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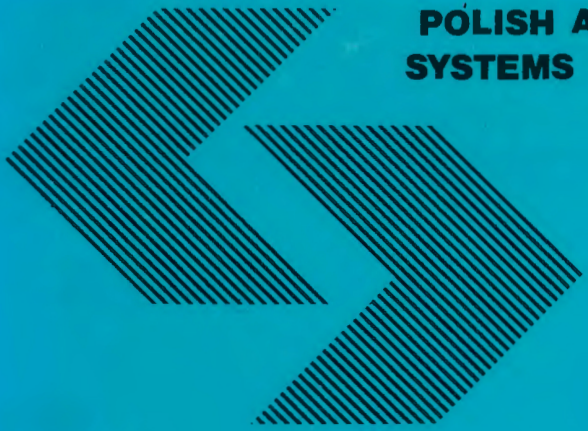


STRATEGIC REGIONAL POLICY

A. STRASZAK AND J.W. OWSIŃSKI
EDITORS

PART II

WARSAW 1985

SYSTEMS RESEARCH INSTITUTE
POLISH ACADEMY OF SCIENCES

STRATEGIC REGIONAL POLICY

Paradigms, Methods, Issues and Case Studies

A. Straszak and J.W. Owsiński
editors

Documentation of the workshop on "Strategic Regional Policy", December 10 - 14, 1984, Warsaw, organized by the Systems Research Institute, Polish Academy of Sciences and the International Institute for Applied Systems Analysis

PART II

WARSAW 1985

IV. CASE STUDIES

FINDING STRATEGIC LABOUR MARKET POLICIES FOR LOWER SAXONY VIA SYSTEMS ANALYSIS

K.P. Möller

ISP Hannover

As an example for a dialogue between System Analysts and so called "regional decision makers" the possible political reactions induced from a "Labour Market Analysis" with the final goal of finding Strategic Policies against unemployment are described.

I. ACTORS IN THE DIALOGUE

1. Government of Lower Saxony:

Lower Saxony is a region in Northern Germany, one of 11 "states" of which the Federal Republic of Germany is formed.

Head of the State Government of Lower Saxony is a Prime Minister, followed by 12 other ministers. The office of the Prime Minister consists of a small "planning staff" which tries to find and formulate regional strategic policies to solve the special problems of the region. In some case the planning staff is using the help of a scientific institute.

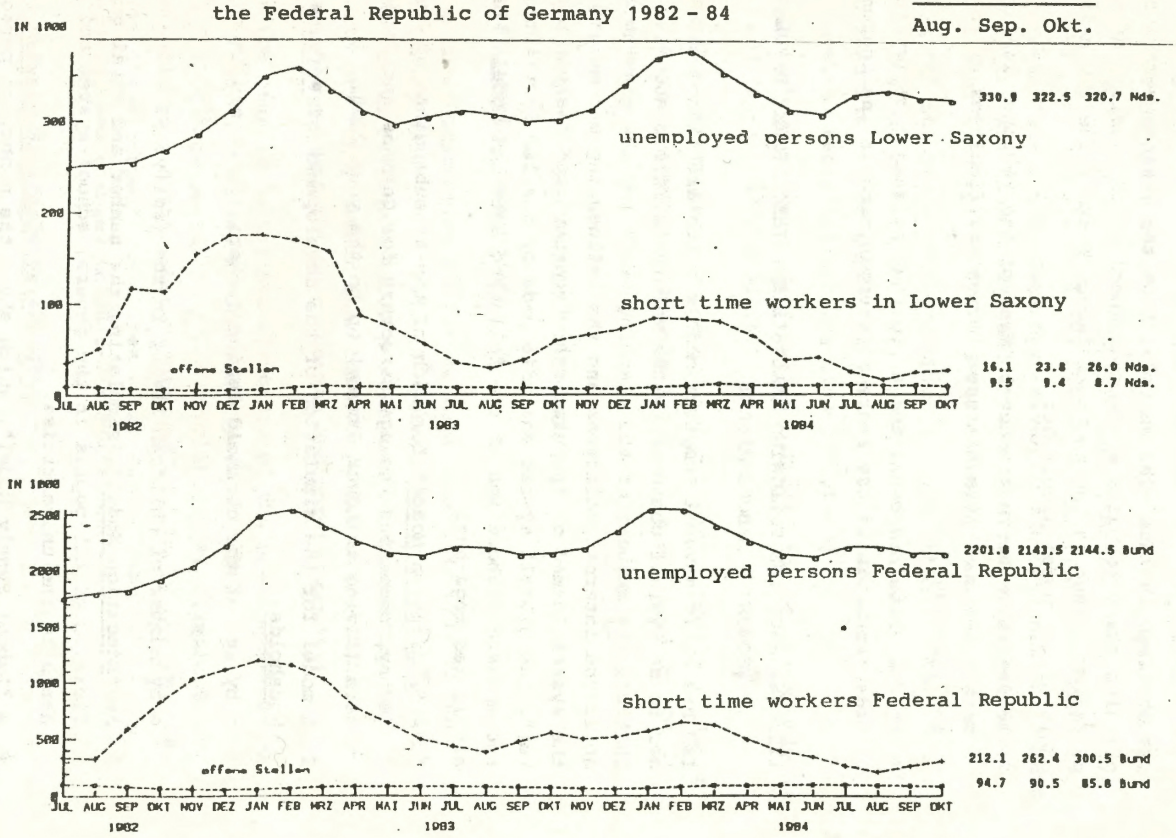
Since 1975 Lower Saxony has unemployment problems. In October 1984 approx. 230 700 persons in Lower Saxony are unemployed, 11% of the 3 million persons participating in the regional labour market (Figure 1).

2. ISP Institute in Hannover

ISP-Institute (Institute for Applied Systems Analysis and Prognosis) is a small institute (8 scientists), situated in Hannover, the Capital of Lower Saxony. It was founded in 1975 by Eduard Pestel, one of the leading system analysts in the world.

— Figure 1. Unemployment situation in Lower Saxony and the Federal Republic of Germany 1982 - 84

in 1000



II. THE PROBLEM AREA FOR THE STRATEGIC POLICY

ISP obtained in late 1983 an order from the state-government planning staff to build a computer model which consists of all parameters inducing the regional labour market. The two main goals of the model should be:

1. To describe the future development of the regional labour market and show possible unemployment difficulties up to the year 1995,
2. To formulate proposals for a regional strategic policy in order to minimize the share of unemployment in the region.

III. ISP MADE THE FOLLOWING ANALYSIS FOR THE SYSTEM: POPULATION - ECONOMY - LABOUR-MARKET

ISP has built several computer models which are linked together to an overall computer system mainly to inform and also instruct the members of the planning staff and the government about the internal relations and the influencing parameters of the system formed of "population", "economy" and "labour market". The overall system analysis made by the ISP Institute, encompassed elaboration of the following detailed models which are linked together:

1. A "Population Model" for each of the 47 subregions of Lower Saxony, computing the age structure for Germans and foreigners (living in Lower Saxony) up to the year 2000.
2. A model for the simulation of the development of Private Housholds
   - o by age of the houshold leader (generally the man in the family),
   - o by number of children living in the family.
3. An "Education Model", simulating the number and final qualification of all pupils in the general school-system and students in the universities.
4. A "Labour Supply Model", which shows the number of persons

participating in the labour market, driven by the age-and sex-structure of the population model and the qualification level of adult women.

5. An "Economic Model", which is computing the sectoral growth rates of the share of the GRP, diverted from an Input-Output Model for Western Germany, driven by the consumption patterns of private households (see 2) and export-import relations, coming from the "Mesarovic-Pestel-World-Model".
6. A "Labour Demand Model", which is simulating the demand for labour force from the above mentioned economic model, via a specific labour input per unit of GRP (productivity and the average sectorial working time per year.
7. A "Labour Market Model", which balanced the labour supply (4) and the labour demand (6).

Furthermore proposals for a strategic regional policy to lower the share of unemployment were asked to be provided by the institute.

IV. RESULTS OF THE MODEL SIMULATION

1. Population Development

The total population figure in Lower Saxony is only slightly declining from 7.2 to 7.1. 10^6 persons up to the year 2000. The losses of around 15000 persons per year resulting from mortality being higher than fertility, are nearly fully compensated by immigration of German and foreign persons.

On the other side the age structure of the Lower Saxonian population is changing dramatically /see Figures 2 and 3). The so called "age pyramid" of the population has changed to an actually more bottle-shaped form and will be in the year 2000 more "tree-shaped", which means the former basement of the pyramide has changed to just a small stem.

2. Private Household Development

The growing part of the population aged between 20 and 70 years

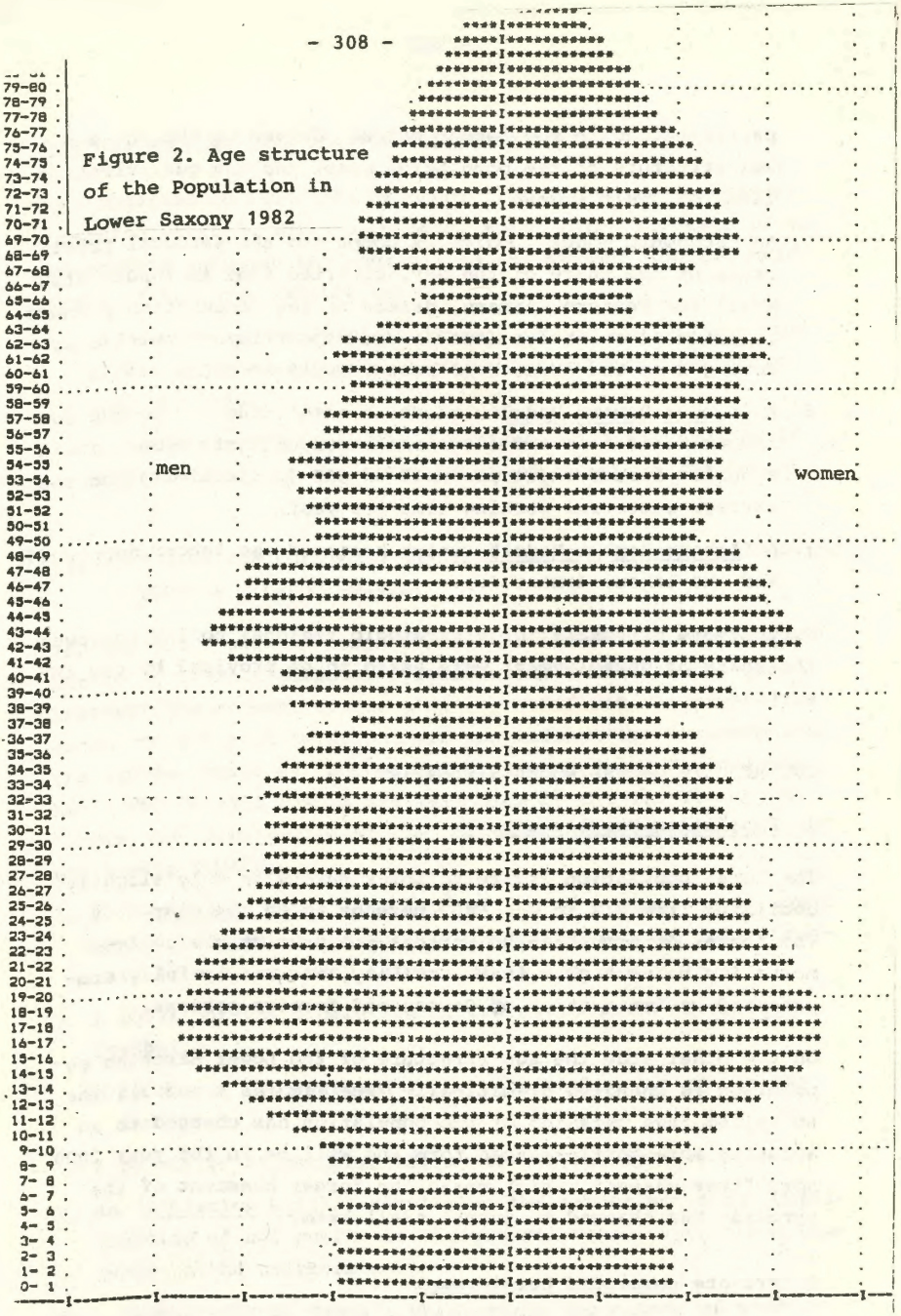


Figure 2. Age structure of the Population in Lower Saxony 1982

SUMMEN

MAENNER	3313094
FRAUEN	3638640
GESAMT	6951734

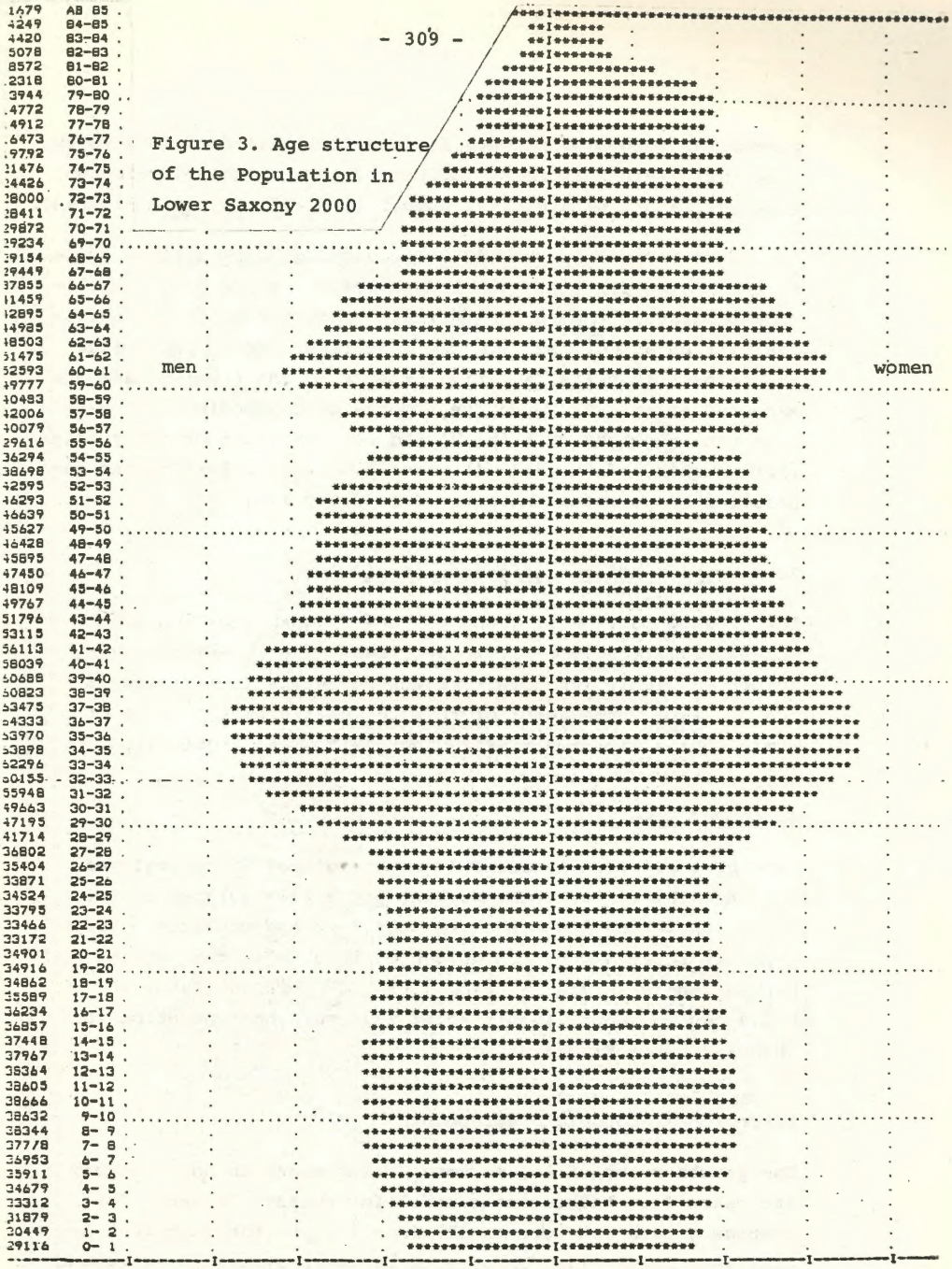


Figure 3. Age structure of the Population in Lower Saxony 2000

pushes the number of private households by 19% from 1980 to the year 1997. This year marks the top of the houshold development in Lower Saxony with a total number of 3,163. 10^6 (see Figure 4).

From 1984 to 1997 approx. 420000 households more must be supplied with dwellings and other durables. In spite of the declining population the regional final demand for goods and services will be stimulated from the demographic development side in the next 13 years. Negative impacts to the final demand are expected after 1997, when the numbers of households will decline too, together with the second negative wave of the yearly birth number (after 1963-74) induced by the smaller second generation of potential mothers. born after 1974.

2. Education and qualification level

The growing portion of young persons frequenting High Scools und Universities (see Figure 5), leads to a steadily growing number of highly (and overly) educated adults (see Figures 6 and 7). As a consequence of this the participation ratio of women in the labour market is increasing (see Figure 8).

4. Labour supply

Working population is divided into employed and unemployed persons. The ratio of the working population related to the total population depends on the age, sex and education structure. In Lower Saxony the number of numbers of the working population is increasing from 3.08. 10^6 persons (1982) to 6.213 10^6 persons (1990). After 1990 working population is shrinking (see Figure 9).

5. Regional Economic Development

The growth rates of the sectoral value added in Lower Saxony are taken from the economic model for Western Germany. The average growth rate of the GRP from 1983 to the year 2000 is 2.1% (see Figure 10). Three more business cycles are simulated

Figure 4. Comparison of the 1982 and the 2000 age structure of the population in Lower Saxony

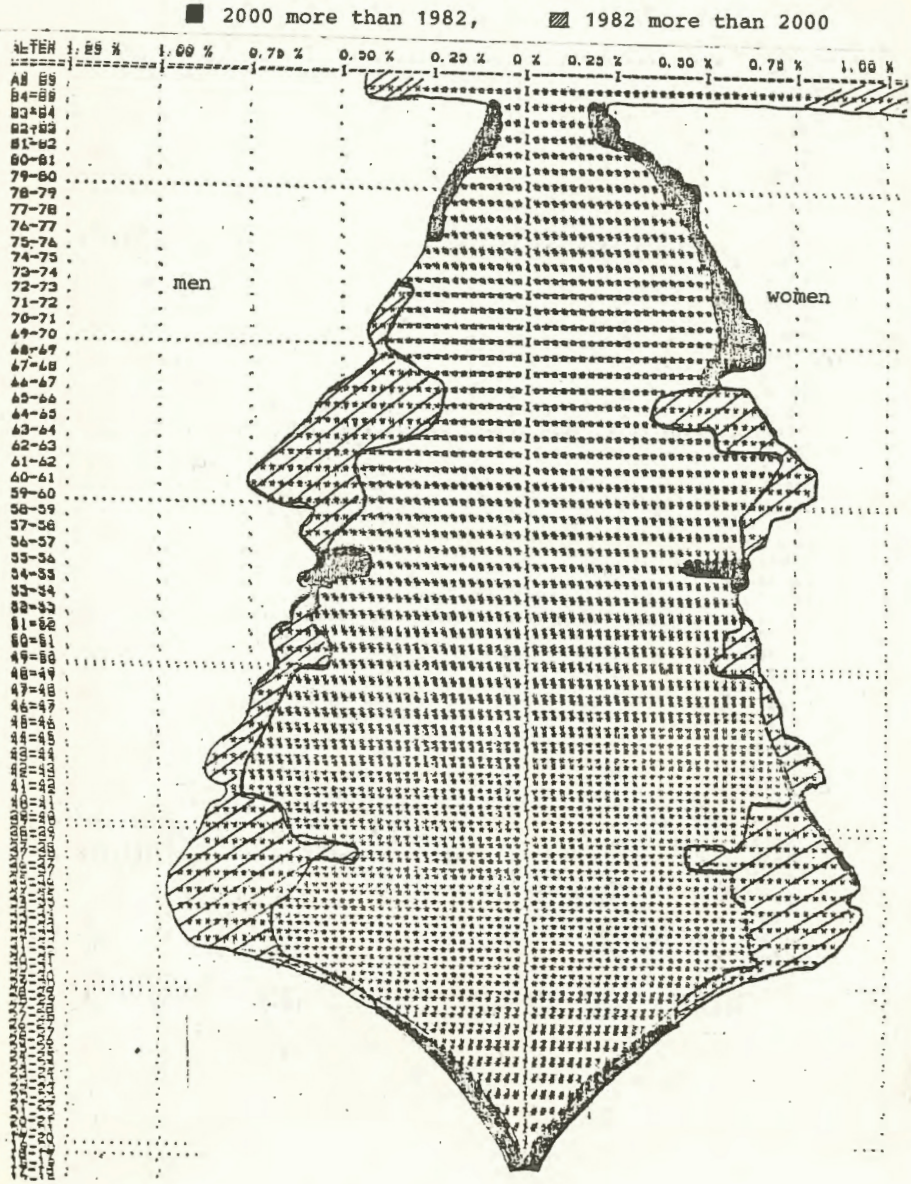


Figure 5. Persons leaving university and college in Lower Saxony 1970 - 2000

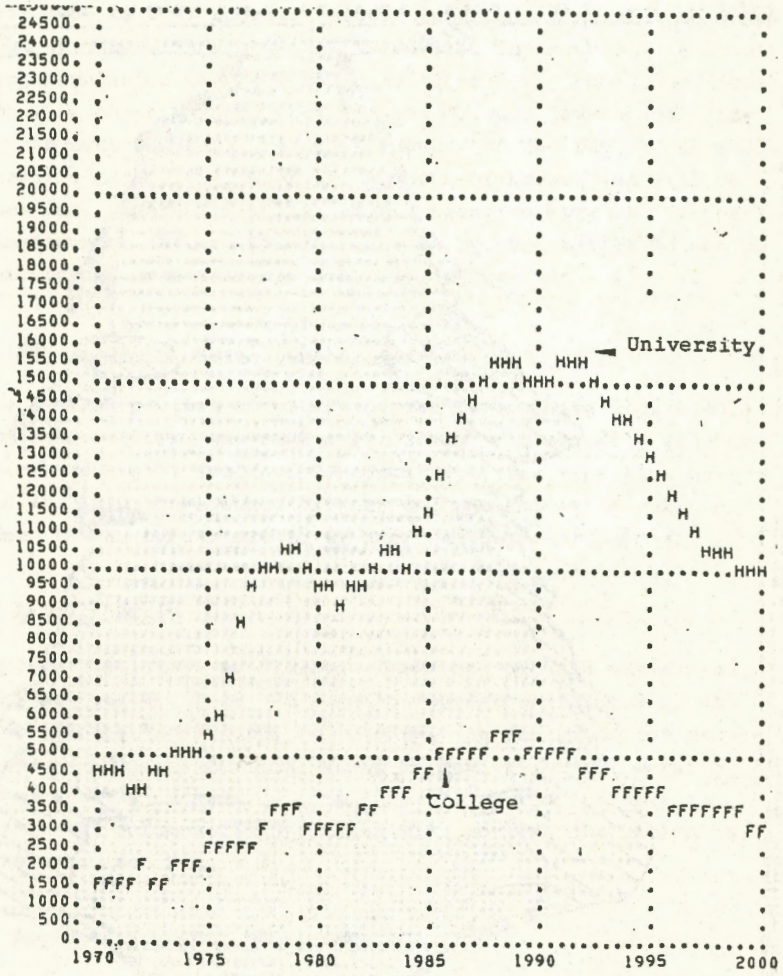


Figure 6. Final Qualification of adults in Lower Saxony (University and College) from 1970 to 2000

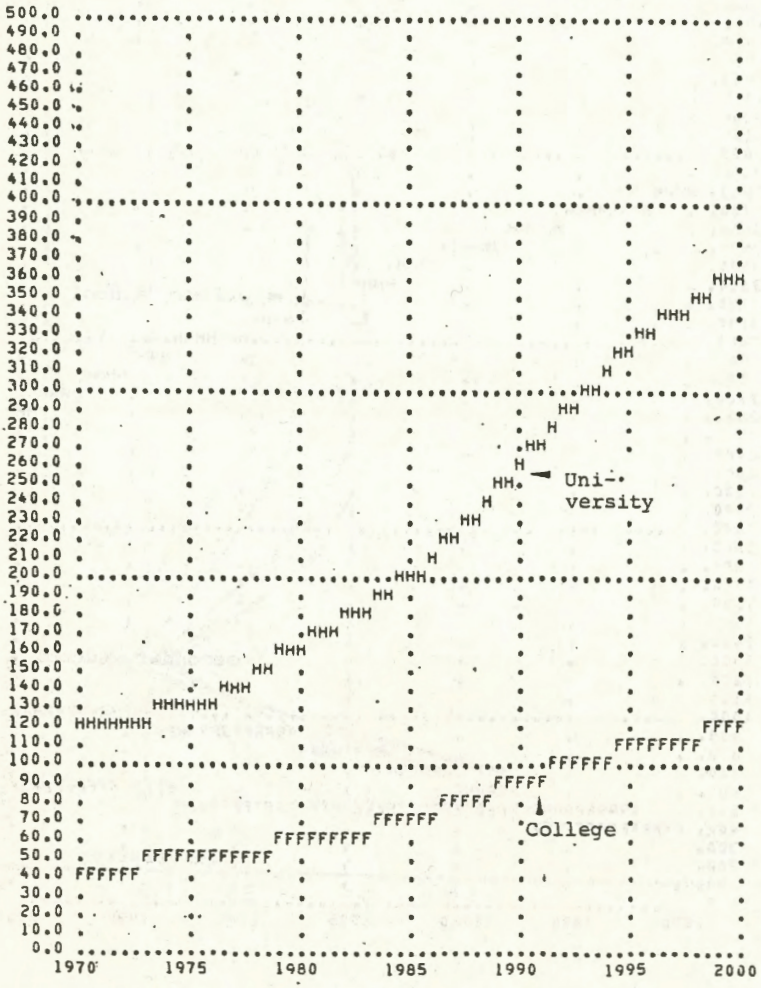


Figure 7. Final Qualification of the adults in Lower Saxony (primary, secondary and universing education) from 1970 to 2000

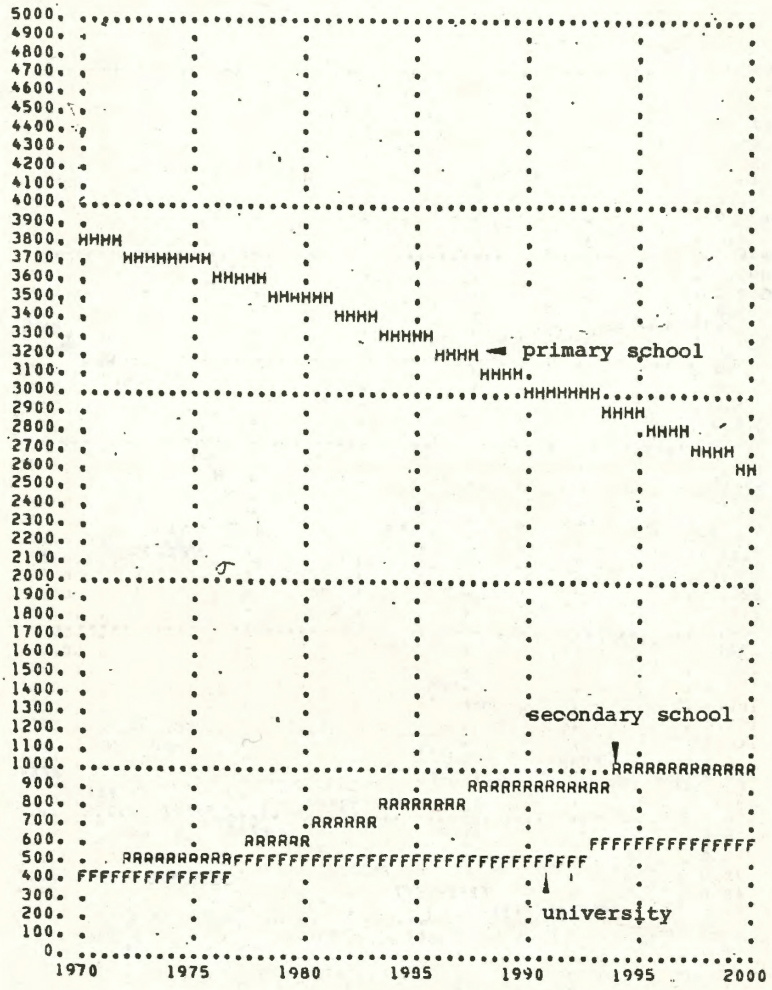
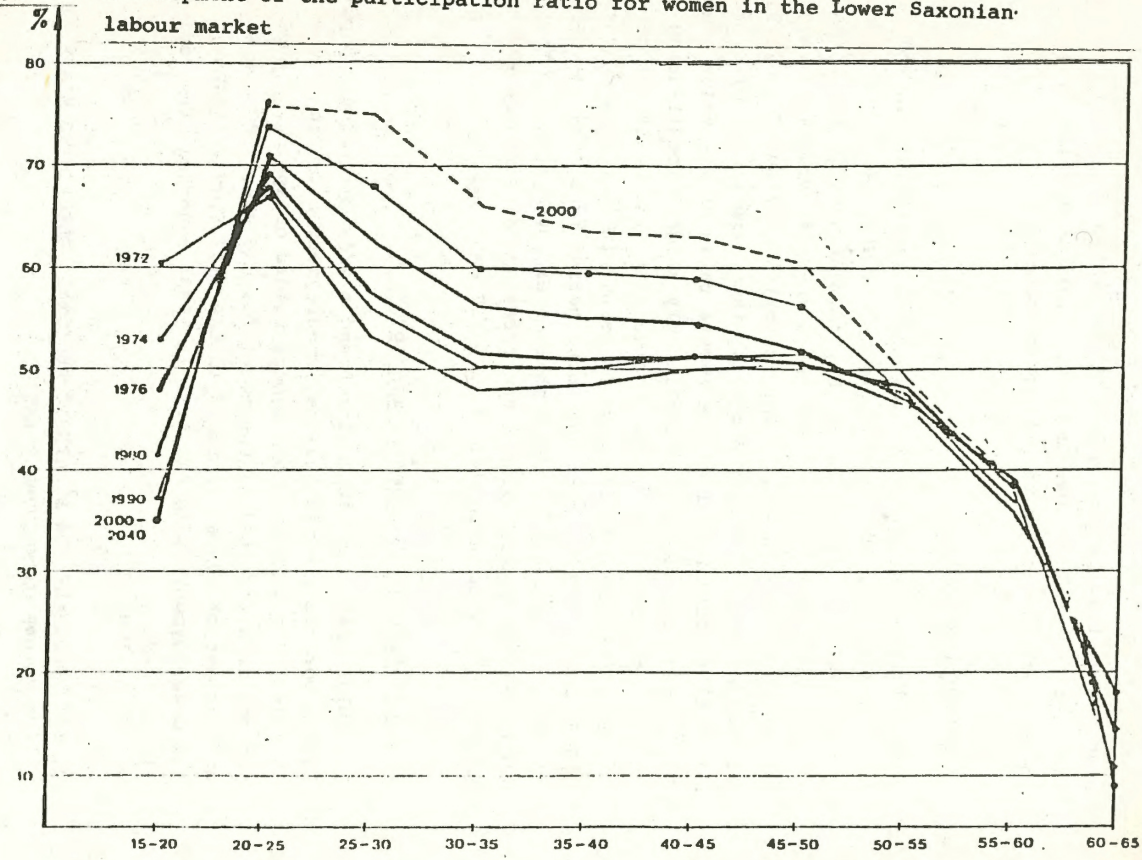


Figure 8. Development of the participation ratio for women in the Lower Saxonian labour market



with depressions in 1989 and 1994. After 1997 the annual growth rates of the GRP are lowering hence final demand is shrinking induced by the decline in private households.

6. Labour Demand

Sectoral labour productivity is, with a growth rate around 3%, by 1% higher than the growth rate of the GRP. Hence the overall labour potential is shrinking. A permament working time reduction is necessary to stabilize the number of employed persons. The average yearly working time is shrinking from 1734 h (1983) to 1623 h (1996). Hence productivity rates are linked by a sectoral elasticity factor to the growth rates of the value added the number of employed persons is only slightly oscillating with the business cycles. In periods with high growth rates (1986) 40000 persons more than in years with zero growth rate (1989) are employed. Over the total period from 1983 to 1995 there is no increase in the number of employed persons. The figure is oscillating within the frontiers of a minimum of $2.731 \cdot 10^6$ and a maximum of $2.793 \cdot 10^6$ employed persons.

7. Simulation of the unemployment problem

A stable demand for labour force and a growing "working population potential" enlarges the unemployment ratio in the next 10 years. The maximum unemployment figure of approx. 478000 persons is calculated by the model for the year 1990. This is an increase of 50% as compared to the 1983 figure (319000). The unemployment ratio is 15.5% in 1990, compared with "only" 11% in 1983.

V. ISP PROPOSALS FOR STRATEGIC REGIONAL POLICIES TO MINIMIZE THE FUTURE UNEMPLOYMENT RATIO

ISP stated that it seems not to be possible for the regional government in a market oriented system to influence via regional policy the following parameters of the labour market system:

Figure 9. Number of working population in Lower Saxony from 1980 to 1995

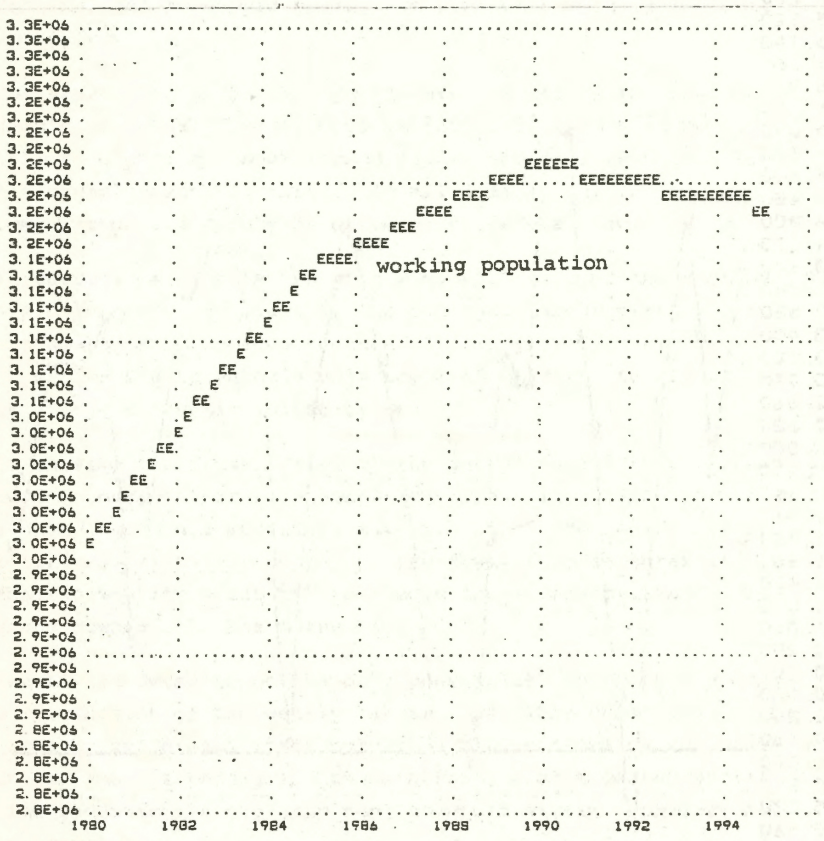
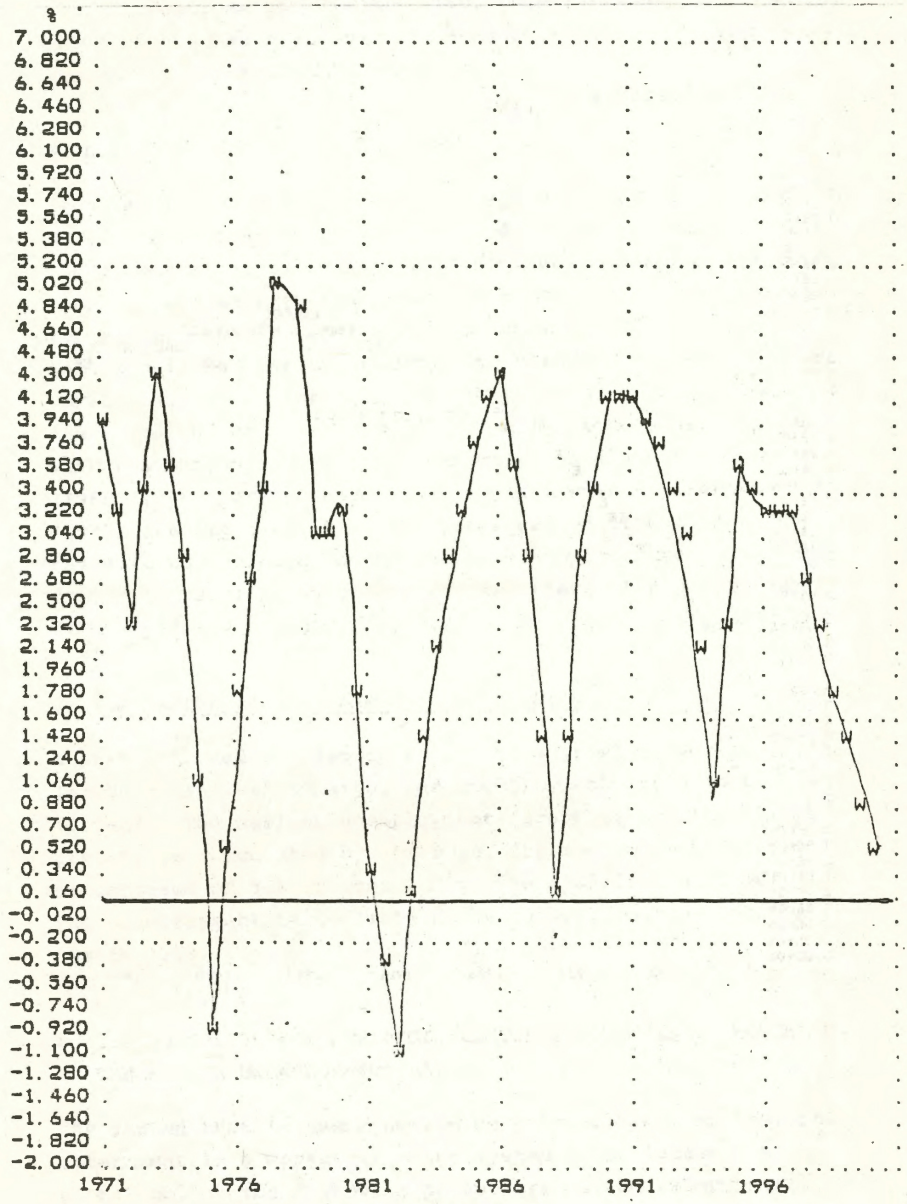


Figure 10. Growth rates of the Lower Saxonian economy from 1970 to 2000



1. The age structure of the German population
2. Higher education, especially for women
3. Development of sectoral productivity in the regional economy.

After this first stage of the analysis the members of the planning staff and the State Government must learn, that the tools for regional strategic policy are very weak in a market oriented system.

The search for affectable parameters led to the immigration problem in Lower Saxony. More immigration of foreign persons will enlarge the labour market supply and will result in higher unemployment. In this field all limitations for future immigration could only be effected by federal law.

Furthermore a stimulation of the growth rates of the economy has only positive impact to the regional labour market, when the yearly surplus is more than 5%. All growth rates lower than this figure enlarge only the productivity via higher usage of the production capacity.

To enlarge the growth rates of the GRP by such extent is also hardly possible for a regional gevernment in a market oriented economy, here all municipal authorities of the region are in a hard competition to draw the few newly founded enterprise to their community while 10 times more local enterprises go bankrupt nowodays in the meanwhile.

Finally it seems to be the only possibility to propose a general reduction of the weekly labour time. This could not be ordered by state-law, it is only possible to convince the trade unions and the enterprise associations, that a faster working time reduction is the only tool to avoid severe unemployment problems.

Table 1 shows the results of the simulation with various assumptions of weekly working time reductions from an average of 40 to 35 hours.

Unemployment could not totally disappear via working time reduction, but the model results show, that, after a sharp decline

from 1985 to 1988, the ratio will not be higher than 10%. There is much hope, that after 1995, when the working population is declining, the unemployment problem is solved. But nobody knows exactly what will happen with a national economy where not only the population but also the number of private households is shrinking faster and faster. There is only a small hope, that the number of the working population is declining faster then the number of the private households, creating demand for goods and services.

Table 1:

Impact of Regional Economy Policy
on the unemployment

average yearly working time (h)		unemployment ratio (%)	unemployed persons (1000)
year:			
1983 (data)	1734	10.9	319
1989 (model)			
Reference	1685 - 0.5%	15.5	475
Case a)	1630 - 0.9%	13.9	426
" b)	1523 - 2.0%	9.9	303

a) working time 35 h weakly for full-time employees is introduced already in 12 steps from 1984 to 1995

b) working time of 35 h weakly for full-time employees is reached already in 1988

DISCUSSIONS

Paper by K.P. Moeller

Discussions participants: D. Boekemann, G. Bianchi, K.P. Moeller.

The question of long-term implications of the modelling study results was analysed, especially from the point of view of the demographic situation. Thus, possible changes of in-migration rates were discussed together with their impact on both employment and demand, and with their dependence upon the appropriate legal regulations. It turned out that the model can incorporate most of these aspects.

Another question concerned the input/output core model used in the modelling study. This model was said to contain 11 numerically distinguished sectors.

Paper by G. Bianchi

Discussion participants: R. Espejo, L. Lacko, U. Loeser, G. Bianchi.

First question concerned the region definitions used, i.e. the distinction of "physical" and "random" spatial units. Thus, the latter ones may not refer to physical composition of space, and are often said to be formed arbitrary on some other premises, like e.g. states in the U.S.A. or regions in Italy, but irrespective of definitions such entities which are hierarchically located between the family and the state are to a large extent arbitrary determined.

Then the question on the kind of variables accounted for in factor analysis was asked. There were 40 variables such as: numbers of university professors and of R and D researchers, number of scientific journals, activity in promotion of international trade, etc.

The last point concerned the IRPRT's role in allocation of state funds to particular regions. Inasmuch as the allocation is a result of bargaining and negotiations, conflicts were said to be treated as a normal part of the planning procedure. Regional authorities are responsible for the conduct of negotiations,

and it is for their needs with that respect that IRPET prepares background information.

Paper by J.W. Owsiński

Discussion participants: T. Vasko, L. Kairiukštis, G. Bianchi, S. Dresch, J. Owsiński.

First, the question of the scope of agricultural restructuration admitted for in the model and proposed in results was taken up. The model can incorporate both the production profile changes and the shares and cooperation rules of various producer types (state, cooperative and private farms). Of special importance is shaping of cooperation among the variously specializing producer types, which can importantly enhance both production and revenues. Another point of interest was optimum allocation of land among producers, involving different manners of land allocation.

Environmental problems were also looked at, i.e. whether the model in question considers forests and surface water resources, and the pollution effects. The model accounts, as it turned out, for surface water whenever it can be used for agricultural purposes, but leaves out forests. As far as additional pollution is concerned, generated by the power plants, it was taken into consideration through varying assumptions as to crop yields etc. In fact, additional pollution (emissions) proved to be lower than initially expected. As to the whole range of effects only a longer period of observation may allow firmer statements to be made.

The case studied was said to be typical in some of its aspects (large-scale mining development, employment, infrastructure, land reclamation etc.), but also exceptional as to its magnitude. Hence, some experiences from Czechoslovakia, Fed. Rep. of Germany or German Dem. Rep. could be applied, but with very strict reservations.

The final question concerned the role of the analysing group in the multi-party process. Quite naturally, being a technical one, it still has a very important bearing for the participants of this process. There is a variety of views on the subject and

the analysis could not but corroborate, at least partly, some of them.

Paper by T. Kawashima

This paper, as presented after the sessions, was not discussed.

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