ECONOMIC ASPECTS OF SLOVENE
LIVESTOCK PRODUCTION IN CHANGING ENVIRONMENT

S. Kavčič

Summary

This article aims to assess current costs and benefits of Slovene livestock production as well as likely prospects for the near future. Six main Slovene livestock products (milk, beef, pig meat, poultry meat, eggs and lamb) are selected to study their comparative advantages in 1995 and 1997 in terms of a policy analysis matrix. Additional simulation was carried out to estimate likely changes in private profitability under different agricultural policy regimes (Slovenia, current CAP and reformed CAP) both at long and short term prospective. The results suggest that no traditional way of livestock production is internationally competitive, but that milk production has a comparative advantage over other livestock activities. This is important concern which may partially justify current government policy.

Key words: agriculture policy, livestock production, economy analysis, profitability of forming, policy analysis matrix, Slovenia

Introduction

Slovene livestock production is facing with dangerous challenges of globalisation (CAP, CEFTA, WTO). Current economic situation is from the producer point of view far from being satisfactory. What will happen when Slovenia will fully adapt common agricultural policy (CAP)? Is there any possibility for farmers to remain in agriculture and to expect that farm income could be main source of income for their agricultural households?

In this article we will try to answer some of these questions. First we will introduce policy analysis matrix (PAM) as widely used technique for measuring private and social profitability in agriculture and other sectors of

M. Sc. Agr. Econ., B. Sc. Agr. Stane Kavčič, Lecturer, Univ. of Ljubljana, Biotechnical Fac., Zootechnical Dept., Groblje 3, SI-1230 Domžale, Slovenia.

economy. The main purpose of this contribution is to calculate some measures of protection and comparative advantage, from which it is possible to make conclusions about the effectiveness and competitiveness of different agricultural activities. Additional calculations are carried out to simulate likely effects of different agricultural price policies. Some drawbacks of methodology used will also be mentioned. On these ground it is attempted to estimate the general situation and prospects of Slovene livestock production, its additional opportunities and likely development in pre-accession period.

Methodology

PAM approach has been selected as basic technique for this analysis. Reason for that is in its relative simplicity, data availability and straightforward procedure of calculations. Basic PAM methodology has been developed in USA (Monke et al., 1989) and widely used in many developing countries (Goldman et al., 1991; Harrigan et al., 1992; Kydd et al., 1997; Nelson and Panggabean, 1991; Scarborough and Kydd, 1992; Pearson et al., 1995; Yao, 1997a). It has also been used for estimation of likely consequences of full membership of Portugal in EU on its agriculture (Pearson et al., 1987) and more recently for the same purpose in Estonia (Yao, 1997b) and Slovak Republic (Michalek, 1995).

The policy analysis matrix provides a systematic framework for assessing the impacts of government's intervention in certain production systems. According to Monke and Person (1989) the structure of PAM can be described as a product of two accounting identities: one defining profit as the difference between revenues and costs and the other measuring the effects of divergence (distorting policies and market failures) as the difference between observed parameters and parameters that would exist if the divergences were removed. By completing a PAM for a production system one can simultaneously determine the existing economic efficiency of the system, the degree of distortion on the input/output markets, and the extent to which resources are transferred among agents.

Two distinct characteristics of the PAM are the classification or disaggregation of the costs of inputs into their tradable and non-tradable components and the valuation of revenues, costs and benefits using both the market (private) prices and the efficiency (social, shadow or economic) prices. Tradable inputs include those inputs that can be traded in the world market (fertilisers, seeds, pesticides). The non-tradable inputs are mainly domestic factors which are not traded internationally (land, labour, local capital). Most

inputs, however, come in as a mixture of some tradable and non-tradable components and must be disaggregated into their respective tradable and non-tradable components.

A summary of the PAM approach is given in Table 1.

Table 1. - STRUCTURE OF PAM

	Revenues	Tradable input costs	Domestic resource costs	Profits
Private values	A	B	C	D
Social values	E	F	G	H
Divergence	I	J	K	L

Private profit, D = (A-B-C); Social profit, H = E-F-G; Output transfers, I = A-E; Tradable input transfers, J = B-F, Non-tradable input transfers, K = C-G; Net transfer, L = D-H = I-J-K
Source: Monke and Pearson (1989)

The valuation of revenues, costs and profits by their private and social prices allows PAM to determine the extent of divergences caused by policy intervention and/or market failure in both the input and output markets. In this context the private prices are simply the open market prices and the social prices are the shadow prices of all the inputs and outputs of the concerned production system. For tradable goods their shadow prices are the (export or import) parity prices, evaluated with world price (c.i.f. or f.o.b.) at the point of utilisation. The same principle applies to output. For non-tradable factors their shadow prices are the values of output forgone of their best alternative use, i.e. the opportunity costs of the factors.

Private profit measures the private profitability faced by the producer for the production of the crop. Social profit is a measure of social profitability. Because the private and social prices may be (and are) different, social profitability does not coincide with private profitability. A crop which is socially profitable can be unprofitable to the private producer if the private price offered to the producer is to low because of production taxation. Similarly, a crop which is privately profitable to the producer can involve a net loss to the society if the production of that crop is subsidised. In general, if H is positive, it is desirable for the country to produce that crop regardless the sign of D. On the contrary, if H is negative, the country will be better off not to produce that crop – in theory the resources devoted to that crop could be used more profitably for producing other crops.

Output transfer measures the divergence between the private and social revenue. Therefore, it reflects the extent to which the product market is distorted by government policy. Tradable input transfer and non-tradable input

transfer are divergences between the private and social values inputs and so measure the transfer (taxation or subsidy) from the producers to the society for the purchase of such inputs.

Net transfer measures the extent of distortion in profitability. It reflects the net effects of distortions occurring in both the input and output markets. A positive (negative) value implies that a production system is more (less) profitable than what it should be without distortions. This also implies a net inflow (outflow) of resources from the rest of economy into production system in question.

These measures provide important information on the extent of profitability and distortions faced by production systems. But being absolute figures they cannot be used for comparisons among different systems of production or across countries. To overcome this problem, PAM provides a set of relative indicators like well-known nominal protection coefficient on outputs (NPC), the effective protection coefficient (EPC) and the domestic resource cost ratio (DRC).

NPC is defined as a ratio of domestic market price to the border parity price of a commodity. In the PAM framework, this is equal to the ratio of private revenue to social revenue. It is a summary indicator of all government's intervention preventing equality between domestic price and border parity price of a commodity. NPC > 1 indicates implicit subsidy of domestic production.

NPC considers distortion of government policy in product market. EPC as a ratio of value-added measured at private prices to value-added at social prices measures the total effects of intervention in both markets. If EPC >1, it implies that overall impact of the existing policy results in a net positive incentive to produce the commodity.

DRC is the ratio of domestic factor cost required to produce a certain amount of output valued at social prices to the value-added created by the same resources at social prices Therefore, it is a social cost-benefit ratio, which helps determine the desirability of certain domestic production system relative to the international market in terms of economic efficiency. The domestic factor cost is the opportunity cost of domestic resources involved in the production of commodity and the benefit is the value-added generated by the resources measured at social prices If the cost is greater than benefit, production of commodity is not desirable from the social point of view. At DRC < 1 domestic factor cost is less than social benefit generated by resources involved, what implies that it is socially desirable to expand the production of the concerned commodity (Yao, 1997a). Assuming no distortion in the world

market it also implies comparative advantage of the country in producing the commodity.

DRC > 1 implies that the country is not competitive internationally in the production of the commodity, since the opportunity cost of the domestic factors involved in the production of the concerned commodity is greater than the social value-added generated by those factors. As an important indicator of comparative advantage, DRC can be used to rank the competitiveness of different commodities.

PAMs for main Slovene livestock activities have been constructed and NPCs, EPCs and DRCs for major products calculated according to methodology applied by Yao (1997a, 1997b).

A static model like a PAM may generate results which are not realistic in a dynamic sense and potentially biased against government policies. To overcome this limitation some additional calculations are conducted to identify likely changes of private profitability in mid term, i.e. if Slovenia would adapt its agricultural policy to reformed CAP (EC, 1997).

Most data for this study are obtained from the Agricultural Institute of Slovenia (Volk et al., different sources). Model calculations for above average intensive livestock production were taken as main source of information.
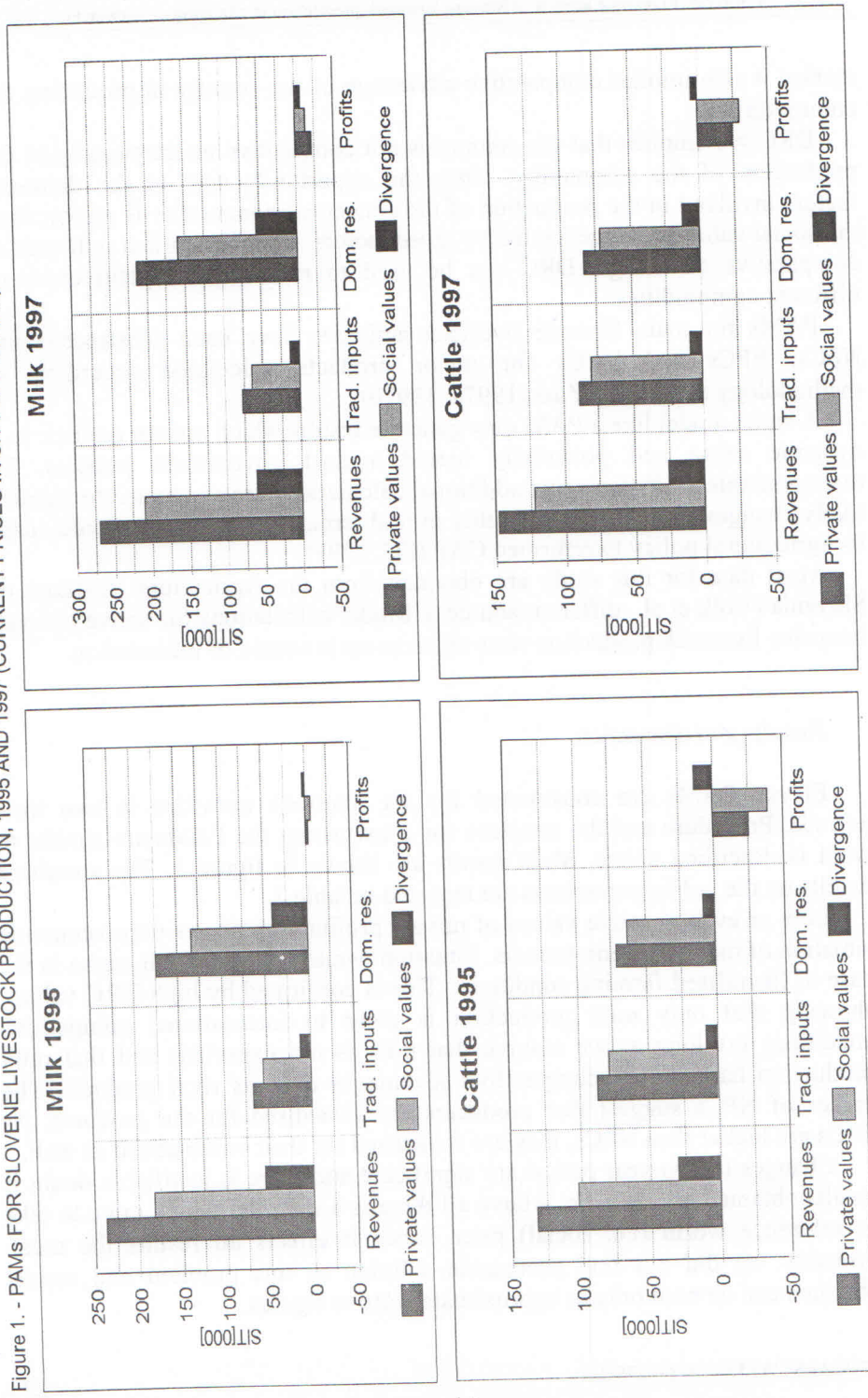
Results and discussion

Eleven PAMs are constructed for six livestock activities in two time periods. Procedure and the structure for constructing the PAMs are similar to what is described above. Main results are shown in figure 1. The summary results on the policy parameters are reported in table 2.
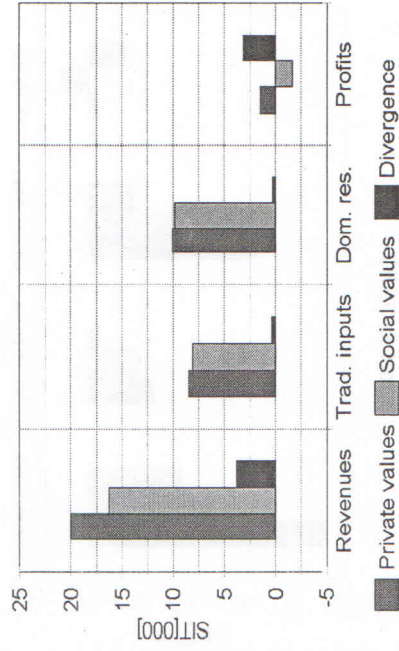
Low or even negative values of private profitability shows poor economic situation of many Slovene farmers. Situation would be even much worse in the case of liberalised farming conditions. This is confirmed by high DRC values, showing that only milk production is close to international competitive conditions (as long as we assume that milk is not exported) and that milk production has obvious comparative advantages over its rival products. The values of NPCs suggest that producers are subsidised for the products. As EPCs are higher than NPCs, they are subsidised for their value-added as well.

Changes in two year period are significant and there is justifiable doubt if results obtained are realistic. Above all there is a question which price to take as reference world (i.e. social) price, since it effects all results the most. Probably we did not find acceptable solution to this problem and results obtained can be used only as approximate relative figures.
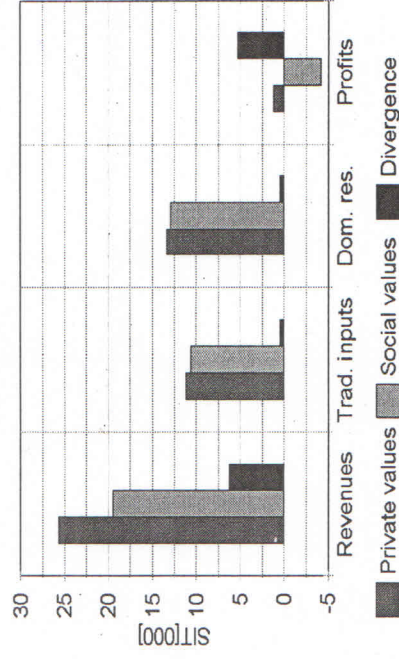
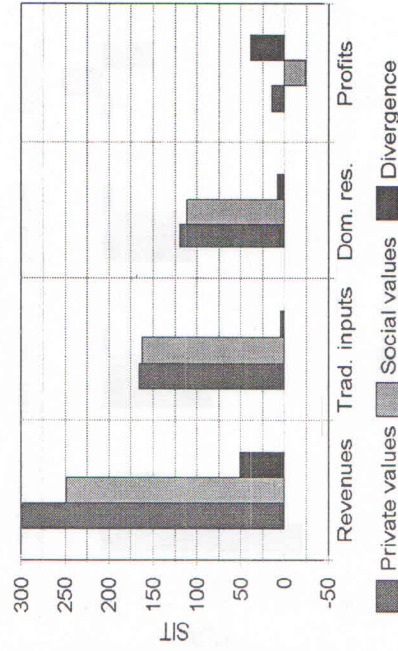Figure 1. - PAMs FOR SLOVENE LIVESTOCK PRODUCTION, 1995 AND 1997 (CURRENT PRICES IN SIT PER ANIMAL)
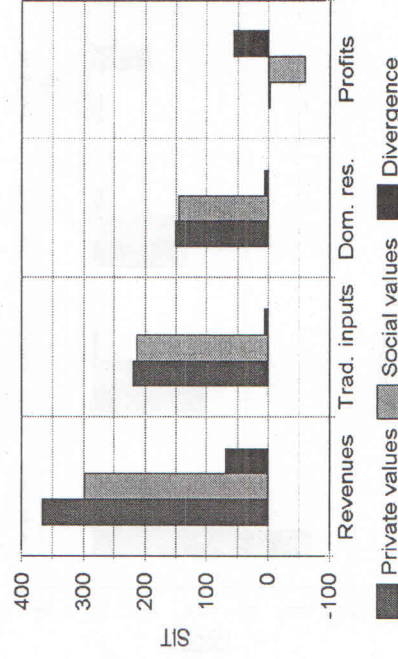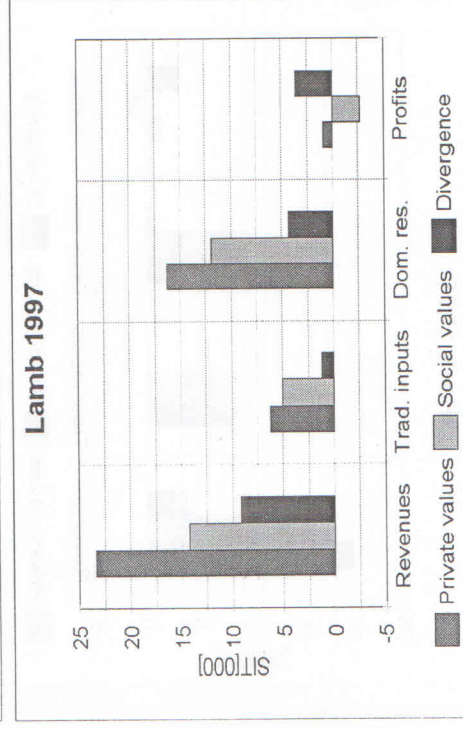
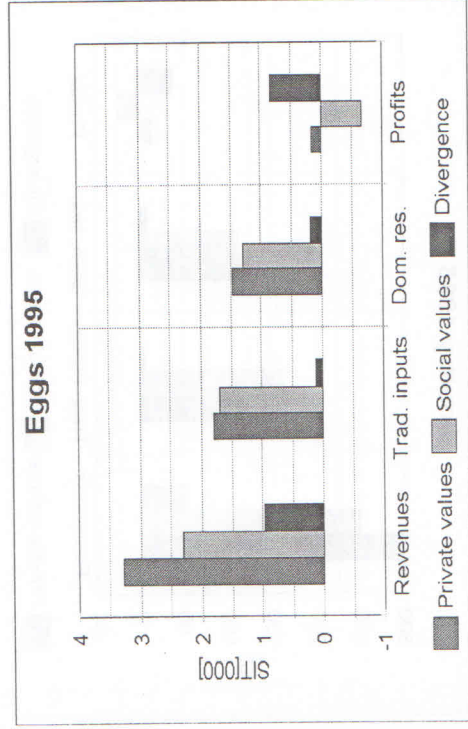Pork 1995 / Pork 1997 / Poultry 1995 / Poultry 1997 — bar charts showing Revenues, Trad. inputs, Dom. res., and Profits for Private values, Social values, and Divergence categories (SIT[000] and SIT axes).

Eggs 1997

Eggs 1995

Lamb 1997

Legend: Private values, Social values, Divergence

Categories: Revenues, Trad. inputs, Dom. res., Profits

SIT[000]
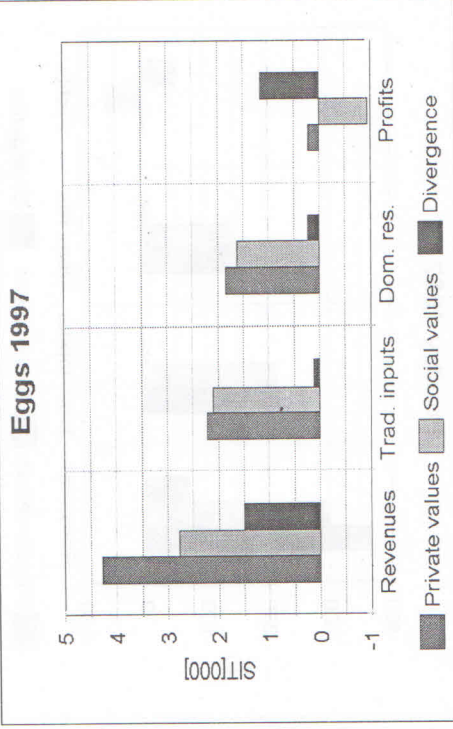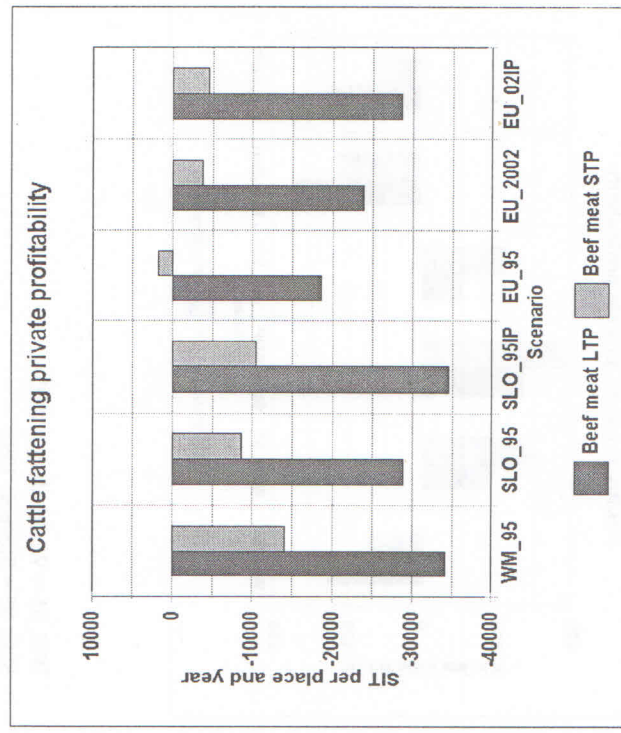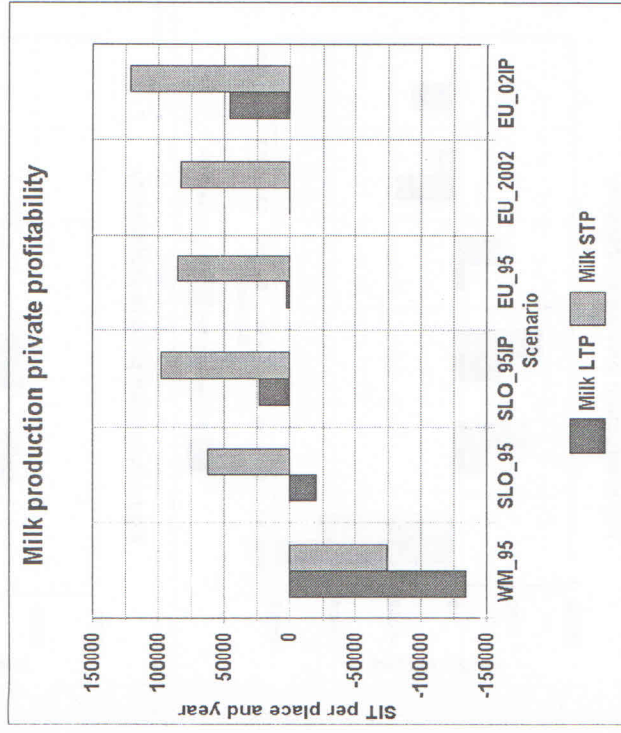
Source: Own calculations, based on AIS data (Volk et al., different sources)
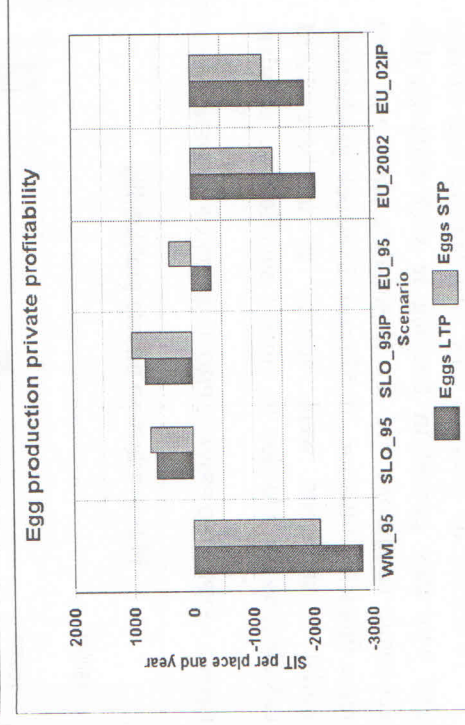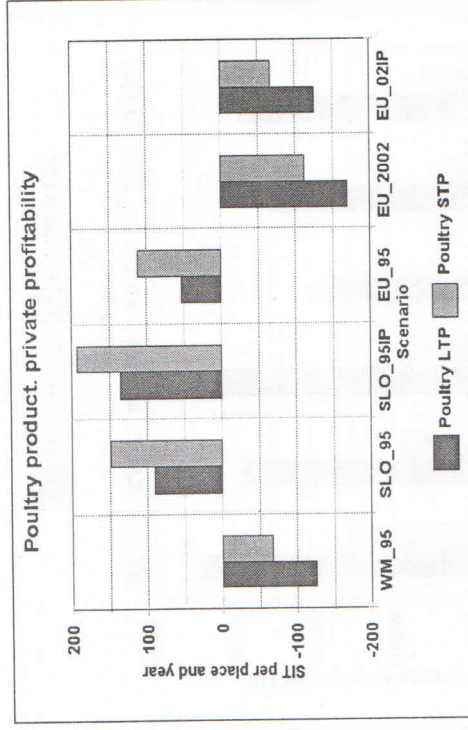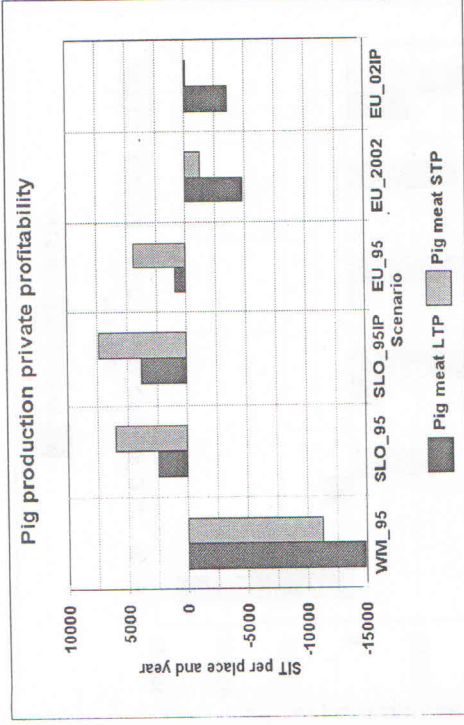
To answer on question how farm families can survive and why they persist in farming in such unfavourable economic conditions, we try to simulate short and long term financial situation of Slovene livestock production. Initial assumptions were similar as in base PAM calculations. In addition to current situation we simulate private profitability at increased productivity (yields increase by 20 to 25%, what is actually achieved by top farmers) and expected situation in the case of fully accepted current and reformed CAP regime, both in long and short term (see notice below figure 2). Results obtained are presented in figure 2.

Figure 2. - EXPECTED PRIVATE PROFITABILITY OF SLOVENE LIVESTOCK SECTOR

Milk production private profitability

Cattle fattening private profitability

Poultry product. private profitability

Pig production private profitability

Egg production private profitability

WM_95 = World Market 1995
SLO_95 = Slovenia 1995
SLO_95IP = Slovenia 1995 Increased productivity
EU_95 = EU CAP regime 1995
EU_2002 = EU CAP - Agenda 2000
EU_02IP = EU CAP - Agenda 2000 Increased Productivity
LTP = long term prospective; STP = short term prospective
(STP equals LTP, but excluding opportunity costs of labour, land and fixed capital)

Source: Jahn and Kavčič, 1997; own calculations

Results obtained by this simulation are in accordance with our expectations. Except beef production all other activities are »profitable« in short term in farming conditions, prevailed in 1995. Even long term situation in 1995 was not as bad as PAMs show, but only in the case that such policy (and other external factors from farmers' point of view) could continue. Obviously this is not the case. At increased productivity situation in 1995 was quite promising (exception was cattle fattening, where our assumptions as well as model calculation probably need some important corrections), but there is no way to persist in farming under world market conditions. In 1995 economic situation for farming would be better under current CAP regime in the case of cattle (milk and meat) production, but worse in pig meat, poultry meat and eggs production. Our calculations show that under reformed CAP situation can improve in cattle production comparing to situation in 1995, but in most cases picture would be worse than under current CAP. In all calculations only effects of agricultural price policies were taking into account.

Conclusion

This study is an application of a PAM for six major Slovene livestock activities to assess the potential cost and benefits of its agricultural policy in livestock sector. The initial set of results suggests that traditional ways of livestock production (and marketing) in Slovenia is not internationally competitive. According to DRC coefficients obtained, milk production has comparative advantage over other livestock activities. Reallocation of resources into dairy sector would therefore mean restricted increase in effectiveness of Slovene agriculture, but only as long as we assume no surpluses of milk production. All Slovene livestock products are uncompetitive under liberalised (world market) conditions for farming.

Current income situation of Slovene farmers is not as bad as one would expect from DRC values. Livestock production in Slovenia is subsidised, protection in cattle and sheep production is lower than in EU and higher in pig production and poultry (Erjavec et al., 1997). In accordance to this expected income situation would change as well: it would rise in cattle production but fall in pig and poultry production. Our simulation shows likely direction of income changes under different policy regimes and not absolute values, as many parameters are difficult to predict with high degree of certainty. Many estimations need further verification to get accurate results.

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EKONOMSKI ASPEKTI SLOVENSKE STOČARSKE PROIZVODNJE U OKOLINI KOJA SE MIJENJA

Sažetak

Cilj ovog članka je ocijeniti tekuće proizvodne troškove i prednosti slovenske stočarske proizvodnje kao i moguće izglede za blizu budućnost. Izabrano je šest glavnih slovenskih stočarskih proizvoda (mlijeko, govedina, svinjetina, perad, jaja i janjetina.) za ispitivanje njihovih razmjernih prednosti 1995. i 1997. godine pomoću matrice analize politike. Provedena je dodatna simulacija za procjenu mogućih promjena u rentabilnosti za seljaka pod različitim režimima poljoprivredne politike (Slovenija, današnji CAP i reformirani CAP) u dugoročnoj i kratkoročnoj perspektivi. Prema rezultatima tradicionalnih načina stočarske proizvodnje nije konkurentan u svijetu. Pa ipak, proizvodnja mlijeka ima relativnu prednost pred drugim stočarskim aktivnostima. Ovo je važno i može djelomično opravdati tekuću vladinu politiku.

Ključne riječi: poljoprivreda, stočarska proizvodnja, gospodarstvo, profitabilnost, politika, analiza, PAM, Slovenija