCJ members

The members of the FOCJ have to cover a share of the operating costs of the FOCJ⁹. For sake of simplicity we assume that a specified percentage of costs are to be covered by the members. The members have to pay a contribution that is equal, (e.g. per pupil, or related to resources dedicated to the FOCJ) to the costs per unit. The usage of the services of the FOCJ depends also on the contribution to be paid. If the costs are high less usage is made of the capacities of the FOCJ services. There might be still some uncomfortable substitution possibilities for the municipalities.¹⁰ An added up demand curve of all members exist for the services of the FOCJ depending on the level of cost contribution per service unit the municipalities have to pay. The FOCJ possesses a management that shows a utility function related to the production and labour input of the FOCJ.

If the rule of cost coverage is stipulated and the management has the right to fix or to suggest the contribution rate on basis of costs the following results are obtained. The model comprises a modification of a fee determination model (Friedrich 1998; Friedrich, Kaltschütz, Nam 2004).

It comprises:

- A utility function U of the public firm's management depending on output Z and labor input L .

$$(1) U = U(Z, L), \quad \partial U / \partial Z = U'_Z, \quad \partial U / \partial L = U'_L$$

- A restriction concerning the production function. There is one fixed factor A and there are two variable production factors, $L =$ labour and $C =$ materials.

$$X = f(L, C) \quad \begin{array}{l} \partial f / \partial L = f'_L > 0 \quad \partial f / \partial C = f'_C > 0 \\ \partial f'_L / \partial L = f''_{LL} \leq 0 \quad \partial f'_L / \partial C = f''_{LC} \leq 0 \end{array}$$

$$(2) \partial f'_C / \partial L = f''_{CL} = f''_{LC} = \partial f'_L / \partial C > 0$$

- A demand function showing the relationship between price P and volume Z of output sold

$$(3) P = P(Z), \quad \partial P / \partial Z = P' < 0$$

⁹ Some costs, e.g. interest payments, normal amount of teacher services, etc., might be paid by the central state.

¹⁰ If the costs are high less usage is made of the capacities of the FOCJ services. There might be still some uncomfortable substitution possibilities for the municipalities.

- The cost function demonstrating fixed cost K_A and two types of variable cost. The factor price of labour is w and that of materials is i , hence
- (4) $K = K_A + wL + iC$
- Under Estonian conditions the towns have to cover a percentage g of the variable costs K_V , they need not to pay for K_A
- (5) $g \cdot K_V = g \cdot (wL + iC)$
- A restriction that contribution revenue is equal to total cost is introduced. We assume a self-financing FOCJ
- (6) $P(Z)Z = g \cdot (wL + iC)$
- Utility maximization of management under the restrictions mentioned above leads to the following Lagrange equation
- (7) $\Lambda = U(Z;L) + \lambda(P(Z)Z - g \cdot (wL + iC))$, where $Z = f(L,C)$
- The following first-order conditions for the utility maximization are delivered
- (8) $\delta\Lambda/\delta\lambda = P(Z)Z - g \cdot (wL + iC) = 0$
- $$\delta\Lambda/\delta Z = U'_Z + \lambda(\delta P/\delta Z \cdot Z + p) = 0$$
- $$\delta\Lambda/\delta L = U'_Z \cdot f'_L + U'_L + \lambda(P' \cdot f'_L \cdot Z + P \cdot f'_L - g \cdot w) = 0$$
- $$\delta\Lambda/\delta C = U'_Z \cdot f'_C + \lambda(P' \cdot f'_C \cdot Z + P \cdot f'_C - g \cdot i) = 0$$

Equations (8), (9) show two optimality conditions. One concerns the equivalence of the relation of marginal utilities of marginal factor-inputs to the proportion of respective marginal profits from contribution and the other refers to the contribution rate under the percentage of cost coverage. Consequently

$$(U'_Z \cdot f'_L + U'_L)/U'_Z \cdot f'_C = (P' \cdot f'_L \cdot Z + P \cdot f'_L - g \cdot w)/(P' \cdot f'_C \cdot Z + P \cdot f'_C - g \cdot i)$$

(8)

and $P = (g \cdot (wL + iC)/Z)$ (9)

The optimal contribution rate from the point of view of FOCJ-Management is shown by figure 6 at point B. Here the management of the FOCJ has a high influence on the contribution and the towns are depending to high degree on the type of management that manages the FOCJ (c.f. figure 6). If it is only interested in Z that means $U(Z)$ than it realizes cost minimization with a low contribution rate and no X-inefficiency according to Leibenstein. Several types of managers can be considered that evaluate pupils education and labour input positively (type I), are only interested in education (type II), or that want to maximise labour (type III) (c.f. figure 6). Type I and III are Leibenstein X-inefficient, but produce more than under profit maximization (hidden).

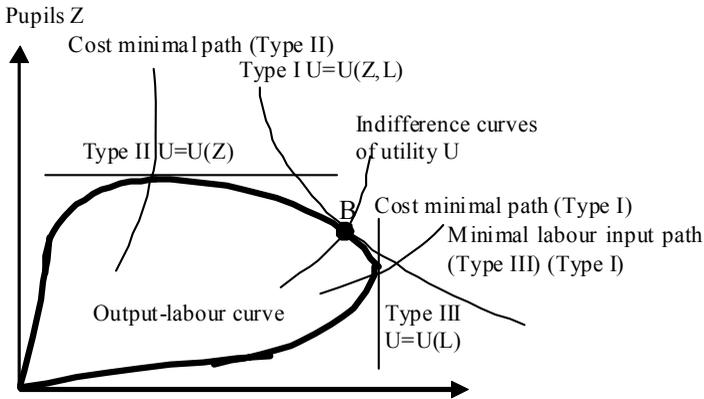


Figure 6. Types of managers of FOCJ.

This approach opens an analytic framework for the analysis of school FOCJ-behaviour. Typical conditions can be considered as well. Restrictions result for the FOCJ management to produce to costly. Some municipalities do not use the FOCJ if the contribution rate becomes too high.

Moreover, there might be a monitoring council of the municipalities and a negotiation process between the FOCJ management and the municipalities' representatives in the council. This can be considered in an extension of the model with utility functions of the management and a utility function of the council, e.g. the council $U_T(Z)$ and the management $U_M(Z, L)$. A utility combination results along the pupil-labour curve between the tangency point of type II (highest utility of the council) and tangency point of type I (highest utility of management). It shows a utility frontier concerning the two negotiators where a Nash solution can be identified. It shows a higher education volume than according to the wishes of the management. (c.f. Friedrich, Dehne, Nam 2009)

Moreover, if towns can leave the FOCJ maximum restrictions can be introduced that show a contribution rate and related a utility level at which the towns leave the FOCJ. There is a pressure in the direction of lowering costs involved.

Horizontal competition among school-FOCJ can be introduced if towns are allowed to send pupils to FOCJ where they are no members or if they are allowed to be member in several of them (similar Friedrich 2002).

2.4. Model concerning special grants

Under Estonian institutional conditions the fixed costs are mostly covered by the central government. This concerns especially the construction and extension costs of schools. Therefore a FOCJ should apply for a credit from RKAS or for a conditional grant. We turn at first the case of conditional grant, Negotiations between the FOCJ and a ministry or RKAS take place to specify the conditions for such a special grant. A similar problem was tackled by Friedrich, Gwiazda, Nam (2007).

The ministry (RKDA) evaluates a unit of investment for a pupil by g_{ZL} and a unit of grant by g_{FL} . The resulting utility the ministry wants to maximise is:

$$(1) U_L = g_{ZL} \cdot Z - g_{FL} \cdot F \rightarrow \max$$

The utility of the FOCJ is determined by evaluation of the educational services through the parameters a , b and by the evaluation of a unit of grant g_{FG} . The utility function

$$(2) U_G = (a - b \cdot Z) \cdot Z + g_{FG} \cdot F \rightarrow \max$$

is to be maximized by the FOCJ.

An indifference curve of the ministry shows the condition (c.f. figure 8):

$$(3) dU_L = (\partial U_L / \partial Z) \cdot dZ + (\partial U_L / \partial F) \cdot dF = 0$$

for that of the FOCJ we obtain:

$$(4) dU_G = (\partial U_G / \partial Z) \cdot dZ + (\partial U_G / \partial F) \cdot dF = (a - b \cdot Z) dZ + g_{FG} \cdot dF = 0$$

The two equations deliver the solution:

$$(5) dF/dZ = g_{ZL}/g_{FL} = -(a - 2bZ)/g_{FG}$$

$$(6) Z_{Pareto} = (g_{ZL} \cdot (g_{FG}/g_{FL}) + a)/2b$$

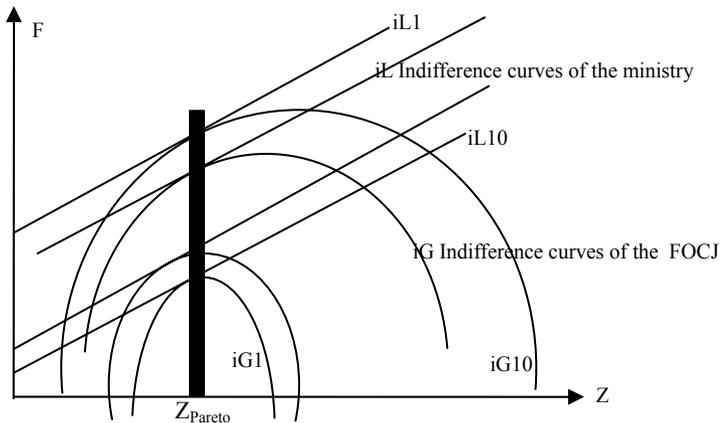


Figure 8. Negotiation situation between ministry and FOCJ. Indifference Curves and possible solutions.

The utilities along the Pareto-solution are:

$$(7) U_L = g_{ZL} \cdot Z_{\text{Pareto}} - g_{FL} \cdot F$$

$$(8) U_G = (a - b \cdot Z_{\text{Pareto}}) \cdot Z_{\text{Pareto}} + g_{FG} \cdot F$$

$$(9) \text{ While } Z_{\text{Pareto}} = (g_{ZL} \cdot (g_{FG}/g_{FL}) + a)/2b \text{ turns out constant (c.f. figure 8).}$$

If we solve one equation for F and if we substitute F in the other one we receive:

$$(10) \begin{aligned} U_L &= -g_{FL}/g_{FG} \cdot U_G + (g_{ZL} + g_{FL}/g_{FG} \cdot (a - b \cdot Z_{\text{Pareto}})) \cdot Z_{\text{Pareto}} \\ &= -g_{FL}/g_{FG} \cdot U_G + g_{FL}/g_{FG} \cdot (g_{ZL} \cdot (g_{FG}/g_{FL}) + a)^2/4b \end{aligned}$$

It demonstrates the utility frontier between the two negotiators (c.f. figure 8, 9). To derive the negotiation solution we maximize the Nash product (NP) considering minimum utilities that the ministry $U_{L\text{Min}}$ and the FOCJ $U_{G\text{Min}}$ want to achieve and the utility frontier (c.f. figure 9). The expression:

$$(11) \Lambda = (U_L - U_{L\text{Min}}) \cdot (U_G - U_{G\text{Min}}) + \lambda(-U_L - g_{FL}/g_{FG} \cdot U_G + g_{FL}/g_{FG} \cdot (g_{ZL} \cdot (g_{FG}/g_{FL}) + a)^2/4b)$$

$$(12) \delta\Lambda/\delta\lambda = -U_L - g_{FL}/g_{FG} \cdot U_G + g_{FL}/g_{FG} \cdot (g_{ZL} \cdot (g_{FG}/g_{FL}) + a)^2/4b$$

$$(13) \delta\Lambda/\delta U_L = U_G - U_{G\text{Min}} - \lambda = 0 \quad \lambda = U_G - U_{G\text{Min}}$$

$$(14) \delta\Lambda/\delta U_G = U_L - U_{L\text{Min}} - \lambda g_{FL}/g_{FG} = 0 \quad \lambda = g_{FG}/g_{FL} \cdot (U_L - U_{L\text{Min}})$$

We obtain:

$$(15) U_{L\text{Nash}} = ((U_{L\text{Min}} - (g_{FL}/g_{FG}) \cdot U_{G\text{Min}} + g_{FL}/g_{FG} \cdot (g_{ZL} \cdot (g_{FG}/g_{FL}) + a)^2/4b)2$$

$$(16) U_{G\text{Nash}} = ((U_{G\text{Min}} - (g_{FG}/g_{FL}) \cdot U_{L\text{Min}} + g_{FG}/g_{FL} \cdot (g_{ZL} \cdot (g_{FG}/g_{FL}) + a)^2/4b)2$$

$$(17) F_{\text{Nash}} = (U_{G\text{Min}}/2g_{FG} - U_{L\text{Min}}/2g_{FL} + (g_{ZL} \cdot (g_{FG}/g_{FL}) + a) \cdot (3g_{ZL} \cdot (g_{FG}/g_{FL}) - a))/8bg_{FG}$$

If the parameter b increases the grant F decreases. If a is smaller than $g_{ZL} \cdot (g_{FG}/g_{FL})$ it increases as long as a is larger than $g_{ZL} \cdot (g_{FG}/g_{FL})$. If FOCJ expands its education services the ministry or RKAS is willing to pay a higher conditional grant as long as the difference $g_{ZL} \cdot Z - g_{FL} \cdot F$ increases. If the evaluation of the FOCJ is high the grant keeps smaller. The model can be extended to the case where several FOCJ compete for the grant. The FOCJ that offers the highest utility to the ministry will win.

The ministry and the FOCJ show utility functions depending on the Volume of the grant F and the amount of school service Z that lead to a mapping of the sets of utility curves shown in figure 9. Possible solutions reflect the points of tangency between the indifference curves at a volume Z. A Nash solution gives us in figure 9 the result of the negotiation between the ministry and the FOCJ. If FOCJ expands its education services the ministry or RKAS is willing to pay a higher conditional grant. The model can be extended to crediting as well. The RKAS has a similar utility function but it gives better conditions if the number of pupils the FOCJ is willing to teach increases. The FOCJ is considering the amortization as fixed costs and the model (2) can be integrated. Such an approach was used for a theory of real estate sale to firms by municipalities including and a federal real estate institution (Feng, Friedrich 1993).

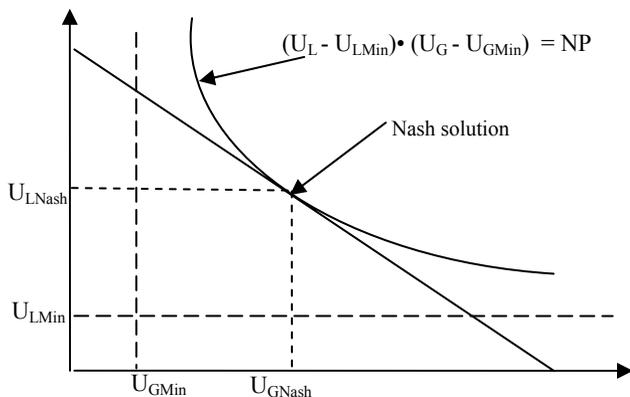


Figure 9. Nash solution of conditional grant.

2.5. FOCJ to improve the financing model of general education

The introduction of FOCJ improves the financing model of the general education in Estonia (see table 2). In this system the FOCJ or individual municipalities own schools. FOCJ possess budgets. Their revenues are from contributions of municipalities, debts, grants from central government, sale of unused school buildings. Their expenses are for school investment, school operation, and amortization. The new funding system can be considered within this FOCJ oriented framework. The FOCJ negotiates for his members the investment funds, school locations and teaching programs influenced also by the member municipalities. The operational central government funding can be received by municipalities operating own schools or through the number of classes they fill up with their pupils within the FOCJ. For shake of simplicity this amount can be directly transferred to the FOCJ thus lowering the contributions of the respective municipalities. Detailed research concerning the legal possibilities to introduce school FOCJ in Estonia is welcomed.

3. Institutional basics for educational FOCJ in Estonia

The FOCJ model of financing the general education can be introduced because an appropriate juridical company form is available in Estonia and there is the desire to contract out the local public services in Estonia.

Local Government Organisation act (RT I 17.12.2010, 33) § 35 gives the municipalities rights to establish foundations and to participate in foundations for achieving goals described in the statutes of the foundation. The establishing, work and liquidation of foundations is regulated by Foundation Act (RT I 17.12.2010, 28). Differently from business organisations foundations are non-profit organisations for offering services for community and they are juridical personalities of public law.

For cross border co-operation in FOCJ the European form of a European Grouping of Territorial Cooperation (EGTC) (Council of Europe 2006; European Union 2008), which is of public law or the European Economic Interest Grouping (Council of Europe 1985) of private law.

Table 2. Improvements of financing model of general education expected from FOCJ

- The system of planning gets stabilized as rules prevail that cannot be changed according to sudden changes of the power structure in Parliament and Central Government. Ministries, RKAS, FOCJ and municipalities have to keep to stable acceptable rules and solutions to keep the sector stable, e.g. longer term principles of subsidization.
- Participants are forced to agree on indicators used to subsidize, to plan schools etc. that are permanently in use and at least to a FOCJ and its members.
- The autonomy of municipalities is not totally lost. They can organize political influence through the FOCJ organization, they co-ordinate and they have an agent that is acting in favour of them.
- The FOCJ takes care of more pupils thus representing more families, voters, party members.
- The FOCJ achieves better fiscal solutions with the central government as they can organize more classes.
- FOCJ representing several schools might be a better negotiation partner for banks. More times achievement of private profits, e.g. banks, real estate companies, consultants' expert ices can be avoided. The power of the central government and RKAS is reduced, for they rely also on information and co-operation with FOCJ.
- The FOCJ is able to have a higher skilled management that is able to negotiate with RKAS or even consider European procurement laws and to organize a house keeping and facility management system.
- It can offer more carrier chances to teachers and might broaden the teaching programs.
- Because of higher economic potential FOCJ can maintain small schools more easily, on the other hand it can reduce the disadvantages of school closures.
- There is no centralized school planning by the central government necessary. There will be regional planning concepts by the FOCJ in such a way that the municipal autonomy is not totally lost. The municipalities as FOCJ members are incorporated through the decision making bodies of the FOCJ. School clusters are going to be established.
- The FOCJ also depend on the municipalities because municipalities can opt out or change to another FOCJ, e.g. if the contribution becomes high. The FOCJ compete with school services and low costs for the municipalities.
- The management that has to consider more low-cost productions (e.g. is of type 1).
- The school sector is not so influenced by day to day politics and political business.
- The municipalities get less exploited by private business through unfavourable Public Private Partnership, leasing and similar solutions.

Source: compiled by authors.

The foundations offer a democratic structure for co-operation of the municipalities with each other, but also with public and private juridical persons. Municipalities can be participants and through participation fees they can ensure the financing of foundations. It is also possible to transfer public authority to such institutions to execute public tasks, e.g. school planning, and partly education competences. Moreover, municipalities are allowed to transfer means for current expenses through their budget to the FOCJ and they may give grants for FOCJ if investments are not fully covered by the investments funding through the central government budget or RKAS. Moreover, FOCJ may raise public debts in form of loans with banks.

There might be some problems concerning foundations for public educational services (FOCJ) established by municipalities:

- approval of FOCJ by monitoring central state authorities,
- open questions about the taxing of such public institutions,
- possibilities to model the voting and power of membership of municipalities in decision making bodies of FOCJ of such kind,
- possible extent to which public tasks can be switches to foundations,
- the power of the member communities to bind their representatives in the decision making bodies to their decision will,
- the inclusion of the FOCJ debts to the allowed debts of member communities,
- the possibilities and necessities to guarantee for debts of the FOCJ by member communities,
- the legal situation of the leading managers in directory and the supervisory board,
- the transfer of municipal or central state real estates to the FOCJ,
- participation rights of staff in decision making have to be considered.

Most of this problems may be solved in the framework of the statutes of the foundation (§ 8 of the Foundation Act) and in discussions with central government institutions which have to approve the legal form of the FOCJ to be established.

More restricted possibilities are prevailing if the municipalities are going to choose a company form of private law (Bartholomae, Friedrich 2008). With the stock company the competences of the directory are too strong concerning current management, finance and investment decisions and the influence of municipal member share holders is weak because it concerns in the shareholders assembly only some fundamental rights referring to the structure of the firm. Supervisory boards could be installed which can only bind some decisions of directory internally but not against third parties. It is normally not possible to switch public tasks and authority, e.g. school planning, to a non-public body of private law. More adequate might be a limited partnership of public municipalities because the decision power of the proprietors is much stronger, but there is also the barrier of being not of public law and difficulties to execute public tasks by means of public authority exist. Also designated in its legal form for cooperation among the members and the possibilities to include municipal members, there are also difficulties to shift public municipal competences to the FOCJ in form of a cooperative. If a legal private form of

institution is chosen the FOCJ will not be able to execute the full function of the FOCJ. The FOCJ may be restricted to auxiliary tasks, to prepare common appropriate decisions of the municipalities to establish and operate a school network.

Another possibility might offer a contract of public law between the included municipalities to establish and operate a FOCJ showing the structure mentioned above. There we have the problem of incomplete contracts which hinder decision making in situations not in advance considered in the contract.

According to our opinion there are institutional possibilities to operate FOCJ if central government and municipalities are willing to come to solutions. FOCJ may also be serve to overcome the next 30 years until a finite solution of territorial municipal reform and functional reform of Estonian public sector is going to be found.

The report of the research centre PRAXIS (2009) is described the present situation for contracting out local public services in Estonian municipalities. The experiences of co-operation with non-profit organisations for offering public services have about 60% of municipalities, ca 42% of municipalities practice the contracting out of public services to non-profit organisations. Mostly contracting out take place in field of social (42% of all cases), sport (15%) and culture (10%) services. The municipalities have interest to contract out the public services if it helps to access new sources of financing and to increase the quality of public services. At the same time, the co-operation between municipalities is very rare, there is the tendency to local protectionism, especially in small municipalities (contracting out only to partners on own territory). (Praxis 2009: 7-8).

The introduction of FOCJ to organize educational services in Estonia causes radical changes in mutual co-operation. The central government should create favourable conditions to educational FOCJ to promote municipalities to use this kind of voluntary co-operation.

Summary

To reduce the weaknesses a more and more tight central planning system is debated that abolishes to a large extent municipal autonomy. A compromise would concern the establishment of so-called Functional Overlapping Competing Jurisdictions (FOCJ) for schools. The municipalities can be members there. The FOCJ is like a special purpose municipality. It takes care of the schools, negotiates with central government for financial support and has own revenues consisting of contributions of the member municipalities, grants from central government and sale of unused school real estates and own debts. The municipalities can participate in an FOCJ; they can leave a FOCJ, enter a competing FOCJ or operate schools themselves. A theory of FOCJ establishment, a theory of contribution formation for municipalities, and a theory of grant or loan negotiation is offered to estimate the behaviour of FOCJ. The concept can be realized in Estonia by means of establishing so-called foundations as legal entity of public law.

The realization of the FOCJ concept would stop the shift of power to the central government in favour of keeping more municipal autonomy and enables regional specific solutions in Estonia.

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