

Structural Policy as Investment Decisions in Finnish Rural Areas in 2000-2006: A Social Accounting Matrix Approach

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Abstract. This paper investigates the effects of the EU structural and agricultural policies on rural areas of different economic structures. The two Provinces that were chosen to represent these different structures are South Ostrobothnia with an agriculture-dependent economy and North Karelia with a more mixed structure of production. Social Accounting Matrices (SAMs) were constructed for both Provinces to analyse the effects of structural policies between 2000-2006, which will be both the third Community Support Framework and the Agenda 2000 period. Three different policy scenarios were formulated: Agenda 2000, trend and non-cohesion scenarios. Agenda 2000 would have negative effects on South Ostrobothnia, whereas North Karelia would benefit from the proposed increase in structural funds in the new Objective 1, thus having an overall positive effect. South Ostrobothnia would clearly benefit if the trend scenario would be realised so that the current support levels would be extended to the next programme period. Both of the study regions would suffer from a shift to an EU-wide non-cohesion structural policy.

Keywords: structural policies, CAP, EU, Social Accounting Matrix, scenarios

1. Introduction

1.1 Background

Rural development, in association to a balanced regional development, has long been an important goal in the Finnish society. This is quite natural, because Finland is the most rural country in the EU, as 57 per cent of the population live in areas classified as rural, and these areas account for 98,5 per cent of Finnish territory (OECD, 1995). As Finland is the fifth largest country in the EU, this is a vast rural area also in the

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context of the entire European Union. Rural development, the diversification of rural economies, and the promotion of new economic activities and new sources of income in rural areas are gaining increasing importance also in the European Union (e.g. Commission 1995, 1997a, 1997b). Significant economic and social changes undergoing in the rural areas of the EU are further affected and sometimes accelerated by the agricultural policy reforms (the 1992 CAP Reform and the 1997 Agenda 2000 proposals). The increasing role of (integrated) rural development policies (the 1988 reform of the EU Structural Funds and the Agenda 2000 proposals) must also be considered.

The research project was divided into four Tasks. This paper will focus on Task 4, for which the objectives were defined as:

- to develop alternative scenarios with regard to the Structural Funds and the CAP of the EU,
- to assess potential implications of the scenarios on the rural economies under study, considering both market and non-market effects, and
- to recommend structural policies, which could beneficially and efficiently steer the socio-economic development of poor, remote rural regions.

The selected three scenarios of Task 4 are:

1. Trend Scenario
2. Agenda 2000 Scenario
3. Non-Cohesion Scenario.

The scenarios (chapter 3) are based on the use of Social Accounting Matrices (chapter 2) as tools of analysis. The results obtained (chapter 5) from the specified scenarios (chapter 4) are for the year 2006, the end of the third programme period.

1.2. Description of the study areas

The overall purpose of the STREFF project was to study the adjustment process of the remote and poor rural areas in Greece, Finland and Scotland. Remote, peripheral rural areas are often characterised by low population density and a high dependence on agriculture. Instead, rural areas closer to the centres have usually higher population density, a lower dependence on farming, a more developed and diversified economic base, and, naturally, greater proximity and access to main markets. In the EU Structural Funds, most of the peripheral rural areas have been designated as Objective 1 or 5b areas in general, and Objective 6 for regions of very sparse population density in Finland and Sweden.

In Finland, North Karelia in eastern Finland represents the mixed, diversified economy, mainly concentrating on secondary and tertiary sectors and South Ostrobothnia in western Finland a non-mixed, largely agricultural and agriculture-dependent economy. In the EU Structural Funds, North Karelia is classified under Objective 6 and South Ostrobothnia under 5b area. These provinces belong to the NUTS-3 category, which consists of a total of 19 regions in Finland. These are rather large areas, which may contain variation in some characteristics even within the

region. However, certain clear, typical key characteristics can be identified for both regions.

North Karelia has sparse population, depopulation problems especially in its most rural areas, and it is relatively remote from the Finnish perspective. It is also a poor region in Finland, as is South Ostrobothnia. The GDP per capita index was 74 and 72, respectively, as it was 92 in Finland and 100 in the EU in 1994, and the corresponding figures were 74 for North Karelia and 73 for South Ostrobothnia in 1996, in Finland as a whole the figure was 97. North Karelia has potential to further strengthen prevailing diversity in its economy by utilising its abundant natural resources, especially forests and waterways and lakes, and good infrastructure in terms of tourism. This, and other diversified economic activities, could benefit from border co-operation with Russia. South Ostrobothnia is clearly the most agriculture-dependent province in Finland. On the other hand, there is also quite strong tradition of small and medium size enterprise (SME) activities in South Ostrobothnia, which can offer alternative sources of income also in the future. These alternatives will most likely be needed, as agriculture will face further adjustment problems due to the Agenda 2000 proposals.

2. The Social Accounting Matrix

2.1. Definition and structure of a SAM

By definition, the Social Accounting Matrix is a general equilibrium data system, linking, among other accounts, production activities, factors of production and institutions (business units, households, government) in an economy. The SAM system can capture the circular interdependence characteristic of an economic system among production, factorial income distribution (i.e. the distribution of value added generated by each production activity to the various factors) and income distribution among institutions and particularly among different socio-economic household groups. The rows of a SAM present incomes or receipts, whereas expenditures or outlays are shown in the columns (Reinert and Roland-Holst, 1997). There are five types of accounts in the SAM: the production activities and factor (labour and capital) accounts, the current accounts of the domestic institutions (households, firms and government), the capital account and the rest of the world account.

More specifically, a SAM can be applied to the exploration by multiplier analysis, of the effects of exogenous injections on the whole economic system. These multiplier analysis have been typically applied to assess the economy-wide effects of an increase (or decrease) in demand for one sector or in the case of an external transfer to an institution. This type of analysis requires, however, the partition of the SAM into endogenous and exogenous accounts. Typically, the former includes production activities, factors of production and institutions (firms and households), while exogenous accounts consist of government, capital and the rest of the world (trade and transfers).

There are two main reasons behind the choice of the SAM modelling framework as our tool of analysis in this study:

- first, the ability of the SAM technique to capture the distributional effects of exogenous injections in an economy can be particularly applicable in the context of rural policy analysis in developed economies, where the evolution of part-time farming and the increasing level of off-farm incomes and rural development policy transfers, substantiate the proposition that analysis which focuses solely on production linkages (the traditional Leontief I-O approach) may ignore the implications (particularly the distributional effects) arising from other types of links between rural sectors (especially agriculture) and the macro economy;
- furthermore, the multisectoral dimension of SAM, accommodates the analysis of the effects induced by current rural development policies, which have shifted attention from the traditional product oriented support to more broadly based (multisectoral) approach.

The SAM is characterised by the disaggregated treatment of the non-production accounts, as inter-industry transactions are confined to a single submatrix. Furthermore, another important difference between a SAM and an input-output table is the inclusion of both row and column entries for the various types of production. In this way, the SAM table indicates value-added payments from the production sectors to the owners or providers of the factor services (institutions). Unlike national accounts or input-output tables, this feature highlights the issue of income distribution.

In a SAM, the production activities accounts buy raw materials and intermediate goods and hire factor services to produce commodities. Their expenditures (column 1) include the purchase of domestic and imported intermediate goods. The remainder concerns value-added, of which a part is paid to the government, while the rest is distributed to factors of production in the form of wages and rent to fixed factors. The receipts (row 1) derive from sales of intermediate goods to other industries, of final goods to households and the government, of exports and of investment goods to the capital account.

Factor accounts include labour and capital accounts. These receive payments in the form of wages, rent, subsidies and income from abroad as remittances and capital income. Their revenues are distributed to households as labour income and distributed profits, and to firms as non-distributed profits, after paying the corresponding taxes to the government.

Institutions include households, firms, and government, with households sometimes disaggregated in different socio-economic groups. Households' income include the factor incomes described above and various transfers coming from other households, the government, firms, or from abroad. Households' expenditure consists of consumption, direct taxes, transfers, with their residual transferred to their capital account. Firms receive profits, spend on taxes and transfers, and transfer their residual to their capital account. The government account is distinct from administrative activities, which are included in the production sub-matrix. Government receives income from taxes and transfers from abroad, spends on consumption and transfers (including subsidies) and transfer its (usually negative) surplus to savings.

For each of the three institutions, a separate capital account can be identified, but this is usually a very difficult task, due to data shortcomings. The capital account usually collects savings together with net foreign capital transfers from the rest of the world. This provides the necessary finance for domestic fixed capital formation and changes in stocks.

Finally, the economy receives income from the rest of the world as payment for exports and pays for imports to the rest of the world. Similarly, some factor payments are received from abroad, offsetting those paid to the rest of the world, and current transfers to and from abroad are made by the current institutions account. The current accounts deficit is covered by net 'foreign' capital transfers.

In Finland, Statistics Finland is a national level authority, which has the advantage to be able to oblige enterprises to release information for statistical purposes. This is why Statistics Finland has the most reliable regional data for our purposes. The availability of data is relatively good already at this point but the fact is that in the future the availability of the specific data needed for the construction of regional SAMs will be even better. This project can thus be regarded as an experiment to carry a SAM study in Finland. There are several projects in the Statistics Finland that will improve the data availability of SAMs in the future e.g. the construction of inter-regional input-output tables. The study regions were investigated through the 16-sector division, aggregating the sector division from the 64-sector division of input-output tables.

The sectors were chosen because they are significant when considering the objectives of the study and because they are important employment providers in the area. Sectors that are important for rural livelihood or sectors, which are expected to grow in future because of changing circumstances, were especially emphasised. The aggregation of course means that some of the accuracy of the analysis must be sacrificed, but as some sectors have only little effects in the study regions the importance of carrying these sectors in the SAMs would have been only marginal. The employment by sectors in 1993 was also calculated by the same sectoral distribution that was chosen for regional SAMs. These employment statistics are reported in Figure 1.

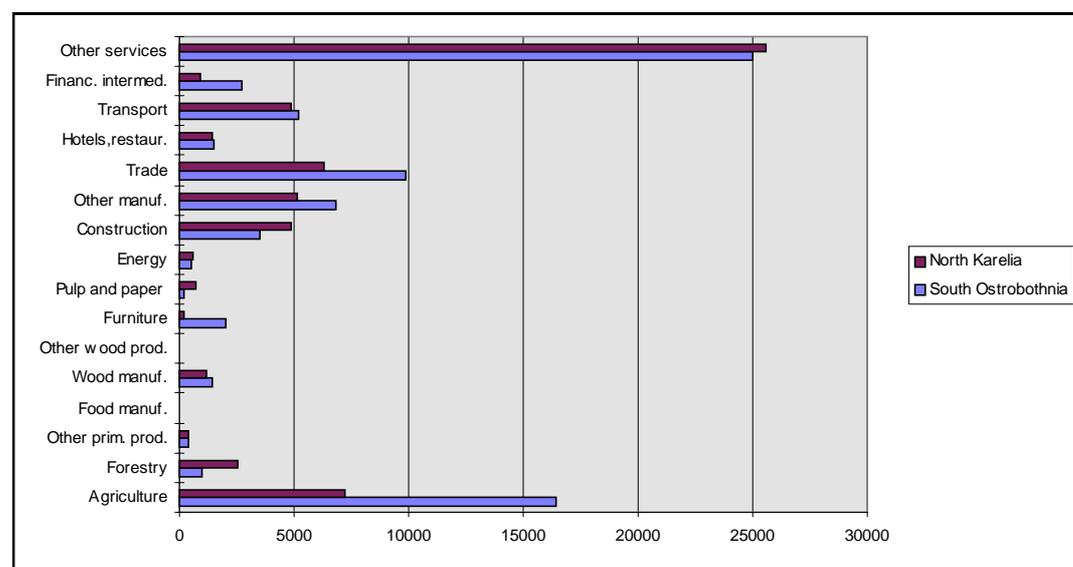


Figure 1. Employment in 1993 in the study regions according to the sectoral division (Tilastokeskus, 1998)

The data for the regional input-output tables of 1993 were based on the regional accounts of the national economy, national input-output tables of 1993 and information on regional service balances produced in the Statistics Finland.

2.2. SAM Multipliers

The extension of the Leontief model to a SAM framework is performed by partitioning the SAM accounts into endogenous and exogenous, and assuming that the column coefficients of the endogenous accounts are constant. Perhaps the most important issue is to determine which accounts are set exogenous and which endogenous, as the range of shocks that can be studied derives from the choice of the exogenous accounts.

Endogenous accounts are those for which changes in the level of expenditure directly follow any changes in income, while exogenous accounts are those for which we assume that expenditures are set independently of income changes. With an exogenous rest of the world account, simulations of changes in exports, household or government transfers can be performed. With an exogenous capital account, we can study shocks induced by changes in investment, while, with an exogenous government account, changes in transfers to value added or households can be simulated. Standard practice (adopted in this study) is to set the government, capital and the rest of the world as the exogenous accounts.

Having designated the endogenous and exogenous accounts of the SAM, we have:

	Endogenous Accounts (n)	Sum of exogenous accounts (1)	Total
Endogenous accounts (n)	MX	F	X
Exogenous accounts (m)	BX	L	
Total	X		

where X is the vector of total income or expenditure of the endogenous accounts, F the vector sum of the expenditures of exogenous accounts, L the column vector of the income of exogenous accounts, M the square matrix ($n \times n$) of coefficients of endogenous accounts, and B the rectangular matrix ($m \times n$) of the coefficients with exogenous accounts as rows and endogenous accounts as columns. Following that, we can define:

The matrix of accounting multipliers	$(I - M)^{-1}$
The vector of shocks	ΔF
The vector of impacts	$\Delta X = (I - M)^{-1} \Delta F$
The leakages	$\Delta L = B \Delta X$

Similarly, employment coefficients are defined as:

Direct Employment Coefficients $E1 = \hat{E} [X]^{-1}$

Global Employment Coefficients $\ddot{E} = \hat{E} 1(I - M)^{-1}$

where E is the row vector of sectoral employment.

The SAM accounting multipliers are (similarly to the input-output counterparts) demand-driven, while coefficients in the rows of the exogenous accounts provide the leakages (e.g. induced demand for imports, induced government revenues). In contrast to conventional input-output multipliers, which can only investigate the impact of changes in exogenous demand for output from the production sectors on the production sectors, the SAM can show the impact of exogenous injections to different categories of factor incomes on all endogenous variables. This is a distributional dimension, taking account different categories of labour and expenditure patterns. By bringing more elements into the matrix inversion process, the interdependency of the system can be increased. However, a negative aspect of this process is that the assumption of fixed expenditure coefficients applies to an increasing number of accounts.

2.3. Regional application

Since no particular SAM's classification and disaggregation could fit the wide range of possible policies, projects (the impacts of which are investigated in this study) and study area conditions, the classification scheme presented here indicates the structure of the SAM constructed for the study areas of South Ostrobothnia and North Karelia . It is partly determined by factors such as study area conditions, data availability and modelling purposes.

Regarding the structure of the SAM accounts and their components and taking account of the extensive data requirements in the case of the construction of regional SAMs, the following general points should be referred to:

- The economic agents whose incomes and expenditures are given in a regional SAM are strictly those who are residents in the case study region and their activities in this region (i.e. a GDP view of the regional economy);
- Regional SAMs constructed in this project will not separate production industries from commodities, due to data availability constraints. Instead, the interindustry matrix constructed will be symmetrical to the industry by industry matrices;
- The number of industrial sectors to be included in the interindustry matrix depends on issues such as the classification of available National input-output tables, the structure of the economy under investigation, and the type of policies and projects implemented in the study area; in the case of the study areas of South Ostrobothnia and North Karelia, the interindustry matrix will include 16 sectors;

- The South Ostrobothnian and North Karelian SAMs will include one category of labour (factor account) and only one household (institutions account), as structural policies in the area do not specify different target groups;
- The Government component of the Institutions account can be (at maximum) distinguished into three components (national government, regional government, EU). However, in the case of Finnish regional SAMs the separation of government seems an impossible task, taking account of the central role of the national government in terms of administration functions;
- The regional SAMs will include only one (Rest of the World) External account.

3. General scenarios

3.1. Trend Scenario

Trend scenario represents the continuation of the 1994-99 trend in Structural Policy Spending and 1996-97 trends in CAP spending in real annual-average terms, the base year being the base years of the regional SAMs of each partner's, in Finland 1993. In practice, especially in the light of the current Agenda 2000 proposals, this scenario is unrealistic with its status quo-nature. However, it provides a useful comparison point, and is in line with the conventional scenario exercises that commonly also include a trend scenario (Schwarz 1998).

Methodologically, concerning the regionalised SAMs, there will be no change in either the sectoral distribution of the expenditure or the technical coefficients of the regional SAMs. Hence, the achieved multipliers of the regional SAMs are applicable for the future, too. The scenario should have no limitations with respect to needed *data* as the data come from past years (and fixed development in Structural Funds for 1994-99), which is at the Member State level available from the common EU statistics. From Tasks 1 and 2 we have data available for e.g. support levels of different structural policies (projects, programmes) in our study areas.

In the next scenario, these expenditure levels of different objectives will be altered according to the Agenda 2000 proposals made and presented by the EC Commission in July 1997 and March 1998.

3.2. Agenda 2000 scenario

Agenda 2000 scenario means the implementation of Agenda 2000 Structural Policy and CAP proposals with minimal exploitation of flexibility and modulation. This is the so-called *normative scenario* as it is based on policy proposals and inherent (support) instruments that have been judged by the EC Commission to be the most efficient, especially in the use of Structural and EAGGF funds. This is true for the purposes that are generally, in the view of the Commission, regarded as necessary, acceptable and beneficial in the entire EU.

As we have agreed on to limit the exploitation of flexibility and modulation to its minimum in this Agenda 2000 scenario, the scenario cannot draw its normatism from the Member States' own decisions in terms of the exploitation of national flexibility permitted in the Agenda 2000 proposals. This restriction is useful as it makes the scenario more easily applicable in the regional SAM models and reduces data requirements and need for (uncertain) future assumptions of specific national/regional measures and their expenditure levels. Concerning the changes in the CAP measures and the new three Objectives of the SP, these measures and effects of their use have to be identified, decided and assessed for each study area.

In this Agenda 2000 scenario it is important that insertion of scenario elements and consequent calculations are made *year by year*, especially as the changes will occur in several phases and at different phase (e.g. CAP price cuts and SF Objectives phase-out periods: see below).

Structural Funds

For the purposes of our project, and Task 4 in particular, it is problematic that the Commission's proposals do not cover the definition of which regions qualify for each new Objective, nor the funds available to each member state or objective. Only the total budget for the EUs structural policies for the period 2000-2006 has been given: ECU 230 000 million at 1997 prices, of which ECU 210 000 million for Structural Funds and ECU 20 000 million for Cohesion Fund. The in detail proposals are expected only in the late 1998. However, some, mainly unofficial, statements and estimates have also been presented on the future developments, to some of which a reference is made in the following, sources being mainly recent publications of Agra Europe and those of national origin.

The existing 7 Structural Funds objectives will be reduced to 3 objectives. In addition, the Community Initiatives will be reduced from current 13 to 3. The Commission has stated that **Objective 1**, for regions "most in need", will cover 20 per cent of the EU population. It is expected to take about 2/3 of the Structural Funds, as currently. Thanks to economic improvement, it is estimated that many Objective 1 areas are likely to lose their status in the UK, Ireland, and Spain. If so, their funds will be phased out over a 6-year period (or 7 years for regions qualifying for the new Objective 2). On the other hand, it has also been stated that, based on the 1993-95 economic indicators, South Yorkshire (England) is likely to be the only region not currently included in the Objective 1. This will be in addition to those Objective 6 areas in **Finland** and Sweden, which will qualify for the new Objective 1. Rural measures of Objective 1 will be funded like earlier under EAGGF-*Guidance*.

According to the Agenda 2000 proposals, **Objective 2**, for regions "experiencing structural difficulties", will cover 18 per cent of the EU population. It includes 5 per cent of population living in *rural regions* confronted with serious problems such as depopulation (note that the current Objective 5b for *rural regions* covers 8,8 per cent of EU population, and as much as 21,5 per cent in **Finland**). The current Objective 2 and 5b regions that lose eligibility under the new Objective 2 will lose assistance over a four year period. A so-called safety net was created to limit the reduction per Member State (including regions phased out from Objective 1, but eligible for Objective 2) to not more than one third of the coverage of current Objective 2 and 5b regions. For example, the

study region of South Ostrobothnia in **Finland** is currently entirely covered by Objective 5b. As it will not qualify for the new Objective 1, the details of e.g. eligible regions and support levels in the new Objective 2 will be important decisions for the future regional development there.

Under the new **Objective 3** will be regrouped all activities of the ESF. Objective 3 aims at supporting the adaptation and modernisation of education, training and employment policies and systems. This objective is horizontal, unlike the other two new Objectives.

In addition to these major 3 Objectives, in agricultural terms, **rural development initiatives** remain possible under the new Objective 1 (under EAGGF *Guidance* funding) and, specifically outlined, under Objective 2 (incorporating certain areas currently defined under Objectives 1, 6 and 5b). Areas not so defined, as well as schemes under the present Objective 5a, will still be eligible for rural funding. This will be possible under the new rural development pillar of the CAP (market measures being the first pillar), financed out of the EAGGF-*Guarantee* fund (note: this rural development pillar, also covering agri-environmental measures, of the CAP has sometimes been dubbed as “Objective 0”). Also the LFA scheme, in addition to accompanying measures, currently financed under the EAGGF *Guidance*, will from year 2000 come under the *Guarantee* fund.

The **Cohesion Fund**, providing support for Greece, Portugal, Spain, and Ireland, will not undergo any substantial changes.

In order to be able to incorporate these elements into our scenarios and then into regional SAM models we have to collect all relevant information concerning our study areas and the changes they are facing due to the Agenda 2000 proposals in their Structural Funds expenditure. For example, in Finland North Karelia is ‘up-graded’ from Objective 6 to Objective 1 of a higher support level per capita. To which sectors, and in what proportion, of our regional SAM this insertion (positive shock) will be directed has to be carefully determined, most likely with the help of regional additional information. The situation of those regions is still an undetermined Objective status and support levels, eg. South Ostrobothnia, is still much more complicated. Sophisticated estimates and decisions are needed in these situations. For the time being, there are not available any definite, accurate and final information and decisions on these issues, probably only in the late autumn 1998 there will be some.

The CAP

The Agenda 2000 proposals for CAP are numerous and complicated, but also presented quite in detail in March 1998 EC Commission proposals.

The CAP effects have to be taken into account in our scenarios and regional SAM models in two different ways. Firstly, the institutional price cuts (cereals 20 per cent in 2000, milk 15 per cent in 2000-2003, and beef 30 per cent in 2000-2002) have to be incorporated in proportion of production volumes of these production lines in our study areas. So, they are changes in the value of production of cereals, milk and beef in the agricultural sector of our study region.

Secondly, the changes (increases) in direct payments have to be calculated based on the arable land area under cereals (hectares and average yields in the study area), and number of dairy cows and beef animals for milk and beef production. For example, in cereals, the area payment increases by 11,66 ECU/t (from 54 to 66 ECU). Concerning the premiums (direct payments) for dairy cows (more precisely, virtual dairy cows) and different beef animals, each Partner has to use the national premium levels, including both the EU basic and national envelope premiums, in each study area. These premiums vary, indeed, country by country: e.g. the dairy cow supplement premium from the beef sector will be only ECU 30,5 per virtual cow in Finland. These national differences have to be incorporated in our analysis in order to produce meaningful results, although we otherwise have agreed on not to allow too much exploitation of national flexibility and modulation.

3.3. Non-cohesion scenario

The non-cohesion scenario takes an alternative point of view to the distribution of funds. Here, total EU spending on Structural Policy and the CAP remains at the 1994-99 levels, but in the case of the study areas, Structural Policy Assistance is provided on a **per capita** level and CAP expenditure on a **per farm** level. The key characteristic here is, according to the non-cohesion name and concept, the *flat rate criteria*, i.e. in a certain year, all funds and subsidies per unit (an inhabitant, a farm(er)) are the same in all Member States.

In order to realise and execute this scenario in our analysis, we firstly take the total EU spending on Structural Policy and the CAP at the 1994-99 levels (see the sums in the Trend Scenario). Then, annual average sums of SP and CAP expenditure are divided by the entire EU-15 population, and that of the CAP expenditure by the total number of EU-15 farms. In this way, the SP expenditure will be ECU 65 per capita per year in 1994-1999 (ECU 144 100 million/370 million people/6 years) and for CAP expenditure ECU 5218 per farm per year in 1994-99 (ECU 244 652 million/7814 800 farms/6 years). Then these sums, ECU 65/capita and 5218/farm, have to be multiplied by the population and total number of farms, respectively, *in our study areas*.

This sum is the insertion (shock) to the regional SAMs (and to the selected sectors in them). Insertions will vary in 2000-2006 according to the changes in the number of inhabitants and farms in the study areas, and this variation should be based on the historical regional trends (e.g. in the 1990s). The expenditure, i.e. EU support, per unit (inhabitant, farm) remains the same in 2000-2006 in our analysis, based on the annual-average level of the 1994-99 spending.

In order to insert the elements of the three scenarios into our regional SAM models, it is essential to define the study-area specific figures for EU's *SP and CAP spending*. It should be quite straight-forward for the Trend and Non-Cohesion Scenarios, but the Agenda 2000 Scenario requires careful studying of SP and CAP changes at the Member State level, because there are important differences (e.g. in SF Objective areas, or CAP national envelopes in milk and beef production).

Another important study-area specific decisions have to be made concerning the *sectors* to which the injections/changes/shocks are directed. For the CAP changes, of course, there should not be problems, but for the Structural Funds study-area specific expertise is needed in order to know on which sectors certain SF changes are most likely to have major effects. This expertise we have gained in the earlier and on-going Tasks of the STREFF-project. The local authorities have been in the key position to provide suggested sectoral distribution of the structural funds.

4. Study region specific scenarios

4.1. Specification and construction of the trend scenario

This first scenario is an application and insertion of the 1995-99 trend in the structural funds and 1996-97 trend in the CAP expenditure of the region-specific relevant policy measures in the SAMs for the study regions. In practise, this means that the policy shocks to be inserted are rather neutral in terms of current expenditure levels, so no major changes are expected as the outcome of these shocks.

For Finland, the key to this scenario composition is to calculate the difference between the 1993 pre-EU membership domestic agricultural support level and the current level of expenditure. This calculation must be done in order to adjust the value of production prior to the EU membership to meet the change that has taken place after Finland has joined the EU. This difference is then used as a basis for constructing the shock to agriculture sector in addition to the share of the sector of the structural funds (production sector 1 in the SAMs). The other sectors will receive as a shock the current level of EU funds, which will be allocated according to the importance of each sector.

The problem with the use of 1993 value of production is also that it does not take into consideration the impact of the EU membership on the agricultural product prices. The average estimate of the fall in prices has been 40 per cent, but the level of production in year 1993 was lower than the average of the early 1990s, so the fall was estimated to be 30 per cent in 1993 compared to the average during the EU membership. By using this multiplier, and by using the information given by the Regional Business Centres regarding the support levels in 1993 and in 1997, the following calculations were carried out in order to adjust the pre-membership value of production to the membership level:

Figures as millions of FIM	South Ostrobothnia	North Karelia
Agr. returns (revenues) in 1993	2287	639
Less domestic subsidies in 1993	-287	-108
Net value of production	2000	531
less 30 per cent (EU effect)	1520	372
Plus subsidies in 1997	702	206
Agr. returns (revenues) in 1997	2222	578
Difference in returns (revenues)	-65	-61

We can note that the net effects of the membership, as measured by the last line, have been relatively modest, yet they have been inserted in the period 2000 shock as a base value due to the change in the value of agricultural production. We will assume that the change between 1993 and 1997 would also be valid in the year 2000.

However, following simplifying assumptions have been made in order to obtain more meaningful results. First, the sectors not receiving any additional EU support are assumed to be forestry, other primary production and financial intermediates for both study regions. This is a plausible assumption, since these sectors do not have significant employment effects, and they do not require major investments. For the remaining sectors, the allocation of funds is expected to take place according to each sectors' relative share of the total value of production. This takes place in the sectors other than those excluded from the distribution of funds. This assumption is based on the nature of the structural funds: the allocation of funds takes place to develop the regional economic activity, thus the allocation by the importance of the sectors. Second, the reason for excluding some sectors of production from the EU support is also based on the assumption that these sectors do not attract capital from the structural funds because these sectors are less labour-intensive than those chosen for support. These sectors do not generate employment or otherwise increase the regional economic capacity.

4.2. Specification and construction of the Agenda 2000 scenario

For the Agenda 2000 scenario the two regions will have different scenario specifications as a consequence of the change in North Karelia from Objective 6 to Objective 1 of the structural funds. No change in funding is expected to take place in South Ostrobothnia as its status in the new Objective 2 is assumed to correspond to its old status under Objective 5b. In the absence of other changes the proposed Agenda 2000 changes take place through agricultural production.

However, in reality the changes in agricultural prices, gross returns and direct support are taking place with a lag during the first four years. The change is taking place according to the following estimate for the first three years under Agenda 2000 in regional agriculture: In the first year the reduction is only 5 per cent. In the second year, the reduction increases to 7,5 per cent and in the third year to 9 per cent. Only in the fourth year, and onwards, the full level of 10 per cent is reached. This full level is then used as our shock in 2005, as we want to measure the change between 2000 and 2005.

For North Karelia the construction of Agenda 2000 scenario is not as straight-forward as it was for South Ostrobothnia. The changes proposed in the CAP reform of the Agenda 2000 are also negative as were those in the case of South Ostrobothnia, but it is compensated by the changes caused by the move from Objective 6 to Objective 1 of the structural funds. The North Karelia Regional Council has estimated the following changes in the EU structural policies to take place after the change:

Table 1. Proposed changes in the current EU structural funds due to Agenda 2000 in North Karelia.

Sector	% change in support
Agriculture	35
Industry	40
Social sector	100

These figures were used to construct the scenario in the following way. The net support to the agricultural production was calculated as the net value of the increasing rate of the reduced agricultural price support as in the case of South Ostrobothnia, and the current level of structural funds support. This was multiplied by 1,35 as a consequence of the increase following the change from Objective 6 to Objective 1. The respective shock vector for agriculture over the period from 2000 to 2005 could then be summarized as is done in the Table 2. Note that the shock for the year 2000 also includes the change between 1993 and the current EU CAP expenditure.

Table 2. The Agenda 2000 shocks to agriculture in North Karelia, millions of FIM.

Sector	Year	2000	2005
Reduction/increase in CAP expenditure			
Agriculture		-61	-37
Structural funds to agriculture		135	135
Net shock/year		74	98

As we can see, the net shock in agriculture is different from that of South Ostrobothnia, since we will obtain a positive shock in the vector. Because of the limitation given by the structure of the SAM used in the study, we have been forced to use a net vector shock only, instead of shocking the agricultural production by the price change and the agricultural households by the change in transfers. The problem with this approach is, of course, that the multipliers between agricultural production and other accounts used are different from those between households and other accounts. Unfortunately, as there is no more detailed data available regarding the household income by groups, such as the agricultural households, the shock to an aggregate household account would not capture these effects properly. However, under this constraint the use of one single shock in the agricultural production is likely to provide more realistic results than two separate shocks, one for agricultural production and one for households.

4.3. Specification and construction of the non-cohesion scenario

For the non-cohesion scenario, the method of calculation is simple: the expenditure levels per farm and per capita on annual basis were given (ECU 5,218 per farm and ECU 65 per capita). The main task was to estimate the number of farms and the trend in population growth in the two regions to be able to calculate the total support received. As this is the “flat rate” scenario, there should be no region-specific Objectives, which would have any role in the equal distribution of funds.

Another assumption that was made was that the division of structural funds would be different from the present in order to serve regional employment etc. objectives in the most efficient way; according to the idea of a target scenario. Whereas the current allocation takes place with a strong emphasis on the agricultural sector, we assume that the future allocation will take place according to the value of production in each of the production sectors. This is a plausible assumption, as it is based on the employment and development possibilities by each of the production sectors, which is one of the main goals of the structural funds. By allocating the funds this way the authorities can be seen to contribute to regional development on a more efficient basis.

Both areas have suffered from migration to other parts of Finland in the past, but recently the population has more or less stabilised in both regions. For the purposes of estimation the round figures for population were used in both regions: 200 000 in South Ostrobothnia and 175 000 in North Karelia. This gives the respective support of FIM 78 million and FIM 68 million. The insertion of the structural funds is done according to the same principles that were used in the previous scenarios: The total funds were allocated according to the relative importance of each production sector. Again, sectors with little employment effects were left out of the allocation. In addition, the strong support to agriculture was assumed to be compensated in the future with similar an allocation similar to the other sectors. The relative importance of the value of production was used as a basis for allocating structural funds to the agriculture. This means that the expenditure is reduced quite significantly from the levels that were given in the other scenarios.

The number of farms in the year 2000 and onwards in South Ostrobothnia was estimated to be 9700. The number of active farms was over 12600 in 1995, but according to the recent development we have assumed that the number is likely to decrease, and, consequently, the figure 9700 would represent some kind of average over the period from 2000 to 2005. By using this figure, the CAP expenditure on an annual basis would be FIM 304 million between 2000 and 2005 in South Ostrobothnia.

In general, this division would mean that the structural funds in North Karelia would be reduced by over 50 per cent from their current value of some FIM 138 million to FIM 68 million. Basically this means that the shock is rather similar to that of the trend scenario with the exception that the values inserted in the shock vector are higher than those used in the trend scenario. The number of farms in 2000 was estimated also by using the recent trend as a starting point. The 1995 statistics show that there were 4,532 active farms in North Karelia. This figure was then used to estimate the future number of farms. If the trend of decreasing the number of farms is expected to continue, the round figure of some 3350 farms in the year 2000 is not far from reality. However, the support received would be equal to FIM 105 million, which is very close to the 1998 EU support to the agricultural production in North Karelia.

Since both areas have a relatively small and declining number of farms, the effects of the flat rate approach reduce the CAP support from the current level. The same holds

for structural funds, since both regions have earlier received more support than regions on the average in the EU.

5. Analysis and results of the scenario effects

5.1. South Ostrobothnia

For South Ostrobothnia, **the trend scenario** produces the rather expected results regarding the agricultural production. As explained in the previous chapters, the change resulting from the EU membership has reduced the value of agricultural production. In the trend scenario, we have only inserted the reduction to the agricultural production. Since the trend assumption means that the initial shock in the CAP expenditure will be equal to zero, the result is that the impact is equal to the change between the 1993 level and the Agenda 2000 proposal regarding CAP support.

Most of the effects of the trend scenario in the production sectors are negative. Despite the positive, yet relatively small, allocations of structural funds to some productive sectors, the strong linkages of the agriculture with other sectors are also affecting other production sectors. This leads to only minor positive changes. Since we have made the assumption regarding the sectoral allocation of the structural funds, it may well turn out that a minor reallocation would have cancelled out the positive effects.

The effects on the factors of production (capital and labour), as well as on the firms and households, are also negative. Since there is a decrease in the value of the production, the demand for inputs decreases. Also, since the share of agriculture is very high in South Ostrobothnia, the revenue of the firms also falls as a result of the overall stagnation that takes place. The households are also affected by the reduced demand for labour, as well as by the direct income effects of the households working in the agricultural production.

The Agenda 2000 scenario creates the largest negative impact on agriculture of the three scenarios for South Ostrobothnia. This scenario also produces a strong negative impact on household income, but even higher on the revenue of the firms. However, it must be noted that the impact is approximately the same size for both households and firms, but the relative size of the sectors means that the percentage change for firms is more than double that of the households.

The non-cohesion scenario produces results, which are not very different from the trend scenario in South Ostrobothnia. The major changes take place in some production sectors, as the most efficient allocation principle of structural funds reallocates the funds differently from the trend scenario.

Again, as the shocks are relatively small, also the impacts are relatively small. It is very difficult to draw any conclusions as the changes are very small. However, the general conclusion is that the decrease in the value of production in agriculture is causing a negative impact on the household income and the revenue of the firms, as

some of the other production sectors experience positive shocks, yet the firm revenues and household income fall. The positive impact on productive sectors can be seen through the allocation of structural funds. The largest allocations take place on sectors having largest values of production and strong linkages with other productive sectors, which creates spillover effects.

5.2. North Karelia

In **the trend** scenario in North Karelia the reduction in the value of production in agriculture is compensated so that the structural funds compensate for the reduced value, making the shock positive despite the negative impact of the EU membership on the value of the agricultural production. As a consequence of the structural funds the agricultural production would seem to have benefit from the change in the support schemes. The overall growth effects are positive, not only in the productive sectors, but also for the inputs and household income and the firm revenues. This stresses the importance of the structural funds in the development of the region.

The results of the **Agenda 2000** scenario are positive, although the CAP funds are reduced. This is because of the strong support to agriculture through the structural funds. There is a slight increase in the value of agricultural production compared to the trend scenario. This indicates the importance of the structural funds in North Karelia.

The comparison between the Agenda 2000 scenario and the trend scenario would seem to suggest that local authorities would support the current proposal, if the structural funds would increase as suggested. The mixed economy of North Karelia would receive more structural funds than at present, and, in addition, it would not suffer dramatically from the fall in the value of the agricultural production.

The **non-cohesion** scenario in North Karelia represents the expected decrease in the funds available. However, the shock remains positive so the major change compared to the other two scenarios is that the growth of the production across the sectors is less than according to the other two scenarios. However, there are exceptions to this as well, as the value of production in the forestry sector increases more than in the other two scenarios. However, the change is again so small that the increase may be purely coincidental as a consequence of the allocation of the structural funds. The general observation regarding the non-cohesion scenario is that the structural funds available decrease significantly, from nearly FIM 140 million to FIM 68 million. This would be partly compensated by an increase in the CAP support, still leaving North Karelia with less funds available than according to the other two scenarios.

5.3. Comparison of the scenarios for study regions

The results for South Ostrobothnia and North Karelia are different because of two major factors: the structure of the production and the level of support received. The results obtained by the analysis support the expectations regarding the possible consequences of the alternative policy choices. In South Ostrobothnia all three

scenarios produce negative effects on the value of the agricultural production, whereas in North Karelia all scenarios produce positive effects. There is a major contrast in the allocation of the structural funds between the regions, as North Karelia has a very high level of support, both currently and also according to the Agenda 2000 proposal.

According to the trend scenario, most sectors in South Ostrobothnia experience a decrease in the value of production (Table 3). The negative effects are relatively small, if contrasted with the Agenda 2000 scenario. In North Karelia, the difference between the two scenarios is less obvious, although Agenda 2000 scenario does generate quite substantial output effects through Structural Funds. This has to do with the proposed change from Objective 6 of the structural funds to Objective 1 with a considerably higher level of support. Whereas South Ostrobothnia would lose according to the current Agenda 2000 proposal, North Karelia would benefit from the change. Although there are no exact official calculations available regarding the change in the funds, the estimate presented here is based on the figures given by the North Karelia Regional Council.

Table 3. Output effects of scenarios in North Karelia and South Ostrobothnia, FIM million.

Funds	North Karelia			South Ostrobothnia		
	Trend scenario	Agenda 2000 scenario	Non-cohesion scenario	Trend scenario	Agenda 2000 scenario	Non-cohesion scenario
Total	239	293	216	-74	-265	21
Total %	25,07	37,30	21,92	0,0	0,0	0,3

The non-cohesion scenario, which has been introduced as a threat scenario, provides negative results regarding the value of production in the productive sectors and income losses in the other sectors in both regions. However, in South Ostrobothnia the negative effect would be lower than according to the other two scenarios, so the province would actually benefit from this change. This has to do with the increase in structural funds, which seem to play an important role in this scenario. In North Karelia the effect still remains positive, but the impact is lower than according to the other two scenarios. This is because the total amount of structural funds would be lower than the current level of funds, which have been received in the province since EU membership in 1995.

The employment effects in the two regions are also different (Table 4). As can be seen, the employment effects of CAP expenditure are greater in North Karelia, in South Ostrobothnia the reduction in CAP expenditure is cutting the agricultural sector employment. When measured in terms of employment effects, the Agenda 2000 scenario would seem to benefit North Karelia most, whereas South Ostrobothnia would benefit most from the realisation of non-cohesion scenario.

Table 4. Employment effects in North Karelia and South Ostrobothnia, number of persons.

Funds	North Karelia			South Ostrobothnia		
	Trend scenario	Agenda 2000 scenario	Non-cohesion scenario	Trend scenario	Agenda 2000 scenario	Non-cohesion scenario
Total	633	758	508	-303	-935	-108
Total %	0,60	1,20	0,81	0,0	0,0	0,0

6. Conclusions

Agenda 2000 has set the framework for the future of EU policies. In Finland the expected effects of Agenda 2000 are clearly bipartite. Agenda 2000 proposals for the reform of the CAP with lower prices and partial compensation only for income losses are threatening the continuation of disadvantaged Finnish agriculture. On the other hand, the reform proposals of EU regional policy (structural funds) have been received more favourably in Finland, especially due to the fact that the current Objective 6 areas are promised to be included in the new Objective 1 of a considerably higher support level. This bipartite situation is also reflected in the results of the scenario analysis.

According to the Agenda 2000 scenario, agriculture in South Ostrobothnia would suffer from a considerable loss compared to the present situation. The proposed fall in the gross return of agricultural production (including sales income and direct support) would in fact shift almost in full in the value of future production. The overall effect on productive sectors in the region would also be negative, as the structural funds are assumed to remain at the current level as the current Objective 5b status of South Ostrobothnia is replaced by the new Objective 2 for some parts of the region.

For North Karelia, the proposed change from current Objective 6 to the new Objective 1 would mean a considerable increase in structural funds. The results of scenarios, presented in the previous chapter, support the view that North Karelia would receive more support according to Agenda 2000 than at present. Even with the negative effects of the declining CAP support, the net effects on the agricultural sector remain positive due to a substantial increase also in those structural funds directed mainly at the agricultural sector (but not necessarily at agricultural production as such). This is different from South Ostrobothnia, where the fall in the CAP support reduces the value of production so that the structural funds remaining at the current level are not able to compensate for the reduction.

In the trend scenario there is also differences between the two regions. North Karelia enjoys of a more positive impact on the productive sectors as well as on the households and firms than South Ostrobothnia, because the structural funds received in North Karelia are higher than those in South Ostrobothnia. It must be taken into consideration that the basic shock as a consequence of the EU membership has also been inserted into the figures. If this basic shock was not shown, the basic impact according to the trend scenario would remain positive in both regions. The overall net

effect of the EU membership on both study regions would seem to have been less negative than perhaps was assumed prior to the membership.

The non-cohesion scenario represents the most far-stretched vision of the future as it is strictly against the strong EC Commission commitment for social and economic cohesion in the EU. The scenario, however, does not produce surprising results for the two regions in Finland. In South Ostrobothnia, where the current level of structural funds is relatively low under Objective 5b, the future allocations, according to the number of farms and the size of population, do not change significantly. In North Karelia, where the current level of support is high, and, according to the Agenda 2000 proposal, is expected to become even higher, the non-cohesion scenario produces a threat compared to the other two scenarios.

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