CZECH ACADEMY OF AGRICULTURAL SCIENCES

AGRICULTURAL ECONOMICS

Zemědělská ekonomika

INSTITUTE OF AGRICULTURAL AND FOOD INFORMATION

9

VOLUME 47
PRAGUE 2001
ISSN 0139-570X

AGRICULTURAL ECONOMICS

An international journal published under the authority of the Ministry of Agriculture and under the direction of the Czech Academy of Agricultural Sciences

ZEMĚDĚLSKÁ EKONOMIKA

Mezinárodní vědecký časopis vydávaný z pověření Ministerstva zemědělství České republiky a pod gescí České akademie zemědělských věd

Aim and scope: The journal published original scientific papers dealing with agricultural subjects from the sphere of economics, management, informatics, ecology, social economy and sociology. Since 1993 the papers continually treat problems which were published in the journal Sociologie venkova a zemědělství until now. An extensive scope of subjects in fact covers the whole of agribusiness, that means economic relations of suppliers and producers of inputs for agriculture and food industry, problems from the aspects of social economy and rural sociology and finally the economics of the population nutrition. Articles are published in English, reviews and information also in English, Czech and Slovak.
Abstracts from the journal are comprised in the databases: Agris, CAB Abstracts, Czech Agricultural Bibliography, WLAS.

Periodicity: The journal is published monthly (12 issues per year). Volume 47 appearing in 2001.

Acceptance of manuscripts: Two copies of manuscript should be addressed to: Mgr. Alena Rottová, Institute of Agricultural and Food Information, Slezská 7, 120 56 Praha 2, Czech Republic, tel.: + 420 2 27 01 03 02, fax: + 420 2 27 01 01 16, e-mail: rott@uzpi.cz. The day the manuscript reaches the editor for the first time is given upon publication as the date of receipt.

Subscription information: Subscription may be ordered only by calendar year (January–December) and should be sent to: Institute of Agricultural and Food Information, Slezská 7, 120 56 Praha 2, Czech Republic. Subscription price for 2001 is 195 USD (Europe), 214 USD (overseas).

Actual information are available at URL address: **http://www.uzpi.cz**

Cíl a odborná náplň: Časopis publikuje autorské vědecké práce s agrární tematikou z oblasti ekonomiky, managementu, informatiky, ekologie, sociálně-ekonomické a sociologické. Od roku 1993 zajišťuje kontinuálně problematiku dosud uveřejňovanou ve zrušeném časopisu Sociologie venkova. Široké tematické spektrum zahrnuje prakticky celou sféru agrobusinessu, tj. ekonomickou problematiku dodavatelských inputových sfér pro zemědělství a potravinářský průmysl, sociálně-ekonomickou problematiku a sociologii venkova a zemědělství, až po ekonomiku výživy obyvatelstva. Statě jsou publikovány v jazyce anglickém, informace v jazyce anglickém, českém nebo slovenském.
Abstrakty z časopisu jsou zahrnuty v těchto databázích: Agris, CAB Abstracts, Czech Agricultural Bibliography, WLAS.

Periodicita: Časopis vychází měsíčně (12× ročně), ročník 47 vychází v roce 2001.

Přijímání rukopisů: Rukopisy ve dvou kopiích je třeba zaslat na adresu redakce: Mgr. Alena Rottová, Ústav zemědělských a potravinářských informací, Slezská 7, 120 56 Praha 2, Česká republika, tel.: + 420 2 27 01 03 02, fax: + 420 2 27 01 01 16, e-mail: rott@uzpi.cz. Den doručení rukopisu do redakce je publikován jako datum přijetí k publikaci.

Informace o předplatném: Objednávky na předplatné jsou přijímány pouze na celý rok (leden–prosinec) a měly by být zaslány na adresu: Ústav zemědělských a potravinářských informací, vydavatelské oddělení, Slezská 7, 120 56 Praha 2. Cena předplatného pro rok 2001 je 1 196 Kč.

Aktuální informace najdete na URL adrese: **http://www.uzpi.cz**

F 4885

An architecture for wholesale service in Internet commerce of fresh fruit and vegetables

Tvorba systému velkoobchodních služeb internetového obchodu s čerstvým ovocem a zeleninou

C.I. COSTOPOULOU[1], H.C. PASSAM

[1]*Informatics Laboratory, Agricultural University of Athens, Athens, Greece*
[2]*Vegetable Production Laboratory, Agricultural University of Athens, Athens, Greece*

Abstract: Electronic commerce boosted by the Internet and World Wide Web acts as a catalyst for trade. Agriculture has a lot to gain from the appropriate use of Internet electronic commerce, since it can offer better ways for trading than traditional markets. The establishment of an efficient electronic wholesale service is a prior condition for the diffusion of Internet electronic commerce into the agricultural market sector. Within this context, the present study proposes a cost-effective and scalable wholesale service in Internet-based fresh fruit and vegetable (FFV) electronic markets. In this study, the functions performed by the existing FFV marketing and distribution channels in moving produce from the producer to the consumer are reviewed, the roles of wholesalers and the problems of the established FFV markets are discussed. A flexible and efficient architecture for an Internet-based FFV wholesale service is proposed, relevant roles and domains are identified, and the principal processing requirements described.

Key words: electronic commerce, electronic markets, market participants, horticultural produce, Internet-based wholesaler

Abstrakt: E-komerce podporovaná Internetem a World Wide Web funguje jako katalyzátor obchodu. Zemědělství může vhodným využitím internetové E-komerce mnoho získat, protože takto lze nabídnout lepší způsoby obchodování, než nabízí tradiční trh. Zavedení efektivního systému velkoobchodních elektronických služeb je prvořadou podmínkou pro rozšíření internetové E-komerce do zemědělského tržního systému. V tomto kontextu nabízí tato práce ekonomicky efektivní a rozsahem přizpůsobitelný systém velkoobchodních služeb pro internetový elektronický obchod čerstvým ovocem a zeleninou. Práce podává přehled činností prováděných již existujícími marketingovými a distribučními kanály pro oblast čerstvého ovoce a zeleniny (FFV) a je zde hodnocena úloha velkoobchodu a problémy stávajících trhů FFV. Je zde navržena flexibilní a efektivní struktura velkoobchodních FFV služeb, jsou identifikovány relevantní úlohy a domény a popsány základní požadavky pro zpracování.

Klíčová slova: elektronický obchod, elektronické trhy, účastníci trhu, produkce ovoce a zeleniny, internetový velkoobchod

INTRODUCTION

The primary objective of digital economy is to create the capability to do business with anyone, anywhere and anytime. One of the newest and most dynamic features of the digital economy is electronic commerce (e-commerce). E-commerce can be defined as the use of information and communication technologies to network economic activities and processes, in order to reduce information-related transaction costs or gain strategic information advantage. It refers to the conduct of business between two or more companies, using an integrated set of electronic tools to streamline business processes and reduce cycle time (Holsapple and Singh 2000). Properly implemented, electronic business presents firms with the opportunity to achieve a strategic advantage, strengthen customer relationships, streamline supply chains, enhance operational efficiency, reduce transactional and overhead costs, and optimise the utilisation of human resources. The exponential growth of the Internet, propelled by the phenomenal popularity of the World Wide Web (Web), is changing many market conventions and creating tremendous opportunities for conducting business via Internet. The Web forms the basis for Internet e-commerce (Internet commerce) systems since it can be used as a networking technology, information management method, information representation scheme and a universal user interface (Kalakota and Whinston 1997). There are three distinctive areas of e-commerce applications: (i) business-to-customer (B2C), where usually customers can learn about and buy products and services, (ii) business-to-business (B2B), for supporting the transactions between organizations, and (iii) intra-organization where the focus is on the integration of internal business processes.

The B2B segment dominates present e-commerce and forecasts for the foreseeable future (Zwass 2000). The agricultural industry has started to recognize the importance of B2B e-commerce in business transactions. Forrester Research predicts that by the year 2004, e-commerce will reach $2.8 trillion and that agriculture will be the third largest e-commerce industry, capturing 8% of this amount. Dozens of Web sites, offering everything from produce trading and feed sales to electronic stockyards, exist on the Internet (e.g. Horsepower.com). In countries with well-developed electronic markets (such as the USA, UK, Nordic countries, Australia and Canada), sellers and buyers of horticultural produce, as well as growers who require equipment and materials for crop production, are able to undertake transactions quickly, efficiently and economically. In North Carolina, for example, area produce growers purchase shipping containers, fertilisers, and other supplies by going online (e.g. via Xsag.com). Moreover, in North America and Northern Europe, there are a number of horticultural enterprises for online buying and selling that operate via the Internet, such as Buyproduce.com, Agribuys.com, Produce-Online.com, AgEx.com, TheAgZone.com, and Direct-Ag.com. Furthermore, countries in the early stages of e-commerce such as Greece have started to show Internet commerce agricultural applications (e.g. fruto.gr, fruits.gr).

Many businesses in the agricultural sector are reengineering this way of carrying out transactions to take advantage of the new conditions. An Internet-based electronic market represents a "virtual place" where buyers and sellers meet to exchange goods and services, using Internet technologies and standards to distribute product data and to facilitate on-line transactions. However, these new electronic markets are different from the traditional markets, thus new strategies and business logic are required.

In traditional agricultural markets, many agricultural commodities are distributed through traditional intermediaries, who act as wholesalers or brokers for the facilitation of market transactions between sellers (e.g. producers, agricultural co-operatives) and buyers (e.g. food companies, middlemen, retailers, supermarkets) by providing intermediation services (e.g. aggregation, matching, search). According to Matsuda et al. (1997), the establishment of efficient intermediary institutions is a prior condition for the diffusion of Internet commerce into agricultural markets. In the e-commerce literature, the intermediation has attracted considerable attention and generated comprehensive analyses (e.g. Chircu and Kauffman 2000; Costopoulou and Passam 2000; Costopoulou and Karetsos 2001). One reason for this is the realization that many of the most financially promising Internet commerce applications are found in the B2B environment, where intermediaries play an important role.

Within this context, the present study proposes a flexible and efficient generic intermediation service in Internet-based agricultural electronic markets. In particular, the study focuses on wholesale service in Internet-based Fresh Fruit and Vegetable (FFV) markets. Since the method of trading of these highly perishable products, often coupled with a short period of availability, can present difficulties due mainly to a lack of rapid communication and close co-operation among market participants, and inadequate distribution programming. As a result delays in distribution and reduction in quality occur. The study describes an Internet-based FFV Wholesaler (FFVW) to regulate demand and supply processes within electronic markets and combine the advantages of both the traditional (or non-electronic) wholesaler and Internet commerce environment.

ESTABLISHED MARKETING OF FRESH FRUIT AND VEGETABLES

Traditional markets

Agricultural markets are regarded as being theoretically very close to purely competitive markets in that: (i) The number of buyers and sellers is sufficiently large so that no individual can purposely influence the market price. (ii) The products are sufficiently homogenous. (iii) There are no artificial restrictions on demand, supply, or prices (Matsuda et al. 1997). However, in the case of FFV, this highly competitive market sector is influenced by the following constraints:

- Seasonal fluctuations in production and availability
- The perishable nature of the produce, which necessitates a rapid market turnover
- The relatively small size of many production units
- The characteristic pattern of consumption (usually frequent purchases of small quantities of produce)
- The demand for a wide range of varieties and grades of individual commodities
- Increasing insistence on high quality, healthy products and a growing demand for pre-packaged and minimally processed commodities.

These constraints lead to a reduction in the "pure competitiveness" of the FFV market in comparison with other agricultural markets, a condition which is offset to some extent by the fact that FFV are less asset-specific than non-agricultural commodities, enabling buyers to locate alternative trading partners more easily.

Traditionally, FFV are distributed in a variety of ways and the degree of centralization is used to distinguish between two basic forms of FFV markets: decentralized and centralized markets. In decentralized FFV markets, buyers and sellers interact directly with each other. These markets include direct sales by producers to consumers (on-farm or street market sales) and producer-retailer marketing. The characteristic liveliness of farmers markets, or the bazaars of the Orient, demonstrates the large number of direct contacts between market participants that are necessary before a transaction can take place. Moreover, the economic attractions of direct selling have led to a significant growth of "farm markets" in traditionally centralized marketing countries, such as the United

Kingdom (Exner 1999). In centralized FFV markets, one or several third parties (primarily wholesalers) act as intermediaries between market participants to facilitate the distribution and pricing of products and the provision of market information. However, the increasing activities of large FFV trading companies, supermarket chains and multinational enterprises have led to a decline in the operation of major wholesale markets, such as that of Covent Garden, London. As a result, a number of wholesalers have diverted their attention to food preparation for retail outlets (Anonymous 1999).

Market participants

In order to have a clear view of the traditional FFV supply chain, it is necessary to distinguish the market participants and their roles. These are as follows:

- *producer* is a farmer that produces FFV and is interested in selling as quickly as possible after harvest, without delay
- *seller* is interested in selling FFV acquired from producers. Agricultural co-operatives, agribusiness, food companies, retailers, and exporters are considered to be sellers
- *wholesaler* acts as an intermediary for the provision of matching services between demand and supply. Exporters, importers, producers, sellers, buyers, middlemen, brokers, distributors, agricultural co-operatives and commission merchants constitute wholesalers
- *buyer* is interested to purchase FFV from producers, sellers or wholesalers, and then to resell them to the consumers. This participant comprises retailers, supermarkets, agribusinesses, food companies, agricultural co-operatives, and importers
- *consumer* purchases FFV from producers or buyers. This participant can be distinguished as individuals or collective consumers (e.g. restaurants, hotels, hospitals).

The roles of sellers, wholesalers and buyers are not mutually exclusive; they are rather fuzzy. For example, an agricultural co-operative can be a seller, wholesaler or buyer at the same time. Participants within the decentralized form of the FFV market include primarily producers and consumers, but also sellers/buyers who may retail produce direct from the producer.

The role of wholesalers

A traditional agricultural wholesaler supports the matching of producers/sellers and buyers, and provides trust to the process, essentially assuring that agricultural transactions are carried out for mutual benefit (Costopoulou and Lambrou 2000). This party is especially useful since agricultural markets have a large number of buyers, sellers and producers, search costs are relatively high, and product turnover is rapid. More specifically, FFV Wholesalers (FFVWs) typically provide services that may include the aggregation of FFV product information, searching for a suitable market participant, negotiating the terms of the deal, providing letters of credit or banking/payment services, and ensuring the delivery of products. These services are analysed as follows:

Communications and transactions. FFVWs reduce the number of communications and transactions needed in the supply and delivery of FFV (Jain Palvia and Vemuri 1999). For example, transaction between m sellers and n buyers without the aid of wholesalers, requires $m \times n$ exchanges, while a single wholesaler will reduce the number of exchanges to $m + n$. Without a wholesaler, twelve exchanges are required between four sellers and three buyers. With the incorporation of a wholesaler into the supply chain, the number of exchanges is reduced to seven.

Product information aggregation. FFVWs collect and offer the appropriate information (e.g. the type, quantity) as required to market participants, providing convenience in searching for sources. They also circumvent the need of buyers to visit many producers or sellers, maybe in different places or even in different countries.

Product matching. FFVWs support the matching between sellers' offers and buyers' preferences. Sometimes, they provide a bundle of services that balance the needs of buyers and sellers and are acceptable to both. In other words, an important service provided by a wholesaler is the integration of buyers' and sellers' needs. FFVWs also support ordering procedures and close co-operation between the market participants concerning such matters as method of payment.

Risk management. FFV buyers do not always have perfect information about product quality and hence they should trust FFVWs. The FFV buyer faces a certain amount of risk, which may be the result of uncertainty about communication failure regarding the characteristics of the FFV produce, or the intentional or accidental failure of the producer to provide an adequate produce. On the other hand, the FFV producer or seller faces the risk of quality loss as a result of poor handling and marketing technology or as a result of slow market turnover. A significant service that FFVWs provide is related to the minimization of these risks.

Financing. FFVWs facilitate the solving of logistical complexities and confidential matters, and relieve the buyers and sellers.

Product promotion. FFVWs frequently play a significant role in the promotion strategy of FFV in the market.

Exportation/importation activities. FFVWs support export or import procedures, when commercial transactions involve products destined for export or import.

Post-transactions. FFVWs mediate in the resolution of complaints by a buyer, seller or additional customer services.

Problems of the established markets

Current commercial practices for the trading of FFV rely mainly on personal contacts and peer-to-peer communication among the market participants by telephone, telex

and fax, as far as information transactions are concerned, together with associated transportation and distribution activities. A number of problems and malfunctions arise, the principal ones of which are:

- Difficult and time-consuming procedure of searching for market participants, often with doubtful results
- Impossibility of direct, synchronous transfer of products to foreign markets
- Delays in product delivery, which may reduce freshness on arrival at the market
- Lack of precise knowledge of buyers about all the characteristics of available products (e.g. quality)
- Lack of co-ordination during product export
- Irregular supply of large chains of shops
- Insufficient awareness of buyers about the range of local producers and sellers
- High cost of transportation, due to the fact that transportation needs are not made public and therefore haulage companies often cannot effectively complete or optimize their loads and itinerary
- Lack of product advertisement
- Production of a type and variety of product which is different from that required by the market
- Insufficient transfer of information among producers concerning new varieties of produce, new markets, market requirements, demand and movement within local and export markets.

The increased mobility of the world's population has significantly increased the demand for a greater variety of products including exotic imports. Hence, retailers have to keep a rich assortment of commodities on their shelves at all times. Moreover, increasing demand for healthy products has led to the development of small, diverse, customized niche markets.

AN INTERNET BASED FFV WHOLESALE SERVICE

In recent years, a lot of effort and attention has been put into the specification, the development and deployment of intermediation in the context of e-commerce. A number of research projects have been developed or are developing relevant to electronic intermediation. Some key projects addressing this topic are: Architecture for Information Brokerage Service (ABS), Object Framework for Electronic Requisitioning (OFFER), Generic Architecture for Information Availability (GAIA), Agent based Brokerage Services in Electronic Commerce (ABROSE), Common Brokerage Architecture (COBRA), and Open Service Model for Information Brokerage and Distribution (OSM) (ACTS 1998).

An Architecture

In our view, the efficient development of an Internet-based FFV market should primarily be based on a generic FFV wholesale service architecture. The proposed architecture is created by populating the generic ABS information brokerage framework (ACTS 1998; Costopoulou and Lambrou 2000) with the necessary agricultural business logic to support the Internet-based FFVW. In the Internet-based FFV wholesale architecture, the business participants and their roles are (Figure 1):

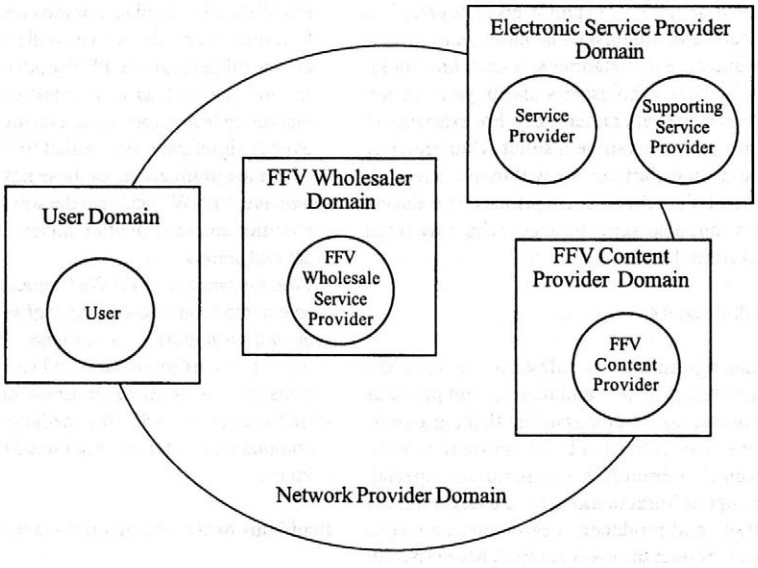

Figure 1. A FFV wholesale service architecture

The *user of FFV wholesale service* is an entity (producer, seller, buyer or consumer) using the FFV wholesale service to satisfy his/her own requirements (i.e. buy or sell FFV).

The *FFV wholesale service provider* is an entity that offers FFV and services information to users from other participants. This information is registered to the system knowledge base.

The *FFV content provider* is an entity that offers negotiable or tradable services and FFV to users by means of the FFV wholesale service.

The *electronic service provider* is an entity that provides telecommunication, information or application services. This player caters for multimedia application services such as tele-learning, and support services including security and payment.

The *network provider* is an entity that provides all necessary networking functions to the other participants. A network provider is an organization owning and running a network and offering basic services implemented on the network.

The above participants interact within the following domains: user domain, FFVW domain, electronic service provider domain, FFV content provider domain, and network provider domain. The term "domain" is used intuitively to depict a collection of software objects assembled for the purpose of specific common objectives, such as ownership, administrative responsibility, technology etc.

The requirements of the individual participants with respect to the FFV wholesale service are as follows (Lambrou et al. 1998):

- *Presentation* requirements concerning the presentation of FFV demand (related to the user), the results (related to the user) and the offers (related to the FFV content or electronic service provider).
- *Access* requirements concerning access to information (speed, reliability, efficiency).
- *Quality* requirements concerning the availability, reliability and quality of offered information.
- *Security* requirements concerning all security aspects (authentication, confidentiality, integrity etc.).

Analytically, the requirements of the user participant are: *Presentation*: easy and user-friendly presentation that is attractive to the eye (e.g. query results). *Access*: instant access, transparency of content location. *Quality*: cost/quality negotiation (the user should be able to choose the quality and cost of the information he wants to receive from the Internet-based FFVW), offer comparison (the Internet-based FFVW should be able to compare the offers of different producers or sellers), combination of offers (the Internet-based FFVW should be able to combine different offers within a single offer), reliability of the information (the user needs an assurance of the reliability of the information), access to relevant information (the Internet-based FFVW must assure the user that the information accessed is relevant), reliable service (rapid delivery of the products). *Security*: authentication of the user (can be handled through encryption methods such as a digital signature, but implies the involvement of a trusted third party), confidentiality of the user information, confidentiality of service content and negotiations (only the two negotiating entities should have access to the communication during negotiations), integrity (all transactions must be checked for integrity).

The requirements of the FFV content or electronic service provider are: *Presentation:* offers properly classified (the Internet-based FFVW must assure the content provider such as producer or seller that its offers will be classified in the right sections), offers properly presented to the demand side (the Internet-based FFVW should assure the content provider that his offers will be proposed), offers proposed to potential demander (the Internet-based FFVW should be able to propose an offer, even if it does not exactly suit the demand). *Access:* ease of updating the offer (the content or electronic service provider must be able to add content easily or to update information on content or a service), adaptation to private information model (the content or electronic service provider must be assured that his own information format is supported by the Internet-based FFVW). *Quality:* information on the demand and the users (the content provider expects the Internet-based FFVW to provide him with information about clients), quality guarantee (the Internet-based FFVW must assure the content or electronic service provider that the content or service quality must be of satisfactory quality). *Security:* confidentiality of information, content integrity.

The FFV wholesale service provider has certain obligations concerning the services he offers. These include: *Presentation*: easy and user friendly as well as attractive presentation of the FFV wholesale information. *Access*: ease of access to the proposed contents or services registered to the system by all other interested parties (producers, sellers, buyers or consumers), full transparency. *Quality*: information on the demand and the users. *Security*: integrity, protection from abuse, confidentiality, and authentication requirements.

Beyond the requirements listed above, the following processes are also considered to be essential for the FFV wholesale service (Figure 2):

Meta-catalogue representation. The meta-catalogue is responsible for maintaining meta-information for the information sources in the FFV content provider domain. It forms the knowledge base of the Internet-based FFVW and is absolutely necessary since it facilitates the mapping between demand and supply, and provides the appropriate classification mechanism. Each entry in the meta-catalogue is called a resource. A resource is a composed entity, encapsulating informational items from the FFV content providers domain, kept and maintained by the Internet-based wholesaler.

User request processing. The proposed system has to handle user requests where the main steps are: (1) to adapt the user request to the appropriate format in order to access the meta-catalogue resources, (2) to iden-

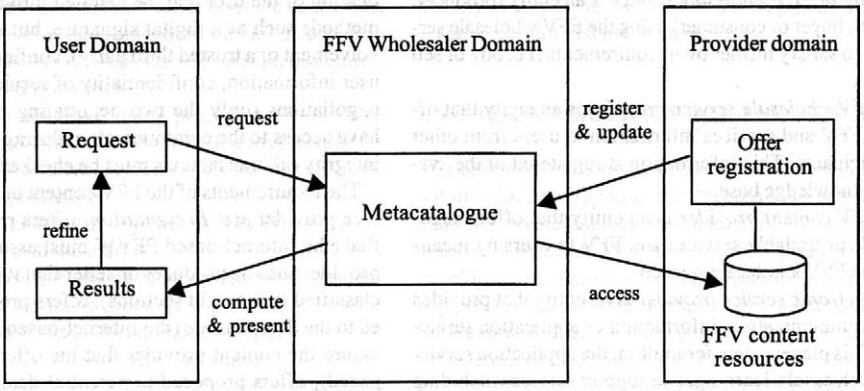

Figure 2. Main information processing

tify the appropriate resources and/or content provider resources related to the request (3) to access the content providers resources if needed, and (4) to retrieve the actual offers, prepare, compute, and present the results in an appropriate manner to the user side.

Offer registration/processing. When a content provider is connected to the system, he provides a formal description of his contents through an operation called offer registration. The system has to (1) enable content providers to register or update their offers efficiently, and (2) associate the offer with the meta-catalogue resources. Content providers resources may include structured data for producers or sellers registered with the system, providing information about the contact person, place of origin, the product type and variety, the form of product packaging, the estimated produce quantity, quality, period of availability and price. They may also include free text description, field features, field images, product pictures, producer or seller profiles etc. Similarly, for buyers or consumers, they may provide information about the contact person, place of delivery, the product type and variety demanded, the estimated quantity required, quality, demand period and the price of the demanded products. They may also include buyer profiles etc.

A case study

In this section, an analysis of the proposed system in a real life scenario is performed. The scenario concerns the producers of vegetable produce of a rural region of Greece, Karditsa. An exploratory study, referring to the role of traditional wholesalers in the supply chain of vegetable produce, was conducted through a questionnaire. The questionnaire was drawn up including questions like:

- Indicate the type and quantity of products you produce and how they are distributed.
- Do you have confidence in the wholesaler with respect to distribution and economic transactions? – Indicate any problems you have with wholesalers.
- Do you wish to have a better wholesale service, for example through the Internet?
- Indicate which new services of electronic wholesaling you would be interested in.

The survey, which was carried out in March 2000, showed the following results. Although all the producers who answered the questionnaire distribute their produce though wholesalers, 63% did not express confidence in the wholesalers with respect to the satisfactory distribution of their produce at the best possible price, 25% did not reply, and only 12% were satisfied. Half of the producers expressed confidence in wholesalers with respect to economical transactions, 37% did not reply, and only 13% expressed no confidence. All of those who replied to the questionnaire indicated that they desire a better wholesale service and would be interested in an e-commerce application which would provide them with traditional wholesale services as well as improved facilities. Moreover, all of the producers concerned expressed interest in the following new services of an electronic wholesaler: opening of new markets; rapid distribution of produce; advertising of products; rapid and continuous communication with the wholesalers; security procedures during transactions with wholesalers; and information about new products, market conditions, demand and movement within domestic and foreign markets.

To clarify the proposed system, the above scenario is applied, in which (a) the Karditsa producers want to sell their vegetable produce, (b) the local agricultural co-operative of Karditsa intends to provide Internet-based vegetable wholesale services, and (c) the buyers from domestic or foreign markets wish to buy vegetable produce via this system. The business participants of the system are:

User of the vegetable wholesale service: Agribusiness, wholesale companies, exporters, food companies, re-

tailers, supermarkets, hotels, restaurants, hospitals, Kartista producers etc. can be users.

Wholesale service provider: The local agricultural co-operative of Karditsa will offer Internet-based electronic wholesale services, maybe in co-operation with a local information technology company.

Content provider: Content providers will be any vegetable producer (e.g. members of the agricultural co-operative) of Karditsa, and the buyers who will be the purchasers. The content will be in the Greek or English language.

Service provider: The service provider will be a local information technology company.

Network provider: The network provider will be the Hellenic Telecommunications Company (OTE), with an Information Service Provider such as OTEnet, Forthnet etc. Access to the service will be obtained through the public Internet.

Potential benefits

Internet-based FFVWs can provide virtually the same services as traditional wholesalers. In addition, they can add value to current commercial services, as well as offer new services and benefits (e.g. global presence). However, both buyers and sellers must have at least as much confidence in Internet-based FFVWs as they have in traditional wholesalers. The potential benefits of Internet-based FFVWs in the supply chain are estimated to be as follows:

Major saving of time and search costs in comparison with traditional wholesalers who have to communicate by telephone, telex or fax with a large number of market participants or to access several sources. The Internet-based FFVW aggregates numerous sources offered by several producers or sellers and presents them to buyers and consumers in a consistent format.

Complete selection and qualified information reasoning. Internet-based FFVW have the ability to query and monitor a set of numerous sources in order to meet FFV buyers' specific requirements. They have the possibility of collecting advanced information and of storing, sorting and analyzing functions on both the buyers' and sellers' sides. In consequence, they can acquire, combine and present more information than traditional wholesalers.

Global dimension. The boundaries of an Internet-based wholesaler are not defined by national borders, but by the coverage of computer networks, and the transport and distribution infrastructure. This enables even the smallest FFV producer or seller to achieve a global presence. Moreover, the FFV buyer or consumer can select products from theoretically all potential producers or sellers registered with the proposed system, regardless of their geographical location.

Rapid response to needs. Internet-based FFVWs can efficiently, and often immediately, close electronic transactions, as well as the physical delivery of products. They have the ability to respond rapidly to the buyers' demands and provide the relevant product, without being limited to its availability in local or national markets. They can also provide a regular supply for large chains of customers.

Substantial cost savings. One of the major contributions of Internet-based wholesalers is a reduction in transaction costs. Since the costs of a business transaction that entails human interactions are several orders of magnitude greater than the cost of conducting a similar transaction electronically, substantial cost savings can in turn be translated into significant price reductions.

Trust services. An Internet-based FFVW can ensure a high quality of the service by editing the register so as to remove any participant who does not meet the requirements standard.

CONCLUSION

In conclusion, Internet commerce can offer an interesting solution for the increase in efficiency and quality of the present FFV market system. In this study, a generic architecture for wholesale service in Internet-based FFV markets is identified. The proposed FFV wholesale service can bring greater efficiency, increased response and cost reductions to FFV market participants. It can support the demand and supply processes both of decentralized and centralized established FFV markets. The implementation of such a service will significantly contribute to the modernization of the methods of FFV marketing and distribution and will assist in the rejuvenation of wholesale activities (Anonymous 1999). Moreover, within the context of the entry of global information systems into the field of agriculture, crop management and yield prediction (Heiniger 1999), a parallel synchronization of the marketing process incorporating a new generation of FFVWs, the Internet-based FFVW is of vital importance.

REFERENCES

ACTS-Advanced Communications Technologies & Services (1998). Information Brokerage. European Commission ACTS projects. Deutsche Telekom Berkom.

Anonymous (1999): Back in the Garden. Grower *132*, (20): 14–16.

Chircu A.M., Kauffman R.J. (2000): Reintermediation strategies in business-to-business electronic commerce. International Journal of Electronic Commerce *4* (4): 7–42.

Costopoulou C.I., Passam H.C. (2000): Opportunities of electronic commerce for rural development: The role of intermediaries in agriculture. In: Agricultural Engineering into the Third Millennium, pp. 282–284. Bedford: Silsoe Research Institute.

Costopoulou C.I., Lambrou M.A. (2000): An architecture of virtual agricultural market systems: The case of trading perishable agricultural products. Information Services & Use, *20*: 39–48.

Costopoulou C.I., Karetsos S.T. (2001): The broker role in agricultural electronic commerce. In: 3rd conference of the European Federation for Information Technology in Agriculture, Food and Environment - EFITA (to be published).

Exner R. (1999): Hands-on selling. Grower, *132*, (4): 14–15.

Heiniger R.W. (1999): Understanding geographic information systems and global positioning systems in horticultural applications. HortTechnology, *9*: 539–547.

Holsapple W.C., Singh M. (2000): Electronic commerce: From a definition taxonomy towards a knowledge-management view. Journal of Organizational Computing and Electronic Commerce, *10*, (3): 149–170.

Jain Palvia S.C., Vemuri V.K. (1999): Distribution channels in electronic markets: A functional analysis of the disintermediation hypothesis. Electronic Markets, *9*: 118–125.

Kalakota R., Whinston A.B. (1997): Electronic commerce: A manager's guide. Addison-Wesley Publishing Company, 431 p.

Lambrou M.A., Karetsos G., Protonotarios E.N. (1998): A service analysis and service design framework for the implementation of a generic information brokerage service. In: Roger J.Y. et al. (eds): Advances in information technology: the business challenge, pp. 226–233. IOS Press, Netherlands.

Matsuda T., Clark T.H., Lee H.G. (1997): Electronic commerce for agricultural transactions: role of intermediaries and accurate pricing. In: Nunamaker J.F., Sprague R.H. (eds): Proceedings of the Thirtieth Annual Hawaii International Conference on System Sciences. Los Alamitos, p. 13–20. CA, IEEE Computer Society Press (http://emi.h.chiba-u.ac.jp/japache/RCECAFrame.html).

Zwass V. (2000). Editor's introduction: electronic intermediaries. International Journal of Electronic Commerce, *4*, (4): 3–4.

Arrived on 9th June 2001

Contact address:

Constantina I. Costopoulou, Harold C. Passam, Agricultural University of Athens, 75 Iera Odos, 118 55 Athens, Greece

Development trends of the agricultural market with the main agricultural commodities in the Slovak Republic

Tendencie vývoja agrárneho trhu s hlavnými poľnohospodárskymi komoditami v Slovenskej republike

V. IŽÁKOVÁ

Research Institute of Agricultural and Food Economics, Bratislava, Slovak Republic

Abstract: The development of the domestic agricultural market in the years 1999-2000 corroborated the past development trends. In animal production, in the majority of commodities except slaughter sheep and sheep cheese, domestic consumption and export figures declined and export increased. These trends reflect an unconsolidated situation in animal production and a low competitiveness of the Slovak agricultural animal products in the domestic and foreign markets. The price development in animal products except poultry has also been impacted by the State market intervention. Grain production was exposed to a strong pressure of adverse weather. Oilseeds continued to improve their competitiveness in both the domestic and foreign markets. Grain production allowed for only a limited supply, despite that, it was sufficient to meet the 1999 domestic consumption needs; however, in 2000, grain import proved inevitable. Price development was markedly influenced by the foreign price levels. Further production development is contingent on the improved competitiveness of domestic products in the local and foreign markets. This objective may be met based on a targeted export support of the individual commodities up to the WTO limit, as the domestic market is not capable of absorbing the increased agricultural production. The above market development trends indicate that the economic success of the country's agri-sector is not only dependent on the domestic market and macroeconomic development. Directly or indirectly, an ever-greater role is played by the development of the global agricultural market and agricultural policies of other countries. Consequently, it is difficult to implement a one-sided isolated agricultural reform within a particular country.

Key words: agricultural market, agricultural commodities, supply, demand, prices, consumption

Abstrakt: Vývoj domáceho agrárneho trhu v rokoch 1999–2000 potvrdil tendenciu z minulých období. V živočíšnej výrobe u väčšiny komodít s výnimkou jatočných oviec a ovčieho syra dochádzalo k znižovaniu domácej spotreby i vývozu a k rastu dovozu. To spôsobilo pokles alebo stagnáciu výroby a teda aj ponuky. Svedčí to o nekonsolidovaných výrobných pomeroch v živočíšnej výrobe a nízkej konkurenčnej schopnosti slovenských agrárnych živočíšnych produktov na domácom a zahraničnom trhu. Vývoj cien živočíšnych produktov s výnimkou hydinových, bol ovplyvnený aj štátnymi zásahmi na trhu. Produkcia rastlinnej výroby bola silne pod vplyvom nepriaznivých poveternostných vplyvov. Naďalej si posilnili konkurencieschopnosť na domácom trhu, ale aj v zahraničí olejnaté semená. Produkcia obilnín umožnila len nižšiu ponuku, tá však bola v roku 1999 pre potreby domácej spotreby dostatočná a v roku 2000 bolo potrebné dovieť časť obilia. Vývoj cien bol silne ovplyvnený najmä úrovňou cien v zahraničí. Ďalší rozvoj výroby je možný len pod vplyvom zvýšenia konkurencieschopnosti našich produktov na domácom a zahraničnom trhu. K tomu by mala slúžiť najmä cielená exportná podpora jednotlivých komodít až do výšky limitu WTO, pretože domáci trh nie je schopný absorbovať zvýšenú poľnohospodársku produkciu. Z uvedeného vývoja trhu vyplýva, že hospodársky úspech agrárneho sektoru v krajine nie je už závislý len od vývoja na domácom trhu a od vývoja makroekonomiky. Stále väčšiu rolu priamo alebo nepriamo hrá vývoj svetového agrárneho trhu a agrárnej politiky v ostatných krajinách. Z toho vyplýva, že jednostranné izolované agrárne reformy v rámci jednotlivej krajiny sa dajú ťažko presadiť.

Kľúčové slová: agrárny trh, poľnohospodárske komodity, ponuka, dopyt, ceny, spotreba

INTRODUCTION

During the transformation, the development of the Slovak agricultural market has been impacted by significant swings and sweeping changes. In the first period between 1990–1995, as a consequence of price deregulation, food demand declined along with the agricultural commodity demand. Animal production suffered the greatest losses. Due to this adverse development, cuts in the marketing of agricultural products were recorded. In the period that followed, supply continued to deteriorate, however, it was influenced by food import rather than domestic demand, whereby import accounted for 30 per cent of the total food stuff consumption. Due to that, the monitoring of the domestic agricultural market by individual commodities is crucial. For monitoring purpos-

es, the status and projection reports are used that contain the processed outputs of the research project entitled the Framing of the Agri-food Market of the SR within the Context of the World Economy Globalisation. These reports are intended to serve as a guide in the agricultural market development not only to market players but also the sectoral Ministry of Agriculture of the Slovak Republic (MA SR), the State Fund for Market Regulation (SFMR), and other users. The paper utilises the data base of these outputs and presents an evaluation of the agricultural market development between the years 1999 and 2000, to give a picture of the status of the Slovak market with agricultural commodities.

METHODOLOGY

The paper is based on the 1999 and 2000 status and projection reports on individual agricultural commodities which are largely based on the agricultural statistical returns of the Statistics Office of the SR and customs statistics published by the Customs Directorate of the SR. Furthermore, weekly overviews featured in the Agricultural Market Information System (ATIS) and 1999 and 2000 annual market evaluations were used. The common statistical methods, notably, comparisons, indices and trend evaluation, were employed in data processing.

RESULTS AND DISCUSSION

The development of the agricultural market in Slovakia in 1999 and 2000 was most markedly influenced by a poor crop, the import of cheaper, often subsidised agri-food commodities, especially from the EU and the Czech Republic, and the predominating progressing decline of the purchase prices of agricultural products in 1999, or their year-to-year increase by 7.2 per cent in 2000. This was reflected in 11 per cent drop in the 1999 marketing of agricultural products and, in the year 2000, 7.2 per cent decline in contrast with the year before. While in 1999 this decline was caused by a cumulated effect of price and production decline, in 2000 it was due to the production drop-out which could not be offset by the price increase.

Domestic demand was stabilised which was also reflected in the growth of the domestic food production by 7.15 per cent and the increase in the value added of this industrial branch by 16 per cent.

Swings in the crop production supply were exclusively due to climatic conditions and not to the producer behaviour or increased import supply. Exception were potatoes, in which producers responded to a declining demand on the part of domestic consumers. In the commodities of plant origin, significant year-to-year swings were recorded, largely due to the adverse weather. In 1999, grain production reported 19 per cent year-to-year decline, potatoes 11.5 per cent, legumes 20.1 per cent, and fruits 23.2 per cent decline. The oilseed production went up by 60.3 per cent, vegetables by 15.5 per cent, and sugar by 27.9 per cent. Overall, the year 2000 reported a poor crop due to drought, the exception being potatoes; hence, grain production reported 22 per cent year-to-year decline, oilseeds dropped by 31.2 per cent, and sugar by 34.3 per cent.

High demand was also reported in animal products, however, the producer behaviour was affected by the import of cheaper raw materials, especially from the Czech Republic (CR) which continued to drive the domestic producers out. Since 1999, this trend has been especially evident in poultry meat. Production volumes in beef meet dropped by 13 per cent, in pork, by 2.8 per cent, and milk, by 6 per cent.

The balance in the markets of individual commodities and, to a considerable extent, of supply, were conditioned by subsidies regarding in agricultural production, and, to a lesser extent, by export subsidies. This is especially obvious in milk, sheep rearing and potato growing. In conjunction with keeping the balance in the market of individual commodities, the SFMR activity proved vital. Export subsidies, especially in dairy products, had a clearly positive effect upon the marketing figures. The impact of guaranteed prices applied to a wide range of products in 2000 connected with production quotas cannot be evaluated as yet, however, some implications and data indicate a lower efficiency than anticipated. Meat and milk supply did not report any increase, however, average purchase prices increased by 3.7 per cent in meat and 7.7 per cent in milk.

The development of supply, demand, and prices in individual agricultural commodities varied, hence, it will be characterised separately by core products.

Despite the 1999 production drop-out totalling 600,000 tonnes, food and fodder grain supply was satisfactory in 1999, and the grain market was mostly supplied with subsidized cheaper grain from Hungary, especially in the early months of 1999. This was the main reason why, despite a limited supply of domestic products, the 1999 average purchase prices of food grain were lower by 2–2.4 per cent in contrast with the year before. The most dramatic slump was recorded in average purchase prices of fodder grain, in industrial maize by 5.6 per cent, fodder wheat by 7 per cent, and fodder barley by 9 per cent. In 2000, supply declined due to a poor crop in wheat, maize, and barley. In parallel, grain prices increased, however, as a consequence of imposing maximum import prices of fodder grain which was imported by the SFMR with a state subsidy of SKK 1 500 per tonne starting from November 2000 (Figure 1).

The sufficient supply of domestically produced grain in 1999, the import of cheaper grain from Hungary and lower prices in foreign markets, the liberalisation of import licences in the autumn months allowed to increase the export of grain in 1999, especially wheat and barley, and the total foreign trade balance in grain improved, especially in wheat and barley. In 2000, due to a poor crop in wheat, maize, and barley, a ban was imposed on grain

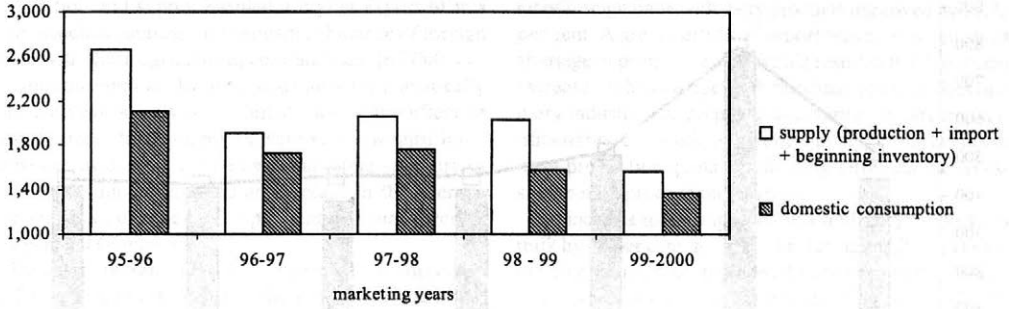

Figure 1. Wheat supply and domestic consumption, thousand t

import. On the contrary, fodder grain was exported with a state price intervention and the foreign trade balance reported a negative figure totalling SKK 591 million.

The 1999 production and supply of sugar beet grown on a smaller area of land than in the years before reported figures which were higher than the year before, by 74 000 tonnes. This increase was due to higher per hectare yields, by 2.56 t. Also, sugar content was much higher (by 1.43 points), and sugar production, compared with 1998, increased by 28 per cent. In 2000, due to the adverse weather conditions, the sugar beet supply was unsatisfactory, or 31.6 per cent lower than in the year before which was more favourable with regard to weather (Figure 2).

Given the sugar surplus from the year before, the import of cheaper sugar from the neighbouring countries, notably CR, Poland, and Hungary, and competition on the part of iso-glucose which substitutes sugar consumption in industrial use, a slump was recorded in the marketing of sugar beet. The 1999 and 2000 average purchase prices maintained a high level of SKK 900, or SKK 992 per tonne, which is 50, or 142 crowns more per tonne largely

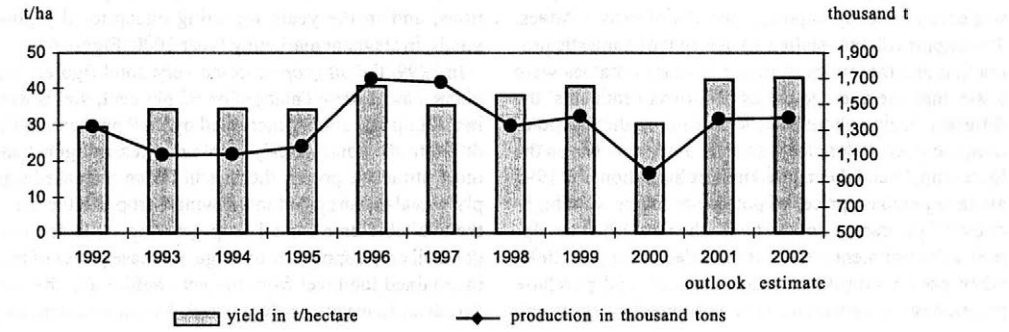

Figure 2. Hectare yield and production of technical sugar beet

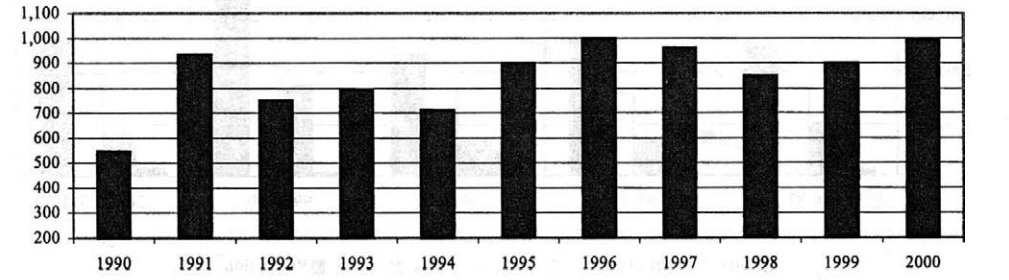

Figure 3. Price development in sugar beet, SKK/t

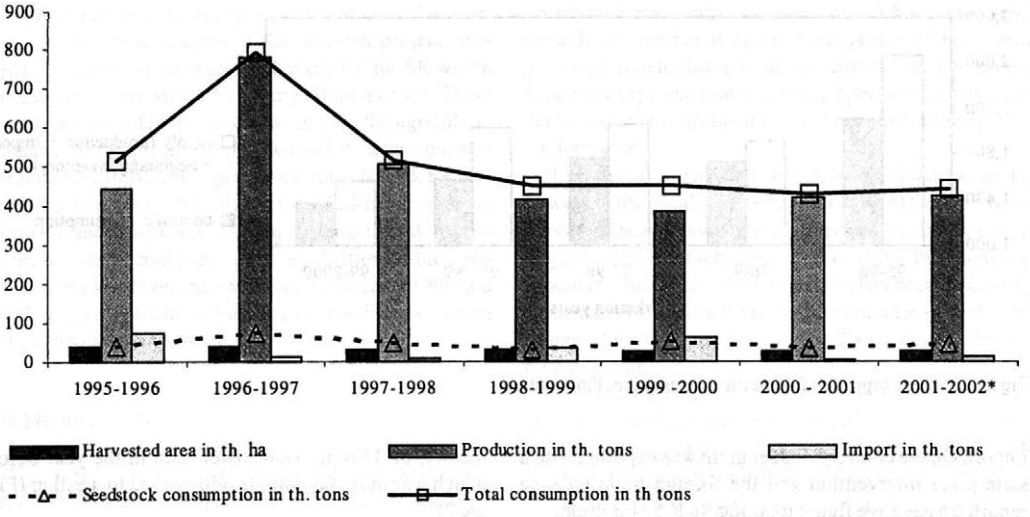

Figure 4. Development of supply and utilization of potatoes in the SR

thanks to a much higher average sugar content of the purchased sugar beet (by two percentage points, Figure 3).

The harvested area of *potatoes* reported a decline in both the years which, considering the stagnant and continuously low per hectare yields, compared with the EU, resulted in the overall decline of the supply in the Slovak market by 6.7 per cent in 1999, or, 385 000 t. This drop-out was partly offset by import, especially of early potatoes. The import volume totalled 8.9 per cent of domestic production and the prices of imported early potatoes were lower than the average prices of Slovak producers, the difference being about SKK 4 per kilo; in the late potatoes, the price difference was SKK 3 per kilo. Given the lower supply and the marked import limitation, the 1999 average purchase prices of potato producers were higher by 9.7 per cent in contrast with the year 1998. An opposite development trend was recorded in the year 2000, when potato supply exceeded demand, and purchase prices, despite a guaranteed price, dropped by 2 per cent, except early potatoes. Since 1997, potato supply in the Slovak market has been adjusted to demand, especially what concerns the size of planted areas, and production slightly exceeded demand. Home market is protected against the import of cheaper potatoes, except early potatoes, until June 15. Market swings are due only to weather conditions, which is reflected in price fluctuations, and in the years reporting exceptionally good yields, in stagnant marketing (year 2000, Figure 4).

In 1999, the *oil crop* reported very good figures. The planted areas were enlarged by 62 per cent, yields were in a slump and supply increased by 34.9 per cent. In addition to the continuously stable marketing figures and more attractive prices, the reason for an increased supply was also a drop-out in the winter crop and the use of the available area for oil crop growing. Shielded by a good oil crop supply, the average purchase prices of rape maintained the level from the year before and the sunflower and soya prices plummeted. The increased oil crop

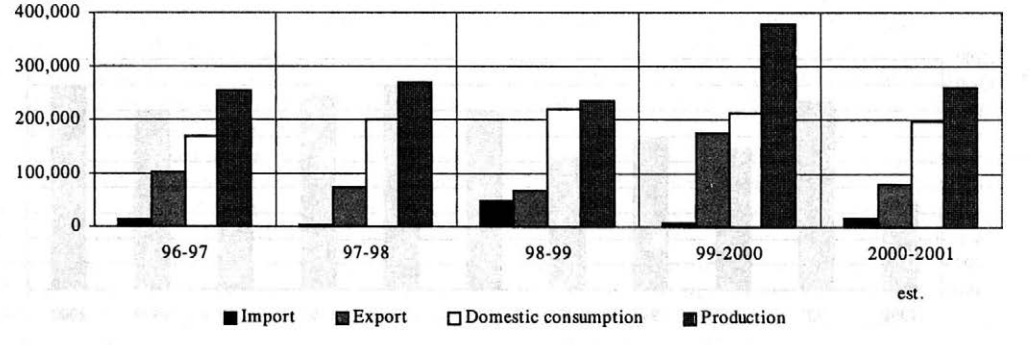

Figure 5. Oilseed balance structure in the SR in tonnes

production and supply enabled a higher export of this crop which accounted for the positive balance of foreign trade with these agricultural commodities. In 2000, domestic consumption declined, and due to the climatically adverse year, supply was limited; due to the effect of world prices, domestic prices were kept low until June; however, as of July, with a new marketing year, prices increased which facilitated an increase in the average annual prices of rape by 0.9 per cent and sunflower by 5.9 per cent (Figure 5).

Domestic market with *animal products* recorded an unfavourable development in the years 1999 and 2000, i.e. decline in the marketing of domestic agricultural products except milk. Several factors accounted for that, especially imports of subsidized commodities from the EU and more competitive goods from the neighbouring countries, notably CR, lingering financial crisis in agriculture and the ongoing restructuring of businesses largely through the privatisation of state enterprises (SE) and the establishment of new partnerships which favoured crop production.

The supply of the locally produced *milk* dropped by 6 per cent in 1999, which was due to a reduction in the number of milk cows by 9 per cent, or 26 000 head of cattle. In 1999, processing industry purchased 13 million litres of milk less than in the comparable period of the year before. The declared milk purchase quotas were not met. The production of dairy products by individual product types increased between 1.5 and 14.3 per cent, except powder milk and cheese, in which production decline was recorded. Given the fact that a fixed price on the purchase of raw milk was declared, the average price, which can only change with higher quality, declined only by 1 per cent. The share of milk and dairy product import in the total consumption moved from 8.2 per cent to 7.8 per cent in contrast with 1998. A slight improvement was recorded in the total deficit of foreign trade with dairy products.

In 2000, the decline in milk production slowed down (by 0.5 per cent year-on-year), due to a growing efficiency and cow milk demand. The growing dairy product export was a vehicle of the steadily growing demand. The deficit of foreign trade with dairy products improved by 16.73 per cent. A great portion of export was subsidised and a shortage in primary raw materials resulted in 8.7 per cent increase in the average milk purchase price. Processing dairy industry was prepared to absorb even larger quantities of raw cow milk, however, primary producers fail to meet production quotas in the long term and the recession in milk production lingers on.

An increase in the import of milk and dairy products, in milk by 44 per cent in the in-kind terms and 26.5 per cent in value terms, must be viewed very negatively. Also, a year-to-year increase in the import of liquid milk by 55 per cent, cheese by 54.9 per cent, and whey by 180 per cent raises concern. The export of domestic dairy products recorded increase in sour milk products by over 700 per cent.

The marketing and *production of slaughter beef cattle* continued to decline in 1999 and 2000. In 1999, a decline by 7 per cent was recorded and in 2000, by additional 11.4 per cent (Figure 6). This was largely due to 25–27 per cent lower sale of calves and a year-to-year attrition in slaughter beef cattle, including slaughter cows. This development was determined by a declining consumption of beef meat, by 10.5, or, 13.6 per cent year-to-year, and in 1999, by 30 per cent increase in import and 30 per cent drop in export. In 2000, the deficit of foreign trade with beef meat and cattle reported improvement, as import dropped by 7.8 per cent and export increased by 1 per cent. Decline in the slaughter beef cattle supply and the prospect of export prices exceeding domestic prices, and also an inflationary price increase in inputs , were reflected in a moderate increase of the average purchase prices of slaughter beef cattle by 1.2 per cent in 1999, and 1.7 per cent in 2000. The limited offer of slaughter animals during the year 2000 was the main cause of this increase, although toward the year's end, a slump in the beef cattle marketing was recorded due to the incidence of BSE.

In the latter half of 1999, changes in the marketing conditions in the *pig* domestic market, especially a marked increase of the duty on the import of pigs and pork and market regulation in the form of purchase price premiums

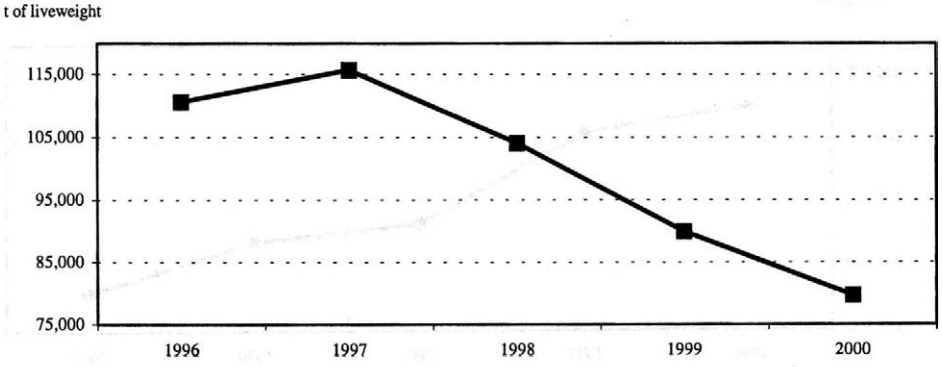

Figure 6. Marketing of slaughter beef cattle in the SR

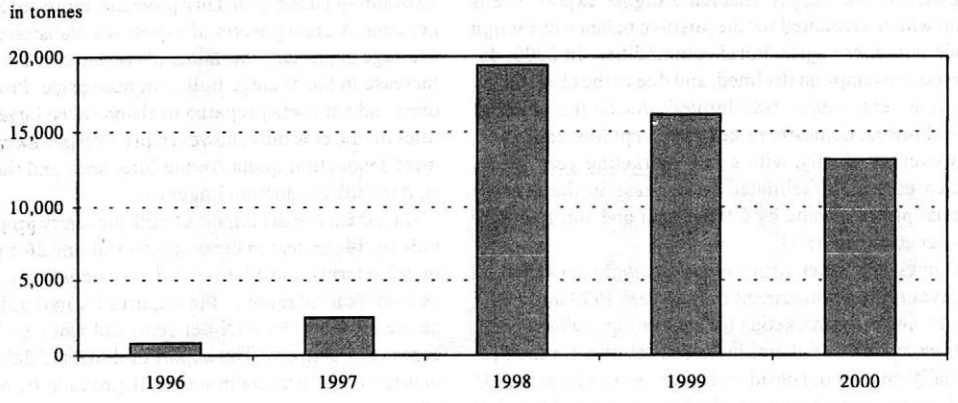

Figure 7. Import of pigs and pork in the SR

and intervention purchases, were reflected in the recuperation of prices paid by producers for slaughter pigs. As a consequence of these measures, pig sales went up. Despite that, the total number of pigs dropped by 1.9 per cent. The total supply of pigs for sale to processing industries dropped by 2.9 per cent in contrast with 1998. Domestic consumption was estimated to be 35.5 kg per capita, which was 1.4 kg less than in 1998. The import of pigs and pork dropped by 18.1 per cent in contrast with 1998, largely due to the introduction of a special safeguard duty, for a 200-day period. The country's capacity to export pork or slaughter pigs was not utilised (Figure 7).

In 2000, despite a changed import situation, pig offer continued to decline by 7 per cent p.a. Sales dropped by 4.3 per cent (Figure 8). In spite of pork shortage and price regulation through rather high minimum purchase prices, these prices went up only by 4.4 per cent, while processing prices increased by 8 per cent and consumer prices, depending on the type of meat, recorded an increase between 4.7 and 8 per cent.

In 2000, the pig market in the SR was characterised by a limited import of pork, increased demand for slaughter pigs, lower supply and price increase across the entire pork production chain which was due to a shortage of slaughter pigs.

In 1999, the *slaughter poultry* supply in the domestic market recorded a year-to-year increase by 6.5 per cent and the poultry meat supply, including import, went up by 7.7 per cent. This was a consequence of a growing poultry meat consumption, and its year-to-year increase was estimated to be 8.7 per cent. The marketing of slaughter turkey and slaughter chicken accounted the most for the supply and consumption increase (by 11.3 per cent and 10 per cent respectively). In 2000, a slump in supply was recorded due to lower prices, which was a consequence of the import of cheaper chicken. The negative balance of foreign trade with poultry and poultry meat deteriorated by 33 per cent year-to-year. In 1999, average sale prices of primary producers in slaughter chicken plummeted by 8.9 per cent, due to the import of cheaper commodities. Average consumer prices of

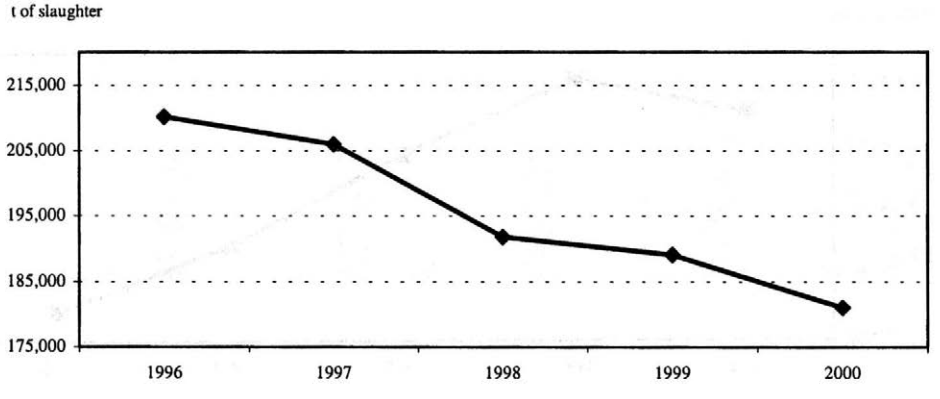

Figure 8. Marketing of slaughter pigs in the SR

dressed chicken fell by 10.7 per cent. In early 2000, average purchase prices and average consumer prices were maintained and for the greater part of the year, they stayed above the 1999 price level. This was conducive to an increase in the average slaughter poultry prices of producers by 3.9 per cent in contrast with 1999. As opposed to the identical period of the year before, only the average purchase price of the second class slaughter chicken recorded a drop.

Hens egg production dropped by 3 per cent due to a decline in the number of laying hens and also of slaughter chicken and egg yield. In this fashion, supply and demand were brought to balance, as egg consumption has been declining in the long run . This balance accounted for the fact that in 2000, in contrast with the year before, the average purchase price of hens eggs for human consumption was higher almost by 25 per cent.

The analysis of the *sheep product* market showed an overall stability of this market. Domestic sale of meat, wool, and cheese is downward-sloping, and export is the only vehicle of the sheep breeding development.

A positive role in stabilising sheep breeding is largely attributed to state support in the form of direct payment of SKK 600 per head in herds having 20 and more head of sheep, and also by export subsidies on sheep cheese. Sheep milk and slaughter sheep purchase prices increased, however, slaughter lamb prices plummeted by 17 per cent in contrast with 1997, which is attributable to their price decrease abroad.

The above development in marketing figures and the prices of sheep products and also the intent of the state to support continuously sheep rearing and the export of sheep dairy products indicate that as long as the entrepreneurs in sheep breeding keep reporting positive efficiency parameters, this sector of animal production has a development potential. The marketing of these commodities is especially important, and there are opportunities for its expansion and stabilisation largely through export.

REFERENCES

Izakovičová B. (2000): Analýza cien a cenovej parity na jednotlivých stupňoch potravinovej vertikály. Bratislava, VÚEPP, 13 s.

Ižáková V. et al. (1998): Agrárny trh v procese transformácie poľnohospodárstva. Bratislava, VÚEPP, 1998. s. 14–23.

Composite authors (1999): Analýza vývoja poľnohospodárstva a potravinárstva v období rokov 1990–1998. Bratislava, VÚEPP, 392 s.

Komoditné a situačné správy (1999, 2000). Bratislava, VÚEPP.

Arrived on 21st June 2001

Contact address:

Doc. Ing. Viera Ižáková, PhD., Výskumný ústav ekonomiky poľnohospodárstva a potravinárstva, Trenčianska 55, 824 80 Bratislava, Slovenská republika
tel.: +421 2 58 24 33 42, e-mail: izakova@vuepp.sk

Privatisation results in the agri-sector of the Slovak Republic

Výsledky privatizácie v rezorte pôdohospodárstva Slovenskej republiky

M. GUBOVÁ

Research Institute of Agricultural and Food Economics, Bratislava, Slovak Republic

Abstract: The paper gives an overview of the process of the state enterprises privatisation in the agri-sector. It briefly analyses the small-scale privatisation in agriculture and characterises its benefits and shortcomings. It elaborates on the facts that determined the large-scale privatisation. The paper lists the results of the large-scale privatisation according to branches, i.e. food industry, agricultural services and agricultural enterprises. The results are also presented with respect to the applied privatisation methods and, in agricultural enterprises, by the privatisation implementing agencies.

Key words: privatisation, legislation, direct sale, competitive bidding, the National Property Fund, the Slovak Land Fund

Abstrakt: Príspevok rekapituluje proces privatizácie štátnych podnikov v rezorte pôdohospodárstva. Stručne hodnotí malú privatizáciu v rezorte pôdohospodárstva a vymedzuje jej prínosy a obmedzenia. Deklaruje skutočnosti, ktoré determinovali proces veľkej privatizácie. Uvádza výsledky veľkej privatizácie samostatne za odvetvie potravinárstva, poľnohospodárske služby a poľnohospodárske podniky. Prezentuje ich aj z hľadiska uplatnených metód privatizácie a u poľnohospodárskych podnikov aj podľa realizátora privatizácie.

Kľúčové slová: privatizácia, legislatíva, priamy predaj, verejná súťaž, Fond národného majetku, Slovenský pozemkový fond

INTRODUCTION

The process of the national economy transformation after 1990 assumed the implementation of several system measures within the framework of which the transformation of ownership relations, as a basis for establishing a workable and competitive business structure, was assigned an important role.

Among the declared priorities of the agricultural transformation strategy, there has been the privatisation of state enterprises. Its completion is a precondition for the implementation of the structural changes in food industry, agricultural services, and primary production. The privatisation process has become the most delicate aspect of the Slovak national economy transformation. Since 1990, all the socio-economic and political changes have been, first and foremost, reflected in the privatisation process; the issue of privatisation has always been among the first to be addressed by each new government. This is related to the fact that, as regards the extent and quality of the change of ownership relations, the privatisation of state enterprises represents a unique process which is not to be repeated in history.

Since 1991, the privatisation process has undergone several changes which are an outcome of the development of the socio-economic and political situation in the national economy and have impacted the privatisation pace, the priority of a particular privatisation method, the prices of the privatised entities, and so forth. The earliest, or preparatory, stage of the transformation of the agri-food sector was the de-monopolisation and spin-off of the state enterprises that were under the authority of the Ministry of Agriculture of the SR and the subsequent de-nationalisation of part of the state enterprises.

Privatisation has also been affected by a complicated and tardy process of introducing the property in use evidence. Furthermore, the priorities of the economy transformation kept changing as a result of the frequent changes in the political and economic situation and their negative effects upon the microeconomic climate (changes in the political leadership, transfer of powers, territorial and administrative changes, etc.).

METHODOLOGY

Since the early years of privatisation, and especially with the onset of the state agricultural enterprises privatisation, the RIAFE has been collaborating with the founder on the solution of the current privatisation issues. In conjunction with the research task Current Privatisation Issues in Agriculture (1994–1998), the focus was largely on the solution of partial problems associated with the peculiarities of this process in the agri-sector. Annually, the task focus and methodology followed the then existing status and tasks of the agricultural sector following from the then privatisation strategy. The task solution was effectuated at the methodology, organisational, technological, consulting and evaluation levels. Given the nature of the issues under solution, partial

results of this research tasks have not been published more extensively.

Since the privatisation process in the agri-sector has almost come to an end, the paper presents an evaluation, or a summary of the privatisation course with respect to the present knowledge and focuses on the privatisation specifics and results. In a synthetic form, it offers partial knowledge from the solution of the research tasks between the years 1994 and 1998. These are expanded by up-to-date knowledge of these issues gathered within the framework of the solution of the research task the Results of the Monitoring of the Structural Changes in Agriculture and the Socio-economic Problems of Rural Regions, especially its output, the Transformation of Ownership Relations in Agricultural Primary Production After 1990. Available overviews of the privatisation status of the National Property Fund and the Slovak Land Fund were used as a complementary source of information.

PRIVATISATION RESULTS IN THE AGRISECTOR

Small-scale privatisation pursuant to the Act No. 472/1990 Coll.

As a rule, privatisation evaluation is narrowed down to the evaluation of the privatisation results in accordance with the Act No. 92/1991 Coll. on the transfer of national property to other persons (the so-called Large-scale Privatisation Act), as amended, and no account is taken of the small-scale privatisation implications pursuant to the Act. 427/1990 Coll. on the transfer of public/state ownership of some items to other legal or natural persons, as amended. The small-scale privatisation, which took place between the years 1991 and 1993, was not implemented in the agri-sector as massively as, for instance, the industrial sector, because agricultural enterprises were excluded from it. Small plants of food-processing companies, such as bakeries, mills, slaughter houses, canteens, snackbars, service plants and even complete companies were auctioned, which was outside the framework of the mentioned Act.

Originally, of the entire national economy, only 13,935 small plants were included in the small-scale privatisation. Of them, 9,667 were auctioned and of this number, 2,073 plants were sold in Dutch auctions. Asking (book) price for all the auctions totalled SKK 12.34 billion and the auctioned price SKK 13.96 billion. Almost in 60 per cent of auctioned plants, or independent holdings, lease was the object of auction.

A total of 54 auctioned plants (41 plants, or companies of the food-processing industry, 13 service plants) operating under the Ministry of Agriculture, with the asking price totalling SKK 627.57 million, accounted only for 0.56 per cent of the total number of auctioned plants and in asset terms, 5.83 per cent, i.e. SKK 813.71 million of the auctioned sum. They were auctioned at more attractive prices than other plants and the auctioned price was 29.66 per cent higher than the asking price, while in other auctioned plants, auctioned price exceeded asking price only by 13.13 per cent. Within the framework of the auctioned property under the authority of the Ministry of Agriculture, the highest prices were reported in food-oriented plants and companies and they exceeded the asking prices by 38.51 per cent. In the average, though, service-oriented companies did not reach the asking prices and were sold at 90.72 per cent of the asking price.

The use of an auction as the only form of sale was not the only peculiarity of small-scale privatisation; it was also interesting by the fact that among the objects of auctions, there were tangible and intangible assets that constituted a complete economic or property unit, i.e. net worth less loans, other liabilities, and industrial relations, etc.

There are some ambiguities in the evaluation of small-scale privatisation, largely due to the non-existence of some data on, for instance, the so-called related costs of small-scale privatisation. On the part of the Ministry for the Administration and Privatisation of National Property which implemented the privatisation via district privatisation committees, privatisation was viewed positively in most instances. This evaluation was based on the fact that the auctioned price was higher than the asking price and no account was taken of the effects upon the founder ministries which were burdened with the solution of the accompanying negative impacts of the small-scale privatisation.

Although the results of small-scale privatisation tend to be overestimated with respect to the facts mentioned above, some of its benefits are unquestionable, especially:

- rapid transfer of the declared volume of national property into private hands,
- immediate high income from the sale of auctioned plants, or holdings owned by the State,
- mobilisation of a high volume of available capital for auction purposes,
- establishment of a competitive environment in food-processing and other small-scale production, trade, and services,
- willingness to assume and to bear business risk by the majority of bidders, despite the limited, if any, business experience.

On the other hand, the participation of founder ministries in the small-scale privatisation was not given due attention. Despite the inter-ministerial agreements, the opinions of the founder, the Ministry of Agriculture of the SR, were not taken into account by privatisation committees. In addition to legal and procedural flaws, there were also other facts that cast doubt upon the process of the small-scale privatisation and its declared benefits, namely:

- income from the small-scale privatisation was not a state budget income; proceedings were kept on a separate account of the Ministry of Agriculture. In the light of

the present knowledge, the benefits of its use and the anticipated effects are questionable (support of the industry conversion, discharging debts of some state enterprises, bank rehabilitation, etc.)
- income from the small-scale privatisation was not proportionally distributed among the founder ministries the assets of which were auctioned. As regards the agri-sector, part of its property was auctioned at SKK 814 million, and from the special account, only SKK 105 million were transferred to be used by the sector for a biotechnology development programme
- the non-existence of the quantification of the economic benefits of the small-scale privatisation for the founder sector which was encumbered by liabilities (loans, accounts payable, payables to employees), dubious inventory and the like, associated with the auctioned property,
- breaching the legality in the selection of plants for small-scale privatisation – instances when, in conflict with the law, entire state enterprises were auctioned (1 brewery, 1 meat plant, 1 cannery, 1 peat plant) with the negative consequences for the founder as mentioned above,
- insufficient evidence of the title to the auctioned property – there were cases reported of auctioning assets that were pledged as an investment loan collateral, or, property that could be claimed back in restitution, etc. An accompanying problem of such procedures are legal court suits,
- after selling the core part of tangible and intangible property, there remained an in-operational state enterprise and the founder decided to liquidate it. If the liquidation balance proved insufficient for honouring the company's commitments, this obligation was then transferred onto the State via the relevant body. The claims of the remaining staff and original company management were also addressed by the founder. There was no monitoring or subsequent evaluation of the scale and economic impacts of such decisions of the Ministry for the Administration and Privatisation of National Property,
- last but not least, the small-scale privatisation was also connected with the setting up of affinity groups that manipulated the procedure and course of auctions and gradually infiltrated the economy.

Large-scale privatisation pursuant to the Act No. 92/1991 Coll.

In the agri-sector (except enterprises operating on land), the large-scale privatisation pursuant to the Act No.92/1991Coll., as amended, followed a similar trend to that in the other sectors of the national economy.

Based on a synthesis of partial data and present knowledge, it may be stated that the large-scale privatisation was contingent on, or accompanied by, several facts, notably:
- sweeping de-monopolisation and devolution of economic operators in the food-processing industry, services, and agricultural primary production, their subsequent spin-off and de-nationalisation of part of the newly-established entities within the preparatory stage of privatisation,
- thorough identification and evidence of the title to the property used by state enterprises which had been neglected prior to 1990. This was the most painstaking stage of privatisation (especially in state enterprises, in which part of buildings and structures was constructed from the operating funds without the relevant authorisation proceedings of the appropriate state administration bodies) and it managed to restore order in the ownership relations,
- in parallel, space was created for addressing restitution claims of the eligible persons in conjunction with the adopted restitution legislation. Their time limit was set by February 25, 1948, and only the natural persons with a permanent residence in Czechoslovakia, i.e. the citizens of Czechoslovakia, were eligible to fill in a restitution claim. In the agri-sector, the most extensive restitution claims were filled under the Act No. 229/1991 Coll.,
- in terms of type, volume, methods and time frame, privatisation was broken down into the small-scale privatisation pursuant to the Act No. 427/1990 Coll., and the large-scale privatisation pursuant to the Act No. 92/1991Coll. Originally, the large-scale privatisation was divided into 1st and 2nd privatisation waves, however, in the course of the privatisation implementation, by moving the unsold shares from one privatisation wave to the other and due to the changes in the company lists, the borders between the 1st and 2nd waves were effaced,
- at the central level, in connection with privatisation, new institutional arrangements were called for; therefore, the Ministry for the Administration and Privatisation of the National Property, the National Property Fund, and the Slovak Land Fund were established. The scale of the privatisation involvement of these individual legal entities varied; they were also vested with different powers and stepped into the privatisation process at different stages,
- for the first time ever, the voucher privatisation was employed as a unique method of privatisation, with the objective to give citizens equal opportunities to acquire property and to resolve the shortage of capital funding. Its implementation (and the connected fragmented ownership) was conducive to the establishment of various financial companies dealing in the investment vouchers. In the agri-sector, the voucher privatisation was implemented to a various extent in food-processing companies and service-oriented providers,
- the legislative act-drafting boomed, i.e. acts and secondary legislation, sector concepts, principles, their continuous amendment and updating, etc. (the basic legislative act, the Act No. 92/1991 Coll., has been amended 22 times since 1991, and it is associated with several findings of the Constitutional Court),
- gradually, the privatisation process was increasingly politicised. This was manifested in the fashion in which

privatisation was implemented, in the selection of the acquirers of privatised assets, purchase prices, terms and conditions of sale, etc. Non-standard criteria were applied in conjunction with the acquirer selection at the expense of economic criteria and opportunities were created for a group of persons for whom privatisation was a matter of one-time enrichment,
- the process of the state enterprise liquidation and bankruptcies was triggered off, in which a selective configuration of privatisation outputs was employed (for instance, the creation of the so-called "tailored" outputs at the expense of other outputs that were excessively encumbered with loans and other liabilities), or liquidation and bankruptcies of companies privatised for speculative reasons.

The legislative framework of privatisation was based on the laws and secondary legislation, part of which was focused on addressing the specific issues of privatisation in the agri-sector. It involved numerous ordinances, government resolutions, government policy statements that raised a need to elaborate sector materials (concepts, principles, up-datings, etc.). It should be noted that each of the concepts, principles, updatings, irrespective of the government changes, has declared a determination to resolve the existing problems, to conduct privatisation in a transparent fashion, etc.; however, the actual course and implementation of privatisation was different.

In the time course and in terms of material implementation, the actual course of privatisation in individual stages presented, more or less, a different picture from the original one. Socio-economic changes were reflected upon the privatisation pace and dynamic stages alternated with the periods of slump and even halting of the implementation of privatisation projects. Privatisation was increasingly turned into a political rather than economic issue.

In fact, the privatisation of agricultural state enterprises was completed by December 31, 1998. In 1999, due to the re-evaluation, the privatisation process was halted, and in 2000, four remaining agricultural state enterprises were included in privatisation.

The earliest list of enterprises and state holdings included in the 1st and 2nd privatisation waves was approved by the Resolution of the Government No. 443, of August 13, 1991. According to the mentioned list, 139 state enterprises with assets valued at SKK 34.5 billion were included into the 1st privatisation wave; of them, 90 were food-processing companies, 9 biological service companies that delivered services to crop production, 8 elevators, 8 engineering companies, 15 technological and construction service companies, 2 state farms, and 7 other service companies (sanitation companies, agricultural implements and preparations, state amelioration authorities). The list of companies included in the 2nd wave contained 201 state enterprises having the assets value of SKK 57 billion, of which 30 were food-processing companies, 94 state farms, 38 elevators, 25 technological and construction service companies, 9 biological service companies delivering services to crop production, and 5 other companies (Agris, Rašelina, Bioveta, and others); 9 enterprises with the assets value totalling SKK 302.3 million were to be liquidated (3 food-processing companies, 5 service companies and 1 state farm). The spin-off and liquidation of state enterprises, and especially the continuous legislative amendments and changes in the lists of companies to be privatised (especially the Government Resolutions No. 863/92, No.644/94, No.454/95, No.327/97), resulted in moving the enterprises, or the unsold shares, from the 1st to 2nd privatisation wave, and as regards the implementation of the projects of agricultural state enterprises, any distinction was no longer made between the 1st and 2nd privatisation stages, the exception being the enterprises that operated on land. Administratively, the 1st privatisation wave was completed upon the adoption of the document the Further Concrete Privatisation Steps in the SR, approved by the Government in September 1993. State agricultural enterprises were included into the 2nd privatisation wave.

The privatisation of food-processing companies

The privatisation of food-processing companies took place between the years 1991 and 1997. The companies were privatised within the 1st privatisation wave, in 1992–1993, by the virtue of the voucher privatisation, by the sale of company assets (direct sales, competitive bidding) and the sale of shares of the joint stock companies founded by the National Property Fund. In part of the privatised companies, combined sale was employed, i.e. the unsold shares from the 1st voucher privatisation wave were sold in the subsequent years. For this reason, the National Property Fund of the SR does not make a distinction between the sale of assets and the sale of shares realised in the 1st and 2nd privatisation stages.

The privatisation per se was preceded by sweeping structural changes in 1990-1991; these changes may be broken down as follows:
- de-monopolisation of marketing units and subsequent spin-offs of state enterprises (of the original 11 marketing units, 198 state enterprises were established)
- de-nationalisation of state enterprises, founding of joint stock companies,
- selecting small plants for the small-scale privatisation pursuant to the Act. No. 427/1990 Coll.
- honouring restitution claims pursuant to the Acts 403/1990 Coll. and 87/1991 Coll.
- selecting state enterprises for liquidation, or bankruptcy declaration due to poor management, etc.

Placing food-processing companies on the lists of privatised state enterprises was less dramatic than in agricultural enterprises. Changes took place only in conjunction with listing the companies to be liquidated, or in bankruptcy, or the equity data of a privatised enterprise were updated with the exclusion of buildings intended for state administration, for the purposes of free-of-charge transfers of assets, and the like. Tobacco industry and 2 non-standard sales were excluded from the evaluation for missing information.

Privatisation projects of 83 state enterprises of the food-processing industry were transferred onto the National Property Fund from the privatisation sector; these were to be privatised within the framework of the *voucher privatisation.* The voucher privatisation was implemented in 72 food-processing companies across the majority of the food industry branches. Starch producers, breweries and malt-houses, wine industry, fats and cosmetics industries, and tobacco industry were not privatised within the framework of the voucher privatisation.

The registered capital of enterprises in which the voucher privatisation was applied totalled SKK 8,203 million. Voucher privatisation accounted for 78.34 per cent, i.e. SKK 6.427 million of the total privatisation volume. In terms of the percentage share and privatised assets volume, the voucher privatisation predominated in milling, baking, and confectionery industries – 88.63 per cent, or, SKK 1,237 million (20 enterprises). Also, in the joint stock companies in poultry industry (including freezing plants) and dairy industry, the voucher privatisation was attributed a significant role (a high share in the other industries group was influenced by the Trebišov food-processing plant with the registered capital totalling SKK 1 billion; the plant was privatised in voucher privatisation).

Ten out of fifteen joint stock companies in dairy industry, i.e. over 66 per cent, were sold in the predominating voucher privatisation, in meat-processing industry, four out of six joint-stock companies, in poultry industry (including freezing plants), all twelve joint-stock companies, in milling, baking, and sugar industries, four out of six joint- stock companies, in canning, distilling, and non-alcoholic beverages industries, five out of 7 joint-stock companies, and in the remaining branches of food industry (machinery plants, engineering companies, food-processing plant), all six joint-stock companies. The remaining shares, which were left unsold in the voucher privatisation, were sold by the National Property Fund in the subsequent years. Based on the Fund information, of the original number of companies, 72 joint -stock companies have been declared bankrupt or liquidated in the past ten years.

Between the years 1992 and 1997, 92 food-processing companies via 138 outputs were sold (in the form of the *competitive bidding* or *direct sale).* As a rule, in the former state enterprises in which spin-offs down to the plant level were not effectuated, the enterprise was privatised via several outputs, or partial projects which followed the individual plant pattern (for instance, wine-making companies).

As regards the sale of the state enterprises in food industry, the assets of all the food branches were privatised in the total balance value of SKK 10,441 million. Sale, or purchase price represented 73.48 per cent of the balance value, i.e. SKK 7,672 million. Through sales, the most massive change in the ownership of food-processing companies was accomplished. As regards purchase prices, there were differences reported across the individual branches of food industry. In index terms (percentage of purchase price over balance value), the differences reported ranged between 51.53 per cent and 122.76 per cent. The highest prices in the sale of assets for a branch as a whole were reported in brewing and malt industries, i.e. 122.07 per cent, in sugar and confectionery industries - 120.07 per cent. The lowest prices were recorded in canning and distilling industries – 51.53 per cent, followed by meat industry – 54.76 per cent, and other industry branches – 54.58 per cent.

However, in the framework of concrete branches, differences were more substantial, and in individual sales, the lucrative position of a particular company or a plant was manifested. In 48 sales, i.e. 35 per cent of the total number of 138 sales, identical, or higher purchase prices than their balance value were recorded; in 34 sales, i.e. 25 per cent, purchase price equalled 50 and less per cent of the balance value.

It is believed that purchase prices were markedly affected by the amount of privatised debt (loans, liabilities). The information on the amount of privatised debt are not available and therefore it is not possible to compare purchase prices vis-à-vis privatised debt. At signing the purchase contracts, almost half of the new acquirers (41 per cent, or 57 sales) committed themselves to a certain volume of capital investments within an agreed time frame. As a rule, these investments also impacted the purchase price.

Privatisation in the form of assets sale was at its peak in 1992, when 52 sales were made out of the total 138. In 1997, when the privatisation of food-processing companies was drawing to an end, only 4 sales were realised. In the first three years, poultry plants including fish and freezing plants predominated the sales along with mills, bakeries, pastry and confectionery plants, part of the canning and distilling industries and breweries. Wineries were sold after 1994 (except 1 plant). After 1994, within the same industry branch, sales were realised at purchase prices that were lower than at the onset of privatisation in 1992.

Privatisation of food industry in the form of *the sale of the shares* of join-stock companies was commenced in 1994 (except companies with the entry of foreign capital, i.e. CSTP – Tobacco Industry, Figaro Bratislava, Milex Bratislava, Old Herold Farm, Obal Nové Mesto nad Váhom, and others). Shares were sold of part of the assets of joint stock companies that were left unsold from the 1st wave of voucher privatisation, and the assets of some joint- stock companies that were not included in voucher privatisation.

The registered capital of joint-stock companies in which shares were sold using direct sale or competitive bidding (58 sales in total) totalled SKK 7,404 million, and the number of shares sold amounted to SKK 3,740,821. The said number of sold shares accounted for 50.53 per cent of the issued shares. Their purchase price totalled SKK 1,685 million, i.e. SKK 450 per share.

The highest price per share was reported in brewing industry, i.e. SKK 1,159 per share, followed by canning and distilling industries – SKK 558 per share. This fact corroborated a trend of higher price quotations in the privatisation of breweries and malt-houses. Similarly to the previous two privatisation forms, in the case of share selling, variations were also recorded in price per share in one concrete food industry branch. If disregarding the sale of the Czechoslovak tobacco industry shares (CSTP), price per share of SK 1,000 and over was recorded only in six cases. When evaluating the selling of shares in the time course, more dramatic swings were recorded over the years, and the trend of a gradual drop of share prices was apparent.

The privatisation of service companies

The privatisation of service companies was implemented in a variety of ways, and it followed the existing structure of services and attained transformation level, which varied across the individual service groups between 1991 and 1992.

At the onset of privatisation, the nomenclature of the state service companies was as follows:

- biological service for crop production (Slovosivo, Semex, OŠM, and others),
- biological services for animal production (State Breeding Service, State Veterinary Administration, Bioveta, MOVIS, and others),
- elevators and supplies,
- technological and trade services (machine and tractor stations, repair shops of agricultural machinery, construction companies, engineering companies, computer technology companies),
- other service companies (sanitation companies, agricultural implements and preparations, and others).

In companies delivering services to *crop production,* spin-offs were completed as late as in 1994, and the successor entities that operated on land entered privatisation with other companies of agricultural primary production. An exception were some trading and seed service companies (3 state enterprises) which were included in the voucher privatisation. These enterprises were largely privatised in the voucher privatisation (i.e. between 78 and 93 per cent of registered capital), i.e., of the total registered capital value of SKK 263 million, SKK 222 million were realised in the voucher privatisation. Part of the service companies was sold via the National Property Fund which realised 6 sales of companies, or their parts (especially in 1997). Assets totalling the balance value of SKK 337 million were sold at a purchase price which equalled 22 per cent of the balance value. The selling of the shares of the joint- stock companies founded through the transformation of the former crop production service companies was realised in three companies, in which 55 per cent of shares were sold in the average, of which the whole companies were sold in two cases.

Part of the crop production service companies was transferred by the National Property Fund to the Land Fund for sale, whereby the latter realised six sales of service companies between the years 1995 and 1998 (3 in competitive biddings and 3 in direct sales). These were largely sales of smaller companies (breeding stations) in a total value of SKK 129 million which were sold for SKK 60 million, i.e. 47 per cent of the balance value. In parallel, the sale of the shares of four joint stock companies was realised in 1996.

As regards *animal production service companies,* specifically breed formation and veterinary services, as early as 1992, within spin-offs, an action was taken to separate business activity and privatise it. For the privatisation purposes, the independent state enterprises operating on land (8 in total), that were de-coupled from the State Breeding Company, were evaluated together with agricultural enterprises. 4 stud farms that belonged to the former horse breeding enterprise and stud farms that were transformed into joint-stock companies in 1996, with 100 per cent holding of the National Property Fund, were placed on the privatisation list. Between 1997 and 1999, these companies were privatised.

In 19997 and 1998, two stud farms were privatised at a purchase price of SKK 7,143 thousand which accounted for 10.15 per cent of the reported balance value. The shares of other stud farms were objects of sale in 2000, however, their sale has not been finished yet. In 1995, based on the minister's decision, the breeding services were leased and in 1997, selected for privatisation. Their privatisation was commenced in 2000 via 14 privatisation outputs, and to date, it has not been completed. The national stud farm Topolčianky, the Race Course Bratislava, and the State Veterinary Administration and its organisational units were not placed on the list of the privatised companies.

Of the animal production service companies and other biological service companies, rendering plants, a gelatine-producing plant, and the MEVAK joint-stock company were among the privatised companies. Between 1992 and 1997, the National Property Fund managed to sell 10 companies or their shares. The highest purchase prices or share prices were recorded in conjunction with the sale of sanitation and rendering plants (over SKK 1,000 per share).

Elevators were more massively included into the voucher privatisation in 1992–1993, except 4 elevators which were excluded from the agri-sector for strategic reasons. In total, 28 elevators with the registered capital totalling SKK 3,376 million were included in the voucher privatisation, of which SKK 2,871 million worth of assets were privatised, i.e. 85 per cent. 8 elevators were fully privatised using the voucher method. Other elevators, or, un-privatised shares from the 1st voucher privatisation wave, were objects of sales via the National Property Fund in the years that followed. In conjunction with the sales (competitive bidding, direct sale), a significant difference between the 1992 purchase prices (5 sales)

and purchase prices after 1994 is apparent. While in 1992 the purchase price accounted for 117 up to 305 per cent of the balance value, from 1994 onwards, it was only 6 to 83 per cent. In total, 13 sales of elevators totalling SKK 549 million in balance value and a purchase price of SKK 127 million were reported, i.e. purchase price to balance value rate averaged 21 per cent. The sale of the shares of the elevator joint-stock companies was carried out between the years 1994 and 1996; altogether, 19 share sales were realised. The object of sale were the shares between 15 and 97 per cent of the total number of issued shares of the particular elevators. In total, a purchase price of SKK 129 million was recorded and the average price per share over the entire period was SKK 159. Price per share ranged between SKK 42 and 400.

Technological and other service companies included machine and tractor stations (MTSs), agri-metals, agricultural structures, engineering companies, and computer technology companies. The privatisation of technical services was largely effectuated via the National Property Fund, and in 1995–1998, partly by the Slovak Land Fund.

The voucher privatisation was used on a most massive scale in agricultural structures and engineering companies. In total, 17 companies with registered capital totalling SKK 505 million were privatised in this fashion. Assets were sold at a price of SKK 413 million, i.e. 81.74 per cent of the total registered capital value. In three cases, 97 per cent of the company assets were sold, i.e. using voucher privatisation, companies were sold in packages. A supplementary form of sale were the sales of the shares of technical service joint stock companies. Sales were the major form of the realisation of the highest number of companies and the highest volume of assets. Direct sale and competitive bidding were among the forms predominating the sale of machine and tractor stations and agri-metals. Altogether, 36 sales of companies were carried out, or, their parts, with a total balance value of SKK 1,190 million; they were sold for SKK 385 million. In machine and tractor stations and agri-metals, purchase prices accounted for 10 to 50 per cent of the company balance value, and no dramatic differences were recorded in their prices in individual sales. Construction companies were sold at higher prices, in 2 cases, their balance value was exceeded.

The Slovak Land fund arranged for 16 sales (12 competitive biddings and 4 direct sales). Machine and tractor stations were among the most frequent objects of sale. In the average, the prices for which the Slovak Land Fund realised sales doubled the prices of the National Property Fund, whereby in direct sales, the average prices were by 20 per cent lower than in competitive biddings. The Land Fund arranged for the privatisation of assets having a balance value of SKK 237 million; these assets were sold for SKK 200 million, i.e. 84 per cent of their balance value. This corroborated a trend of higher purchase prices in sales arranged by the Fund. In one case, company shares were sold.

By December 31, 2000, the privatisation of 2 service providers was not completed, largely due to unresolved restitution claims.

In conjunction with the privatisation of food-processing companies and service companies, the issue of the interconnection of primary agricultural production and the processing branches of food industry and services was a problem which has been continuously addressed and yet remained unresolved. All the adopted privatisation concepts and principles, the policy statements of former governments declared readiness to "reserve" a stake in the privatised assets of food companies for the primary agricultural production. The National Property Fund responded to these efforts and in the Draft of the Concept of the Use of Shares in the Ownership of the National Property Fund, a list of joint-stock companies was drawn up (19 in total) in which shares for the agricultural primary production were "reserved". Of the above number, 16 food-processing companies (8 dairy plants, 3 meat plants, 3 poultry plants, 1 freezing plant, and 1 sugar factory) disposed of shares up to the registered capital amount of SKK 427,284 thousand (i.e. between 5 and 30 per cent of the amount of the registered capital of a particular enterprise). Other companies belonged to the service category. The shares were reserved for 6 months. Primary agricultural producers that were often faced with existential problems and a shortage of available capital (given the then existing credit policy) did not have any chance to become more powerful players with a relevant influence in these companies. Their effort to collect the receivables from the companies in the processing industry was not materialised. As regards the co-ownership, the primary agricultural production was most successful in dairy industry, and, in 6 to 8 cases, it managed to acquire the relevant influence. However, the ownership structure of the privatised food and service companies is in the process of change and so are the co-ownership proportions.

The privatisation of state agricultural enterprises

Of the state enterprises that operate on land, the following were included in privatisation:

- state farms
- seed and other state enterprises de-coupled from Semex and Slovosivo state enterprises
- fruit-growing state farms de-coupled from the fruit-growing state farms at Stupava and Sabinov
- state enterprises of the former State Breeding Company
- state enterprises of the former Rybochov Stupava state enterprise
- state enterprises of former concerns and the agri-sector.

After numerous changes and replacements in the privatisation lists, 126 state agricultural enterprises were included in privatisation. By December 31, 1999, two were not privatised and were recommended for liquidation or bankruptcy. 124 privatised agricultural enterprises were sold in 161 privatisation outputs. The implementing agencies of privatisation, which was especially intense between the years 1994 and 1998, were the Slovak Land

Fund and the National Property Fund. Enterprises were privatised in complete packages, or the enterprise assets were divided and privatised in several outputs. As a rule, the output configuration responded to the demand for the privatisation of independent functioning parts of an enterprise, and the number of outputs ranged between 1 and 10. The majority of enterprises were privatised in packages.

In the enterprise privatisation, the Slovak Land Fund opted for the establishment of joint-stock companies, followed by sale of shares, competitive biddings, and direct sales. Altogether, the Fund established 13 joint-stock companies from the former state farms. Between 1995 and 1997, the shares of these companies were sold in competitive biddings or direct sales. Shares totalling SKK 1,416 million were sold, of which 60 per cent were sold in direct sale and 40 per cent in competitive bidding. In case of sales, the purchase price totalled SKK 412 million. i.e. the proportion between the purchase price and the total price of sold shares was 28.15 per cent in direct sale, and 30.51 per cent in competitive bidding.

The Slovak Land fund managed to sell 67 per cent of the issued shares of privatised companies. In case of sales, price per share averaged SKK 291 over the entire period under survey. The vital portion of shares, 72.35 per cent of the volume of sold shares, was sold in 1996. Starting from 1995, share prices steadily declined. The lowest price per share in the individual sale was reported in 1996, i.e. SKK 80, and the highest in 1995 – SKK 750 (in both cases, the major portion of company shares was sold). In the mid 1997, the Slovak Land Fund transferred the outstanding shares to the National Property Fund in exchange for the shares of the Restitution Investment Fund which were used for restitution compensations.

In the company asset selling, competitive bidding and direct sale methods were employed by the Slovak Land Fund on a more massive scale than the establishment of a joint- stock company followed by the sale of company shares. Between 1994 and 1999, the SLF realised 31 competitive biddings and 35 direct sales within the framework of which state agricultural enterprises in a book value of SKK 5,368,205 were sold for SKK 1,394,480 thousand. The greater part of the assets, i.e. 78.07 per cent, was sold in direct sales.

Privatisation was at its climax in 1996, when 56.06 per cent of all the sales of agricultural enterprises were realised, with the direct sales predominating. The object of privatisation were 71.09 per cent of the assets of agricultural enterprises included in privatisation, whereby the sales reported the lowest purchase prices. Purchase prices accounted for 19.96 per cent of the book value, and the economic benefit of privatisation via competitive bidding varied from that of direct sales. Each year, purchase prices in direct sales were lower than in the competitive biddings, and for the entire privatisation period, purchase prices in the direct sales were lower than in the competitive biddings by 10.93 per cent.

In the case of the privatisation of state agricultural enterprises, acquirers were allowed to pay up to 50 per cent of the purchase price of privatised assets in the form of mandatory investments based on an arrangement agreed beforehand (i.e. amounts and payment schedule). In direct sales, SKK 100 of purchase price to SKK 62 of investments were recorded, in competitive biddings, the volume of mandatory investments totalled SKK 18 per SKK 100 of purchase price.

In competitive biddings, over the entire period under survey, purchase price accounted for 34.51 per cent of the book value of the privatised entities. The predominance of higher purchase prices in competitive biddings as opposed to direct sales indicates the fact that in 45 per cent of competitive biddings, purchase prices reached over 50 per cent of the book value of privatised assets, while in direct sales, only 17 per cent.

The implementation of the privatisation projects of agricultural enterprises was commenced by the National Property Fund in 1996. Sales of enterprises predominated, and only in 4 state agricultural enterprises, 5 joint-stock companies were established. Of them, in four, the share-selling was carried out, and in one, the selling of shares is still under way. The registered capital of established companies totalled SKK 321,455 thousand of which capital worth of SKK 296,330 thousand was sold. The total realised sales amounted to SKK 28,729 thousand, i.e. 1 share was sold for SKK 10 on the average.

A vital portion of assets was privatised by the National Property Fund by sales, 78 in total, in which assets having a book value of SKK 5,704 million were sold for SKK 997 million. Purchase price accounted for 17.48 per cent of the book value of privatised enterprises. The sale of enterprises was at its climax in 1997, when 55 per cent of all the sales were carried out. At that time, sales were at their "cheapest". At the National Property Fund, a trend to reduce purchase prices in contrast with the book value of privatised assets was manifested quite clearly. Over the entire period of the privatisation of state agricultural enterprises, assets totalling a book value of SKK 14 billion were privatised and sold for SKK 2.8 billion, whereby the National Property Fund was left with the unsold shares of joint-stock companies in an original book value of SKK 1.2 billion.

Of the total of 161 privatisation outputs of state agricultural enterprises, 49 per cent were effected by the Slovak Land Fund, 51 per cent by the National Property Fund. The entities that ensued from privatisation were largely partnerships, 89.75 per cent in total (7.69 per cent joint stock companies, 82.06 per cent limited liability companies), and natural persons to a lesser extent (7.69 per cent), and co-operatives (1.92 per cent). In one case (0.64 per cent), the acquirer was a publicly traded company.

The sale analysis has shown that by privatising state agricultural enterprises, the transformation of ownership was not completed. In part of the privatised entities, the transformation of ownership structure is still an ongoing process. The acquirer ownership structure is composed of the:

– original management,

- natural and legal persons from the agricultural primary production,
- natural and legal persons from the agri-sector, outside primary production (food industry, agricultural services),
- natural and legal persons outside the agri-sector,
- a combination of the groups of owners mentioned above.

Among the most stable groups of owners are groups that also include successful management of former state enterprises. Their approaches and expectations of the further development of privatised companies are more realistic and they are keen to continue developing agricultural production. They are dedicated to enterprise in agricultural primary production and make appropriate decisions to promote production. Ownership structures of younger and middle-age categories and those that are backed by their families and have successors in their offspring have proven to be more active and creative.

CONCLUSION

The original plans of the privatisation of state agricultural enterprises in the agri-sector have been met neither in time nor with respect to the privatisation procedure. In the early stage of their privatisation, a lot of facts remained unknown and by their gradual surfacing, the processing of privatisation projects and the course of privatisation was made more complicated. Neither the approved privatisation methodology which was mandatory for the processing of privatisation projects, nor the applicable legislation took account of these facts. Based on the current analysis of the privatisation course, these groups of facts may be broken down as follows:

- number and territorial location of the intangible property of privatised enterprises,
- standard of the bookkeeping discipline and disparity between the economic and asset record-keeping, or reporting of the assets in use,
- arrangements connected with the settlement of the property issue arising out of the spin-offs of state enterprises,
- time-consuming nature of the gathering of legal documentation which evidences entitlement to the assets in use by state agricultural enterprises,
- fragmented land ownership and complicated evidencing of title to land, with emphasis placed on the identification of the owners of built-up and other areas of land,
- extensive restitutions, separate legislative solution of the restitution claims and compensations in state agricultural enterprises,
- the operation of the State Land Fund and its intervention into the privatisation of state agricultural enterprises as :
  - administrator of intangible property and the second entering entity,
  - body executing legal and organisational and technical acts connected with the privatisation implementation,
  - body executing recognised restitution claims, with the State as the obliged body,
- access to information, competence and approach of the company management to privatisation preparation,
- cost demands of the processing of privatisation projects, including their updating,
- continuous socio-economic and political changes, their impacts upon the privatisation course and strategy, frequent changes in the privatisation procedure and pace,
- legislative framework of privatisation (frequent amendments of legislative acts and secondary legislation),
- lack of uniformity in the approaches of the public administration bodies across the individual regions, their overburdening and ever-growing requirements on various opinions, authorisations, decisions, and the like.

An expected outcome of privatisation and transformation processes is the transparency of ownership relations, gradual stabilisation of businesses, and minimisation of the economic role of the State in the form of direct interventions into the microeconomics. Given the specifics of the agri-sector, this expectation in the agri-food sector has implications different from those in the other entities of the economy. However, transformation processes are an inevitable precondition for the materialisation of the declared integration efforts of the Slovak Republic.

REFERENCES

Ambrózyová M. (2000): Výsledky monitorovania štrukturálnych zmien v poľnohospodárstve a sociálno ekonomických problémov vidieka. Bratislava, VÚEPP, 62 s.

Gubová M. (2001): Transformácia vlastníckych vzťahov v poľnohospodárskej prvovýrobe po roku 1990. Bratislava, VÚEPP, 66 p.

Gubová M. (1999): Výsledky privatizácie v organizáciách APK. Výskumné práce 1999, Bratislava, VÚEPP, s.168–172.

Arrived on 21st June 2001

Contact address:

Mária Gubová, M.Sc., CSc., Výskumný ústav ekonomiky poľnohospodárstva a potravinárstva, Trenčianska 55, 824 80 Bratislava, Slovenská republika
tel.: +421 2 58 24 32 47, e-mail: gubova@vuepp.sk

Land classification in the Slovak Republic according to the new European Community regulation

Kategorizácia pôdy Slovenskej republiky podľa nového nariadenia Rady európskeho spoločenstva

M. FITZ

Research Institute of Agricultural and Food Economics, Bratislava, Slovak Republic

Abstract: The paper elucidates the classification of the agricultural land fund of the Slovak Republic with respect to Council Regulation (EC) No. 1257, of 1999, based on which the less-favoured areas are classified, or compensatory allowances are granted to farmers that operate in these areas. The paper provides the most recent data based on which agricultural land is included in the groups of less-favoured areas, whereby the data of the national pedology and economic data base on the land and climatic conditions in the Slovak Republic are used as extensively as possible.

Key words: EU regulations, less-favoured areas, Agenda 2000, EU Structural Funds

Abstrakt: Príspevok sa zaoberá kategorizáciou poľnohospodárskeho pôdneho fondu Slovenskej republiky vo vzťahu k Nariadeniu Rady Európskej komisie č. 1257 z roku 1999, na základe ktorého sa vymedzujú znevýhodnené oblasti, resp. poskytujú vyrovnávacie príspevky na kompenzáciu nízkej dôchodkovosti poľnohospodárom hospodáriacim v týchto oblastiach. Poskytuje aktualizované údaje o zaradení poľnohospodárskej pôdy do znevýhodnených oblastí, pri maximálnom využití výsledkov domácej pôdoznaleckej a ekonomickej databázovej základne o pôdnych a klimatických podmienkach Slovenskej republiky.

Kľúčové slová: nariadenia EÚ, znevýhodnené oblasti, Agenda 2000, štrukturálne fondy EÚ

INTRODUCTION

Within the framework of Slovakia's preparation for the EU accession, the legislation of the Slovak Republic is being gradually harmonised with the applicable EU legislation. In compliance with this process, the classification of the agricultural land fund is being updated as an outcome of the application of a new Council Regulation (EC) No. 1257/1999 (which links up with the original EC regulations No. 268/1975 and 950/1997), based on which compensatory allowances may be granted to offset the low income of farmers who farm in less-favoured areas. Less-favoured areas and areas with environmental restrictions are areas which are characterised by less favourable natural, demographic, and socio-economic conditions due to which farmers in these areas are faced with serious existential problems. Using the EU structural funds, the objective of the support to these areas is to maintain and develop sustainable systems of farming, the countryside, and habitation.

METHODOLOGY

The starting point for the application of the classification system are criteria set forth in Council Regulation (EC) No. 1257/1999, on the funding of rural regions from the European Agricultural Guidance and Guarantee Fund (EAGGF), especially Chapter 5, in which less-favoured areas and environmental restrictions are set forth. The criteria spelled out in the said document are not clearly quantified and are to be understood as framework criteria. Every state proposes these criteria based on its national conditions and information sources, and substantiates them relative to its population and the EU representatives, the latter being the providers of support to less-favoured areas. However, the Council Regulation (EC) No. 1257/1999 is conceived much more broadly than just a support to farmers. Its goal is to establish the framework for the sustainable rural development support and it ties into regional programmes. It contains such instruments as early retirement, more efficient production processing, training activity, support for young farmers, and so forth. The complexity of the definition of the less-favoured areas concept and areas with environmental restrictions in the Slovak Republic is contingent to the fact that it entails a sweeping qualitative change in the understanding of the criteria application methodology in contrast with the currently used approach to the classification of an agricultural territory pursuant to the Order of the Ministry of Agriculture of the SR No. 3809/1/2000-100, of December 18,

2000, which lays down cadastral territories falling under the individual agriculturally less-favoured areas.

The Slovak Republic, for the purposes of the less-favoured area definition, has been using long-term a comprehensive land classification information system in which the basic mapping-out and valuation unit is the soil evaluation ecological unit and its characteristics at the cadastral level. In their information systems, the EU Member States use municipality as the basic territorial unit which corresponds with the NUTS 5 statistical unit (Nomenclature des unités territoriales statistique).

According to the Council Regulation (EC) No. 1257/1999, Art. 17, less-favoured areas are broken down into:
- mountain areas (Art. 18)
- other less-favoured areas (Art. 19), and
- areas affected by specific handicaps (Art. 20).

Pursuant to Article 16 of the Council Regulation (EC) No. 1257/1999, payments to compensate for costs incurred and income foregone may be made to farmers who are subject to restrictions on agricultural use in the areas with environmental restrictions as a result of the implementation of the limitations on agricultural use based on the Community environmental protection rules, if and insofar as such payments are necessary to solve the specific problems arising from those rules.

CLASSIFICATION CRITERIA OF THE LESS FAVOURED AREAS IN THE SLOVAK REPUBLIC

Criteria for the definition of mountain areas (Article 18)

Mountain areas shall be those characterised by a considerable limitation of the possibilities for using the land and an appreciable increase in the cost of working it due to the existing altitude, the presence of slopes, or a combination of these two factors. Mountain areas in the Slovak Republic are characterised by:
- altitude over 700 m
- altitude over 600 m
- more than 20 per cent inclination (12°)
- combination of the altitude over 500 m and inclination over 12 per cent (7°).

According to the above criteria, such agricultural land was included into mountain areas in which the share of such land in a cadastral territory (CT) constitutes more than 50 per cent of the total area . Land classification was conducted using the climatic region (CR) code in the soil evaluation ecological units. Agri-climatic regionalisation was carried out in such a fashion that CR 08 mostly contours 500 m altitude, CR 09, mostly 600 m altitude, and CR 10, mostly 700 m altitude and more. The basic territorial unit for the classification of less-favoured areas was the cadastral territory (CT).

Classification criteria of other less favoured areas (Article 19)

According to Article 19, less-favoured areas are characterised by the presence of land of poor productivity and production which is an outcome of the low productivity of the natural environment, or, by low or dwindling population predominantly dependent on agricultural activity, the decline of which would jeopardise the viability of the area concerned.

A contentious methodological issue of the hitherto solution proposals was the spelling out of the criteria for the classification of other less-favoured areas falling under Article 19; comparative economic indicators were sought for setting land productivity that would converge on the criteria and usage of the Member States. Based on the selection of particular indicators, the agricultural land productivity was set using the criteria as follows: gross annual rental effect (GARE) which takes account of the economic essence of land productivity as a difference between the parameter-based production and prescriptive per hectare costs in crop production:

$$GARE = CpP - (nNpP + nZ)$$

where:
CpP – parameter-based production price
$nNpP$ – prescriptive costs of parameter-based production
nZ – prescriptive profit (10 per cent)

Based on this criterion transposed into the point rating system (land with the highest GARE/ha is rated 100), such agricultural land was included in the other less-favoured areas group pursuant to Art. 19, which was rated 37 points and this rating represented a nation-wide average (with a possibility of use below 80 per cent of the national average, i.e. 30 points). Land productivity expressed by the gross annual rent effect in SKK per hectare is an integral indicator of the land-climatic and economic conditions and eliminates the shortcomings of the hitherto applied land price groups.

At this stage of solution, socio-economic and demographic criteria for the classification of other less-favoured areas were not applied, because of the need to compare the current state with the results of the application of the criteria of the Council Regulation (EC) No. 1257/1999, whereby the current state is governed by the Order of the Ministry of Agriculture of the SR No. 3809/1/2000-100, of December 18, 2000, which stipulates cadastral territories that fall under the individual agriculturally less-favoured areas.

Criteria defining areas affected by specific handicaps (Article 20)

According to the EU criteria, in areas affected by specific handicaps, farming should be continued where necessary, in order to conserve or improve the environment or the countryside and preserve the tourist potential of

the area. The selection of the criteria for the classification of the areas affected by specific handicaps was more complex, as agricultural land with various natural peculiarities, for instance, of land, may be included in these regions: Žitný ostrov (Rye Island), East Slovakian Lowland, Transmontane region, flysh band, Rimava-Lučenec region, or land with a specific management system, such as protected landscape areas, national parks, and water hygiene protection zones (Article 16). Agricultural land with the following characteristics was included in the group of areas affected by specific handicaps:

- light sand soils (without restricting conditions)
- very heavy soils (without restricting conditions).

RESULTS AND DISCUSSION

Based on the above criteria and the application of the Council Regulation (EC) No.1257/1999, agricultural land having the following area of land and handicap characteristics was included in the mountain areas in the SR:

Handicap characteristics:	Area of land in ha
– altitude over 700 m	254,948
– altitude over 600 m	165,840
– inclination over 20% (12°)	129,151
– combination of altitude over 500 m and inclination over 12 % (7°)	79,219
Total SR	629,159

Mountain areas account for 26.5 per cent of the total area of agricultural land in the SR. More than 50 per cent of such land is reported in 22 districts, more than 40 per cent in 25 districts, and more than 35 per cent in 28 districts. In terms of the socio-demographic indicators, in districts that report more than 50 per cent share of agricultural land in mountain areas (by December 31, 1999):

- unemployment rate was between 9.3 per cent (Banská Bystrica) and 31.2 per cent (Gelnica), whereby in 64 per cent of these districts more than 20 per cent unemployment rate was reported,
- share in the average monthly earnings ranged between 71 per cent (Sabinov) and 96 per cent (Brezno)
- the highest drop in the population due to migration was reported in the districts of Tvrdošín –3.2 and Gelnica – 2.7 inhabitants per 1,000 inhabitants
- population density was below the national average in 68 per cent of districts, whereby the districts of Gelnica and Brezno did not even reach 50 per cent of the national average
- generally, rating of this land (although it is not a criterion) was below 30 points on a scale of 100.

Other less favoured areas

Pursuant to Article 19 of the Council Regulation (EC) No. 1257/1999, agricultural land with the following rating is included in less-favoured areas:

Handicap characteristics (GARE in points)	Area of land in ha
0–13.0	79,684
13.1–17.0	116,305
17.1–21.0	137,013
21.1–25.5	137,179
25.6–30.0	120,145
30.1–33.5	98,524
33.6–37.0	72,194
SR in total	761,043

Less-favoured areas falling under Article 19 are characterised by land of poor fertility. It accounts for 32 per cent of the total area of agricultural land. 27 districts report more than 50 per cent of such land, and more than 40 per cent is reported in 32 districts. In terms of the socio-demographic indicators, in districts with more than 50 per cent share of agricultural land in other less-favoured areas (at December 31, 1999):

- unemployment rate ranged between 7.7 per cent (Trenèín) and 37.4 per cent (Rimavská Sobota), whereby in 26 per cent of districts more than 30 per cent unemployment rate was reported,
- share of these districts in the average monthly earnings ranged between 71.5 per cent (Snina) and 91.7 per cent (Humenné), excluding the districts of the city of Košice
- the highest drop in the population due to migration was reported in the districts of Poltár –4.1 and Myjava –1.4 inhabitants per 1,000 inhabitants
- population density was below the national average in 70 per cent of the districts, whereby 9 districts were below 50 per cent of the national average, 4 districts below 40 per cent, and the district of Medzilaborce did not even reach 30 per cent of the national average.

Areas affected by specific handicaps

Given the need to resolve the issues that follow from the passing of the law on natural and landscape protection and the Ordinance of the Government on the compensation of damage to property of agricultural entities that operate in a territory with protected water resources, land with the following characteristics has been included in the areas affected by specific handicaps:

Handicap characteristics:	Area of land in ha
– light sand soil (without restricting conditions)	69,143
– very heavy soils (without restricting conditions)	57,474
SR in total	126,617

According to the above handicap characteristics, areas affected by specific handicaps account for 5.3 per cent of the total area of agricultural land. According to Article 21 of the Council Regulation (EC) No. 1257/1999, the total extent of these areas may not exceed 10 per cent of the area of the SR which creates room for the inclusion

of an area with a specific management system, such as, for instance, national parks, protected landscape areas, and water hygiene protection zones.

According to the applied criteria set forth in Articles 18-20 of the Council Regulation (EC) No. 1257/1999, approximately 1,500-1,700 thousand hectares of agricultural land may be included in the less-favoured areas in the SR on the condition that in the negotiation process, the SR will be able to substantiate the use of the cadastral territory as the basic territorial unit, or the setting of the altitude using the climatic region indicator and other differences ensuing from the application of the land classification information system applicable in the SR. The highest proportion of the agricultural land in less-favoured areas (100 per cent) is reported in the districts of Čadca, Dolný Kubín, Námestovo, Tvrdošín, Detva, Brezno, Banská Štiavnica, Snina, Stropkov, Stará Ľubovňa, Gelnica, Spišská Nová Ves, Ružomberok, Myjava, Martin, Liptovský Mikuláš, Košice II, and Košice III. The biggest differences in LFA in contrast with the present state are reported by the districts of Komárno, Levice, Košice environs, and Veľký Krtíš. These difference ensue largely from the application of the less-favoured area criteria that require some re-evaluation.

Setting compensatory allowance rates for less-favoured areas

According to Article 14 of the Council Regulation (EC) EC No. 1257/1999, farmers in less-favoured areas are eligible for financial support in the form of compensatory allowances. Compensatory allowances which have been designed to offset the disadvantages that follow from farming under less favourable natural conditions are set at a level which adjusts GARE of the respective cadastral territories which is negative, or lower than the national average, i.e. SKK 1,500/ha (mountain areas – Figure 1 and other less-favoured areas –Figure 2). This means that all the agricultural holdings which operate on such land will be granted no less than the above amount (the amount of compensatory allowances will be contingent on the SR gross domestic product and its agricultural policy at the time of its accession to the EU). According to the proposed method, compensatory allowances will be paid depending on the type of the specification of the agricultural land handicap and its classification into categories (subgroups) as follows:

Mountain areas – compensation for higher costs in more difficult natural and climatic conditions

Handicap characteristics:	Compensation in SKK/ha	Eligible in mill. SKK
– altitude over 700 m	2,300	586
– altitude over 600 m	2,200	365
– inclination over 20% (12°)	2,100	271
– combination of altitude and inclination of 12° (7°)	2,000	159
SR IN TOTAL		1,381

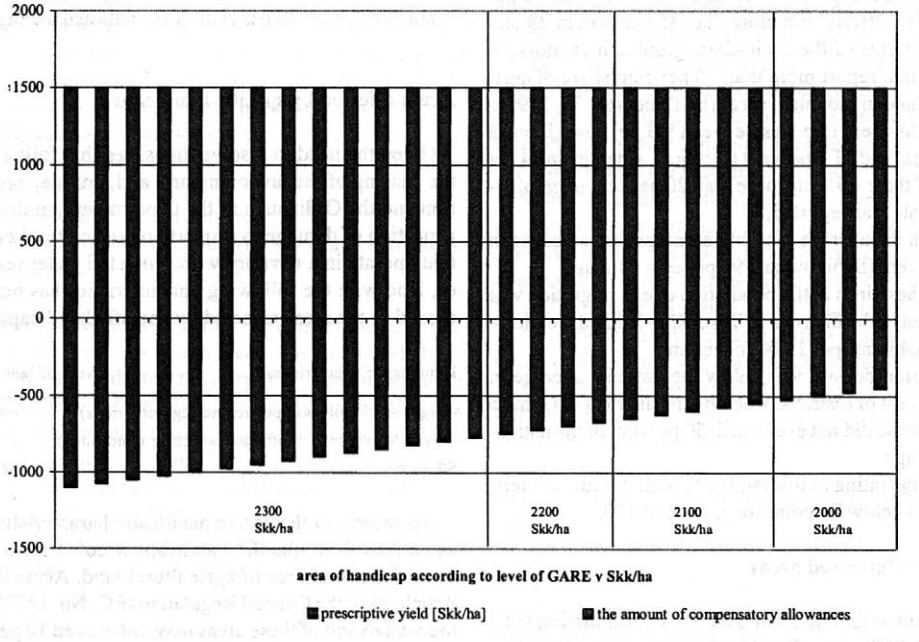

Figure 1. Proposal of compensatory allovances for mountain aresa

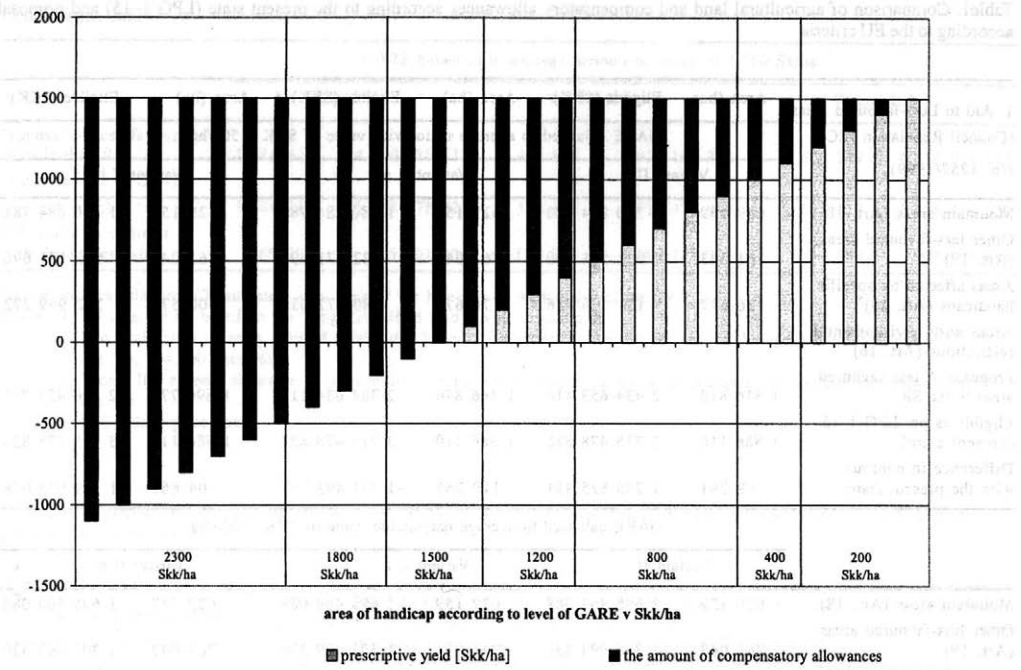

Figure 2. Proposal of compensatory allovances for other less-favoured areas

Other less-favoured areas – differentiated compensation for farming on less-productive land

Handicap characteristics: (GARE rating)	Compensation in SKK/ha	Eligible in mill. SKK
0–13.0	2,300	183
13.1–17.0	1,800	209
17.1–21.0	1,500	206
21.1–25.5	1,200	165
25.6–30.0	800	96
30.1–33.5	500	49
33.6– 7.0	200	15
SR in total		923

Areas affected by specific handicaps - compensation of increased costs related to the specific handicaps of the respective area, or low income compensation

Handicap characteristics:	Compensation in SKK/ha	Eligible in mill. SKK
– light sand soils (without restricting conditions)	900	62
– very heavy soils (without restricting conditions)	1,200	69
SR in total		131

Compensation is proposed per hectare of agricultural land included in the less-favoured areas upon meeting the determining conditions set forth in Article 14. Assistance is rendered to natural or legal persons which undertake to apply the appropriate farming practices compatible with the need to safeguard the environment and observe the intensity of the breeding of farm animals.

The total sum of compensatory allowances in the stage of model testing of the agricultural land classification ranges between SKK 2.4 and 4.3 billion (Tables 1 and 2), and the amount will be contingent on the availability of the state budget funds and economic performance of the SR at a certain time period, or time of its accession to the EU.

CONCLUSION

Pursuant to the Council Regulation (EC) No. 1257/1999, approximately 1,517 thousand to 1,691 thousand hectares of agricultural land of the SR (between 62 and 69 per cent) comply with the EU criteria on the classification of agricultural land into less-favoured areas, which is 69 to 105,000 hectares less as compared to the present state to which a compensation for farming under less-favourable natural conditions is applicable.

With respect to regionalisation, more than 50 per cent of the districts farm on agricultural land with a very low productivity which has a very negative impact upon the socio-economic situation of the local inhabitants. For this reason, the restructuring and diversification of agricultural production in less-favoured areas is a priority, and only by implementing these measures, the socio-eco-

Table1. Comparison of agricultural land and compensatory allowances according to the present state (LPG 1–15) and proposal according to the EU criteria

1. Aid to Less-favoured areas (Council Regulation (EC) No. 1257/1999)	Area (ha)	Eligible (SKK)	Area (ha)	Eligible (SKK)	Area (ha)	Eligible (SKK)
	GARE balanced to average nationwide value of SKK 1 500/ha					
	Variant II		Variant II a		Variant II b	
Mountain areas (Art. 18)	629 159	1 380 884 788	629 159	1 380 884 788	629 159	1 380 884 788
Other less-favoured areas (Art. 19)	761 043	922 571 690	761 043	922 571 690	761 043	922 571 690
Areas affected by specific handicaps (Art. 20)[2]	126 617	131 196 936	76 675	80 577 633	300 577	252 969 272
Areas with environmental restrictions (Art. 16)						
Proposal of less-favoured areas in the SR	1 516 818	2 434 653 414	1 466 876	2 384 034 111	1 690 779	2 556 425 750
Eligible as per LPG 1–15 (present state)	1 586 110	3 715 478 828	1 586 110	3 715 478 828	1 586 110	3 715 478 828
Difference in contrast with the present state	–69 291	–1 280 825 414	–119 265	–1 331 492 717	104 669	–1 159 053 078
	GARE balanced to average nationwide value of SKK 2 000/ha					
	Variant II		Variant II a		Variant II b	
Mountain areas (Art. 18)	629 159	1 695 464 088	629 159	1 695 464 088	629 159	1 695 464 088
Other less-favoured areas (Art. 19)	761 043	1 303 093 330	761 011	1 303 029 330	761 043	1 303 093 330
Areas affected by specific handicaps (Art. 20)[2]	126 617	143 858 590	76 675	88 245 088	300 577	283 026 974
Areas with environmental restrictions (Art. 16)						
Proposal of less-favoured areas in the SR	1 516 818	3 142 416 008	1 466 844	3 086 738 506	1 690 779	3 281 584 392
Eligible as per LPG 1–15 (present state)	1 586 110	3 715 478 828	1 586 110	3 715 478 828	1 586 110	3 715 478 828
Difference in contrast with the present state	–69 291	–573 062 820	–119 265	–628 740 322	104 669	–433 894 436
	GARE balanced to average nationwide value of SKK 2 500/ha					
	Variant II		Variant II a		Variant II b	
Mountain areas (Art. 18)	629 159	2 010 043 388	629 159	2 010 043 388	629 159	2 010 043 388
Other less-favoured areas (Art. 19)	761 043	1 683 614 970	761 011	1 683 534 970	761 043	1 683 614 970
Areas affected by specific handicapts (Art. 20)[2]	126 617	156 520 244	76 675	95 912 543	300 577	313 084 676
Areas with environmental restrictions (Art. 16)						
Proposal of less-favoured areas in the SR	1 516 818	3 850 178 602	1 466 844	3 789 490 901	1 690 779	4 006 743 034
Eligible as per LPG 1-15 (present state)	1 586 110	3 715 478 828	1 586 110	3 715 478 828	1 586 110	3 715 478 828
Difference in contrast with the present state	–69 291	134 699 774	–119 265	74 012 073	104 669	291 264 206
	GARE balanced to average nationwide value of 2 700 Sk/ha					
	Variant II		Variant II a		Variant II b	
Mountain areas (Art. 18)	629 159	2 135 875 108	629 159	2 135 875 108	629 159	2 135 875 108
Other less-favoured areas (Art. 19)	761 043	1 835 823 626	761 011	1 835 737 226	761 043	1 835 823 626
Areas affected by specific handicapts (Art. 20)[2]	126 617	169 181 898	76 675	103 579 998	300 577	343 142 378
Areas with environmental restrictions (Art. 16)						

Continuation Table 1

	GARE balanced to average nationwide value of 2 700 Sk/ha					
	Variant II		Variant II a		Variant II b	
Proposal of less-favoured areas in the SR	1 516 818	4 140 880 632	1 466 844	4 075 192 332	1 690 779	4 314 841 112
Eligible as per LPG 1-15 (present state)	1 586 110	3 715 478 828	1 586 110	3 715 478 828	1 586 110	3 715 478 828
Difference in contrast with the present state	–69 291	425 401 804	–119 265	359 713 504	104 669	599 362 284

Source: own calculations, Classification data bank of the Ministry of Agriculture of the SR

Notes: 1. All data are set based on the 7-digit classified land environmental unit
2. The total extent of areas referred to in Art. 12, and 20, may not exceed 10 per cent of the agricultural land of the SR (Art. 21), i.e. 244,000 hectares
3. Variant II b exceeds allowable 10 per cent limit of agricultural land in the SR in areas affected by specific handicaps according to Art. 20
4. LPG – land price group

Table 2. Comparison of agricultural land and compensatory allowances according to the present state (LPG 1–15) and proposal according to the EU criteria

1. Aid to Less-favoured areas (Council Regulation (EC) No. 1257/1999)	Area (ha)	Eligible (SKK)	Area (ha)	Eligible (SKK)	Area (ha)	Eligible (SKK)
	GARE balanced to average nationwide value of SKK 2 400/ha					
	Variant II		Variant II a		Variant II b	
Mountain areas (Art. 18)	629 159	1 947 127 528	629 159	1 947 127 528	629 159	1 947 127 528
Other less-favoured areas (Art. 19)	761 043	1 607 510 642	761 011	1 607 433 842	761 043	1 607 510 642
Areas affected by specific handicaps (Art. 20)[2]	126 617	156 520 244	76 675	95 912 543	300 577	313 084 676
Areas with environmental restrictions (Art. 16)						
Proposal of less-favoured areas in the SR	1 516 818	3 711 158 414	1 466 844	3 650 473 913	1 690 779	3 867 722 846
Eligible as per LPG 1–15 (present state)	1 586 110	3 715 478 828	1 586 110	3 715 478 828	1 586 110	3 715 478 828
Difference in contrast with the present state	–69 291	–4 320 414	–119 265	–65 004 915	104 669	152 244 018
	GARE balanced to average nationwide value of SKK 2 600/ha					
	Variant II		Variant II a		Variant II b	
Mountain areas (Art. 18)	629 159	2 072 959 248	629 159	2 072 959 248	629 159	2 072 959 248
Other less-favoured areas (Art. 19)	761 043	1 759 719 298	761 011	1 759 636 098	761 043	1 759 719 298
Areas affected by specific handicaps (Art. 20)[2]	126 617	169 181 898	76 675	103 579 998	300 577	343 142 378
Areas with environmental restrictions (Art. 16)						
Proposal of less-favoured areas in the SR	1 516 818	4 001 860 444	1 466 844	3 936 175 344	1 690 779	4 175 820 924
Eligible as per LPG 1–15 (present state)	1 586 110	3 715 478 828	1 586 110	3 715 478 828	1 586 110	3 715 478 828
Difference in contrast with the present state	–69 291	286 381 616	–119 265	220 696 516	104 669	460 342 096

Source: own calculations, Classification data bank of the Ministry of Agriculture of the SR

Notes: 1. All data are set based on the 7-digit classified land environmental unit
2. The total extent of areas referred to in Art. 12, and 20, may not exceed 10 per cent of the agricultural land of the SR (Art. 21), i.e. 244,000 hectares
3. Variant II b exceeds allowable 10 per cent limit of agricultural land in the SR in areas affected by specific handicaps according to Art. 20
4. LPG – land price group

nomic situation can be improved along with the habitation stabilisation and landscape conservation in these regions. In the EU pre-accession stage, the task of the SR is to continue seeking a balance between maintaining the original support system to agriculture and the European agricultural model focused on multi-functional agriculture and rural development.

REFERENCES

Fitz M. (1999): Indikatívne ukazovatele pre rozvoj vidieka a poľnohospodárskych štruktúr. Realizačný výstup, Bratislava, VÚEPP, 9 s.

Fitz M., Buday Š., Molčanová J. (2000): Overovanie klasifikácie poľnohospodárskej pôdy pre účely uplatnenia nástrojov regionálnej poľnohospodárskej politiky. Výskumná správa, Bratislava, VÚEPP, 18 s.

Agenda 2000 (1999): European Commission, Strassburg/ Brussels, 25 p.

Council Regulation (EC) No. 1257/1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF).

Official Journal of the European Communities L 160/113.

Council Regulation (EC) No. 1260/1999 that sets forth general conditions of structural funds.

Official Journal of the European Communities L 161/1.

Official Journal XXXI (1999). Part 11, Bratislava, Ministry of Agriculture of the SR.

Selected regional data (1998, 1999). Bratislava, Statistics Office of the SR.

Arrived on 21st June 2001

Contact address:

Miron Fitz, M.Sc., Výskumný ústav ekonomiky poľnohospodárstva a potravinárstva Bratislava, pracovisko Košice, Svätoplukova 36, 40 000 Košice, Slovenská republika
tel.: +421 55 63 34 937, fax: +421 55 63 34 936, e-mail: fitz@ke.sanet.sk

Soil productivity potential and cropping profitability in Slovakia

Produkčný potenciál pôd a rentabilita pestovania plodín na Slovensku

J. VILČEK

Soil Science and Conservation Research Institute, Bratislava, Slovak Republic

Abstract: Based on yield data of 281 agricultural subjects of the Slovak Republic in period 1990-1998, by the help of non-linear polynomic regression analyses, the yield dependence on soil productivity potential was determined in the paper. Highly evident yield and soil productivity potential was confirmed. The highest dependence for the balanced 265 data set was shown for winter wheat (r = 0,634) and spring barley (r = 0,617). Relatively lowest (although statistically high evident) is the dependence for potatoes and ensilage maize. By the soil units aggregation into proper categories, there were expressed yields of main agricultural crops (winter wheat, winter rye, spring barley, maize, pea, rape, potatoes, sugar beet, silage maize and perennial fodder crops). Their dependence not only on soil types, farmland typological-productivity categories, climatic region, sloping and soil erosion risk, was expressed. The results prove instructively that the highest productivity potential by soil type in Slovakia belongs to Chernozems followed by Phaeozems, Orthic Luvisols, Fluvisols, Regosols, Luvisols, Pseudogleys, Cambisols and finally Rendzinas. By knowledge of real productivity assumptions, actual productivity potential for a concrete location (with known proper soil characteristics) can be derived. The heterogeneity of the yield-forming potential of our soils is demonstrated on the crop production economical parameters differentiation. Without governmental subsidies, approximately 60% soils are not profitable for maize and sugar beet, respectively. Regarding potatoes, it is almost 75%. Generally, it can be stated for the crop production, that without subsidies there are in Slovakia, at the present economical situation, 54.4% soils not profitable, 13.9% of low profitability, 7.3% medium profitable, 10.6% highly profitable and 13.8% very highly profitable.

Key words: soil productivity potential, soil parameters, soil point values

Abstrakt: Na základe údajov o úrodách a ekonomických ukazovateľoch (náklady, výnosy) pestovaných plodín od 281 poľnohospodárskych subjektov za roky 1990 až 1998 sme pomocou nelineárnych polynomických regresných analýz stanovili závislosť týchto parametrov na produkčnom potenciály pôd. Korelačné závislosti boli vyjadrené regresnými rovnicami, ktoré umožnili každej pôde (pôdnej jednotke) na základe jej potenciálu vyjadreného v 100 bodovej škále priradiť pre tú, ktorú plodinu jej prislúchajúci úrodotvorný parameter. Polynomická regresná závislosť potvrdila vysoko preukaznú koreláciu úrod a produkčnej schopnosti pôd. Najvyššiu závislosť (r = 0,634) pri hodnotenom súbore 265 údajov vykazuje pšenica ozimná (0,634) a jačmeň jarný (0,617). Relatívne najnižšia, aj keď štatisticky vysoko významná je táto závislosť u zemiakov a kukurici na siláž. Agregáciou pôdnych jednotiek do príslušných kategórii sme vyjadrili závislosť úrod pšenice ozimnej, raže ozimnej, jarného jačmeňa, kukurice na zrno, hrachu siateho, repky ozimnej, zemiakov, cukrovej repy, kukurice na siláž a viacročných krmovín nielen od pôdnych typov ale aj od typologicko-produkčných kategórii poľnohospodárskych pôd. Výsledky dokazujú, že najvyšší úrodotvorný potenciál podľa pôdnych typov na Slovensku majú černozeme, nasledujú čiernice, hnedozeme, fluvizeme, regozeme, luvizeme, pseudogleje, kambizeme a rendziny. Rôznorodý úrodotvorný potenciál našich pôd sa prejavuje na diferenciácii ekonomických parametrov rastlinnej výroby. Bez dotácii štátu je asi 60 % pôd pre pestovanie kukurice na zrno a cukrovej repy nerantabilných. Pri zemiakoch je to až takmer 75 %. Všeobecne za celú rastlinnú výrobu môžeme konštatovať, že bez dotácií je pre pestovanie rastlín na Slovensku pri súčasných ekonomických pravidlách 54,4 % pôd nerentabilných, 13,9 % málo rentabilných, 7,3 % stredne rentabilných, 10,6 % vysoko rentabilných a 13,8 % pôd veľmi vysoko rentabilných. Účelová rajonizácia pestovania plodín by preto mala zohrávať jednu z rozhodujúcich úloh pri plánovaní výroby na pôde. Poznaním reálnych produkčných i ekonomických predpokladov, ktoré sme sa v tomto príspevku snažili prezentovať je možné pre konkrétnu lokalitu, o ktorej sú známe príslušné pôdne charakteristiky, odvodiť jej potenciálne možný úrodotvorný i ekonomický potenciál.

Kľúčové slová: úrodotvorný potenciál pôd, pôdne parametre, rentabilita pestovania plodín

INTRODUCTION

The manner of rural countryside use is/will be considerably influenced by the soil productivity potential. It is logical, that even at a very good structure of soil productivity potential use, there will still be dominant yield and economical results differentiation depending on the heterogeneity of conditions and on concrete soil. Soil quality relationship to the relevant crop production used to be expressed by the fertility or soil productivity po-

tential. Soil quality relationship to economic parameters reached can be assessed based on profitability (economical suitability) of the given crop.

Several authors were dealing with the relationship yield – soil in past. Hraško (1983) mentioned, that soil grouping and zoning by their suitability for the concrete crops and , corresponding to it, the elaboration of rational structure of the cropped areas, is one of the most important conditions of the arable land productive capability increase and of reaching high stable yields. Džatko et al. (1979) stressed, that the genetic soil types productive capability is influenced also by climatic and orographic conditions; their effect used to be more marked than the differences among two or three genetic soil types in the same climatic, natural conditions.

Today, there is a shortage of such works – concentrated on soil grouping by their suitability for the crops, and in case they are available, the solution is only from the qualitative position, whereby it is stated, whether the soil is suitable or not. Only rarely there is defined the suitability rate or degree (Džatko 1981, 1985; Džatko, Vilček 1993; Klečka, Korbíni 1975; Vilček 1999; Hronec 2000) and economic characteristics are almost totally absent.

This paper content and target is the yield testing of crops in relationship to soil quality, determination of soil properties, selected for soil productivity potential differentiation and soil categorization from the view of the given crops profitability.

MATERIAL AND METHODS

With the aim of the targets fulfilling , we were issuing from the following data:

- the Soil Science and Conservation Research Institute database – the System of Bonited Pedo-Ecological Units (BPEJ) and their point assessment on the 100-point basis (Džatko 1979);
- the typological production farmland categorization (Džatko, Dubovcová 1985; Džatko, Vilček 1993), soil categorization by erosion risk (Jambor, Ilavská 1998), and bonity soil parameters categorization (Linkeš, Pestún, Džatko 1996);
- really reached yields of main crops (winter wheat, winter rye, spring barley, maize, peas, winter rape, potatoes, sugar beat, silage maize and perennial fodder crops);
- really attained economic parameters (revenues, profits, cost) of the main crops and crop production in total.

The concrete yield data and crop production economics data were directly from agricultural enterprises obtained for the period 1990 to 1998. We have balanced data obtained from 281 agricultural subjects farming in heterogeneous natural conditions, totally on the area of 556 thous. ha farmland, i.e. 23% of the total farmland of Slovakia.

The indices studied the dependence on soil production capability of the farms expressed by the mean point BPEJ evaluation in 100-point scale, tested by the nonlinear polynomic regression analysis. Based on this dependence, we have determined regression equations for every crop, by the help of them every BPEJ yield potential option was coordinated as well as its potential economical parameters (profits, costs, yield or loss). Profitability rate was calculated in % as the ratio profit/costs. By the help of software filters for the soil representatives soil parameters and categories, real possible mean yields and predicted profitability rate were subsequently calculated. By the means of the Geographic Information System (GIS) ARC INFO were differentiated on the background of vector bonity maps and the potential profitability rate of crop production and selected crops in Slovakia quantified in the scale 1 : 5 000 .

RESULTS AND DISCUSSION

Crop production level is most often expressed by the attained per hectare yields. This indicator is affected by many factors. The main yield-creating factor is introduced by the a location of the pedo-climatic conditions. The yield-forming process is multi-depending on the human factor, in this work, however, there is only expressed the relationship of soil point value or value of selected parameters to the main crops per hectare yields.

The relatively considerable yield database of balanced enterprises enabled us to determine their dependence on soil productivity potential (expressed by point-value). Polynomic regression dependence confirmed the highly significant yield correlation with soil productivity potential. The most close dependence in the assessed set of 265 data was calculated for wheat ($r = 0.634$), and spring barley ($r = 0.617$). Relatively the lowest (though statistically high significant) dependence was demonstrated for potatoes and silage maize. The regression dependencies calculated were in further step used for determination of the potentially optional yields of the crops for the soil point scale, and based on it also for each of the Bonited Pedo-Eecological Units (BPEJ). Instructively, there was confirmed and concretized the fact, that the yield level is depending from soil quality to a large extent.

In this way, it is possible to derive the some of the really possible soil productivity parameters (BPEJ) for the concrete crop. Real yield values on the level of the Main Soil Units (HPJ) were published by Vilček (1999), and on the level of the BPEJ, they are to our disposal in the Soil Science and Conservation Research Institute database in Bratislava.

By the BPEJs cummulation by the required parameters, it was subsequently possible to determine the analysed crops predicted yields. In this way, there were determined the potential production assumptions for farmland by soil types, typological-production categories of arable land, sloping, climatic region and erosion risk category.

The results show instructively, that the highest yield-forming potential is consecutively typical for Chernozems – Mollic Fluvisols – Orthic Luvisols – Fluvisols – Regosols – Luvisols – Pseudogleys – Cambisols – Rendzinas.

The concrete yield values by the soil types for the given crop set are presented in Table 1.

The presupposed per hectare yield differentiation in dependence on the typological-production soil category is highlighted in Table 2. For example there is presented, that on the most productive Slovakian soils, 1 ha could produce up to 5.78 t wheat, while the low productive soil only 3.88 t, i.e. here is more than 32% production decrease. Also from this view it can be furthermore stated, that if the present economical profitability rate is at wheat yields above 4 t/ha, one of the decisive aspects of the cropping structure decision is just soil production capability.

Our soils yield-forming potential analysis in various climatic regions of Slovakia is confirming and concretizing the assumptions of soil productivity potential decrease in the direction towards the less productive climatic conditions. Yield decrease is an objective reality that should be considered at crop zoning and crop production structure as a whole. E.g. at winter wheat, there is an assumption of yield decrease in the least beneficial climatic region 1.7 t/ha, i.e. 32%, when compared to the best region.

Table 1. Potential production assumptions for soil types (t/ha)

Crop	Chernozem	Phaeozem	Fluvisol	Orthic luvisol	Regosol	Albic luvisol	Pseudogley	Cambisol	Rendzina
Winter wheat	5.45	5.22	4.87	4.88	4.66	4.43	4.15	4.08	3.90
Winter rye	4.05	3.91	3.73	3.73	3.62	3.51	3.38	3.35	3.28
Spring barley	4.64	4.41	4.09	4.09	3.92	3.70	3.48	3.43	3.29
Maize	4.84	4.55	4.27	3.99	4.10	3.71	3.54	3.51	3.45
Peas	2.72	2.52	2.27	2.27	2.16	1.99	1.85	1.82	1.73
Winter rape	2.64	2.53	2.36	2.37	2.24	2.13	1.97	1.93	1.82
Potatoes	16.38	14.93	13.51	13.35	13.19	12.32	12.06	12.10	12.08
Sugar beet	33.58	33.32	32.71	31.88	31.62	29.59	27.59	26.90	25.72
Ensilage maize	28.05	26.30	24.51	24.34	24.00	22.88	22.39	22.39	22.23
Perennial fodder crops	8.72	7.94	7.15	7.07	6.93	6.44	6.23	6.23	6.17

Table 2. Potential production assumptions for soil typological–productivity categories (t/ha)

Crop	Typological–productivity categories of soils									
	O1	O2	O3	O4	O5	O6	O7	OT1	OT2	OT3
Winter wheat	5.78	5.62	5.28	4.87	4.55	4.23	3.88	4.32	4.03	3.76
Winter rye	4.36	4.16	3.94	3.72	3.56	3.42	3.27	3.46	3.33	3.22
Spring barley	4.98	4.81	4.46	4.08	3.80	3.54	3.27	3.62	3.39	3.18
Maize	5.35	5.02	4.44	3.92	3.62	3.52	–	–	–	–
Peas	3.03	2.87	2.56	2.26	2.06	1.88	1.72	1.93	1.78	1.67
Winter rape	2.78	2.72	2.57	2.36	2.19	2.01	1.81	2.07	1.90	1.74
Potatoes	18.76	17.43	15.10	13.33	12.49	12.05	12.03	12.18	12.01	12.13
Sugar beet	33.43	33.71	33.43	31.40	28.43	26.52	–	–	–	–
Ensilage maize	30.87	29.31	26.53	24.31	23.15	22.44	22.16	22.65	22.26	22.18
Perennial fodder crops	9.98	9.28	8.04	7.06	6.55	6.24	6.14	6.34	6.17	6.15

O1 – most productive arable soils
O2 – high productive arable soils
O3 – very productive arable soils
O4 – productive arable soils
O5 – medium productive arable soils
O6 – less productive arable soils
O7 – low productive arable soils
OT1 – medium productive arable soils and very productive grassland
OT2 – medium productive arable soils and medium productive grassland
OT3 – low productive arable soils and less productive grassland

Table 3. Soils share from economic profitability view point of cultivated plants in %

Profitability category	Winter wheat	Maize	Sugar beet	Winter rape	Potatoes	Crop production total
Soil non profitable	36.3	59.5	61.0	31.3	74.9	54.4
Soil low profitable	15.8	3.1	1.3	31.2	4.9	13.9
Soil medium profitable	13.7	12.9	3.4	17.3	6.1	7.3
Soil high profitable	21.4	15.4	22.4	13.6	9.3	10.6
Soil very high profitable	12.8	9.1	11.9	6.6	4.8	13.8

Soil productivity potential decrease takes place also under the influence of arable land sloping increase. Terrain configuration also plays an important role. Objectively worse production conditions occur at the more complicated and sloping arable land. E.g. at winter wheat, there is typical the fact that with sloping increase of 1°, per hectare yield is reduced approximately by 0.15 t/ha.

With sloping, there are narrowly connected the processes of water erosion that have been resulting in the annual runoff of the most fertile soil particles at more than 55% of the farmland area. This negatively influences soil productivity and the resulting economic parameters . From our calculations, there is resulting a rapid yield reduction, particularly between the category of land without erosion and moderately or weakly eroded soils (for winter wheat, this is approximately 17%). Among other erosion categories (severely and extremely eroded soils), these differences are not so sharp.

It is logical, that the heterogeneous yield-forming potential of our soils is, as a rule, demonstrated in the crop production economic parameters differentiation. From this view, surely it is interesting to consider the farmland presentation with respect to the economic profitability of the crops grown (Table 3). Based on our calculation, it is revealed that without any governmental subsidies, approximately 60% soils are not profitable for maize and sugar beet, respectively. For potatoes, this is almost 75%.

Generally, it can be stated for all the crop production, that without subsidies, 54.4% soils are not profitable in the conditions of the present economic situation in Slovakia, 13.9% are of low profitability, 7.3% medium profitable, 10.6% highly profitable and 13.8% soils very highly profitable.

CONCLUSIONS

The data obtained confirm, that one of the causes of different yields is the heterogeneity of soils and their characteristics. This phenomenon should therefore play a decisive role at the farming planning. By knowledge of the production presuppositions, presented in this paper, it is possible to derive the potentially optimum soil yield-forming potential for the concrete site (with known soil characteristics).

REFERENCES

Džatko M. (1979): Kategorizácia PEJ z hľadiska pestovateľských prostriedkov pre hlavné plodiny. VÚPVR, Bratislava, 43 s.

Džatko M. a kol.(1981): Hodnotenie agroekosystémov pre účely špecializácie rastlinnej výroby a usporiadania pôdneho fondu. VÚPVR, Bratislava, 37 s.

Džatko M., Dubovcová M. (1985): Hodnotenie vhodnosti pôdno-ekologických podmienok pre pestovanie poľnohospodárskych plodín a kultúr. VÚPVR Bratislava, 32 s.

Džatko M., Vilček J. (1993): Efektívnosť využívania krajiny a reštrukturalizácia rastlinnej výroby. VÚPÚ, Bratislava, 21 s.

Hraško J. (1983): Princípy hodnotenia pedosféry. VÚPVR, Bratislava, 44 s.

Hronec O. a kol. (2000): Prírodné zdroje. Royal Unicorn, Košice, 235 s.

Jambor P., Ilavská B. (1998): Metodika protierózneho obrábania pôdy. VÚPÚ, Bratislava, 69 s.

Klečka M., Korbíni J. (1975): Ekonomická charakteristika přírodních oblastí ČSR a SSR. VÚEZV, Praha-Bratislava, 130 s.

Linkeš V., Pestún V., Džatko M. (1996): Príručka pre používanie máp bonitovaných pôdno-ekologických jednotiek. VÚPÚ, Bratislava, 103 s.

Vilček J. a kol. (1999): Pôdnoekologické parametre usporiadania a využívania poľnohospodárskej krajiny. VÚPOP, Bratislava, 113 s.

Arrived on 12th April 2001

Contact address:

Ing. Jozef Vilček, PhD., Výskumný ústav pôdoznalstva a ochrany pôdy Bratislava, regionálne pracovisko Prešov, Reimanova 1, 080 01 Prešov, Slovenská republika
e-mail: vilcek@vupop.sk

The results of the monitoring of the rural regions socio-economic problems and their impact upon the economics of agricultural enterprises

Výsledky monitorovania sociálno-ekonomických problémov vidieka a ich vplyv na ekonomiku podnikov

Ľ. SRNKOVÁ

Research Institute of Agricultural and Food Economics, Bratislava, Slovak Republic

Abstract: The paper focuses on one particular part of the research task entitled the Results of the Monitoring of the Structural Changes in Agriculture and the Socio-economic Problems of Rural Regions, namely that which deals with the regional analysis in the context of the population structure, labour market situation, business activity in the selected districts, and the comparison of the economic results of agricultural enterprises operating in these districts with an overall development level of these rural regions. On the one hand, there are structurally weak regions, with a high employment rate in the agri-sector and an overall high rate of unemployment, with the majority of population living in rural communities; on the other hand, there are regions with a high population density, with employment predominating in the industrial sector, whereby business activity, earnings and unemployment insurance payments are much higher.

Key words: backward rural regions, developed rural regions, the labour market, demography, population structure, socio-economic standard, economics of agricultural enterprises

Abstract: Predmetom príspevku je časť výskumnej úlohy „Výsledky monitorovania štrukturálnych zmien v poľnohospodárstve a sociálnoekonomických problémov vidieka", ktorá sa zaoberá regionálnou analýzou z hľadiska zloženia obyvateľstva, situácie na trhu práce, podnikateľskej aktivity vo vybraných okresoch a porovnaním ekonomických výsledkov poľnohospodárskych podnikov v nich hospodáriach s celkovou úrovňou rozvoja týchto vidieckych regiónov. Na jednej strane sú tu štrukturálne slabé regióny s vysokou agrárnou zamestnanosťou a vysokou mierou nezamestnanosti, ktorých väčšina obyvateľstva žije vo vidieckych obciach a na druhej strane regióny s vysokou hustotou osídlenia, kde prevažuje zamestnanosť v priemyselných odvetviach a podnikateľská aktivita, cena práce ako aj platby na poistenie v nezamestnanosti sú o mnoho vyššie.

Kľúčové slová: zaostávajúce vidiecke regióny, rozvojové vidiecke regióny, trh práce, zloženie obyvateľstva, sociálno-ekonomická úroveň, ekonomika poľnohospodárskych podnikov

INTRODUCTION

Most frequently, a statistical criterion is used to characterise rural regions according to which a rural community is a community having up to a certain number of inhabitants. In Slovakia, given the size structure of communities, this limit has been set to 5,000 inhabitants which also corresponds with a legal criterion, as the status of a town is largely enjoyed by communities exceeding this limit. In 1999, of the 883 communities in the Slovak Republic (including 4 military districts), 134 towns were reported. 43 per cent of the country's population live in 2,749 rural communities. According to the latest OECD and EUROSTAST methodologies, for the purposes of international comparison, rural regions are defined as a group of communities with population density less than 100 inhabitants per square km. In Slovakia, 2,230 communities fall under this category, which is 77 per cent of all the communities. 30 per cent of the total population live in communities with a low population density.

METHODOLOGY

Ideally, the quantification of the existing socio-economic changes should be conducted in as small a territorial unit as possible, i.e. the territory of a community. However, the accuracy and relevance of the mandatory reported statistical data deteriorate with the diminishing size of the basic territorial unit. Based on the official demographic and regional statistics of the Statistics Office of the SR which is available at the lowest, i.e. district level, the socio-economic situation in 70 rural districts (except for Bratislava and Košice and their city parts) is monitored.

As of 1997, we have been monitoring the number of communities and the size of the population of rural communities, population density, population status in total and by sexes, the population attrition rate, age structure, average age and the ageing index, economically active population, total employment and employment by economic activities, unemployment rate, employment in the agri-sector, earnings of workers, production of marketable goods and services in industry, building, and agriculture, business activity, unemployment insurance payments. The output of the monitoring of socio-economic data is a regional analysis vis-à-vis the labour market, economic prosperity, and the population structure.

A selection of backward (B group) and developed (A group) districts/regions was carried out, using dependable indicators of the rural nature of a region, such as the proportion of the population that lives in rural regions, population density, employment in the agrisector, and unemployment rate. Using the MS Excel filter into which four criteria were input, i.e. population density less than 100 inhabitants per sq.km, average unemployment rate higher than 11 per cent, employment in the agrisector higher or equal to 10 per cent, and the proportion of inhabitants living in rural communities higher than 50 per cent, of the 70 districts in Slovakia, 6 were selected. Similarly, by using these four criteria, however, with an opposite sign of unequality, additional 9 districts were selected (ref. to Table 1). In these sample groups, the assumption of the correlation between the results of the operation of the enterprises in primary agricultural production and the socio-economic situation in rural regions was exposed to a scrutiny.

RESULTS AND DISCUSSION

Population status and migration

By late 1999, the SR had a population of 5, 398.7 thousand, of which 2,625.1 thousand were males. There were 946 males per 1,000 females. In contrast with 1998, a moderate increase in the population was reported, i.e. by 5.3 thousand persons.

Of the total population growth in 1999, 23 per cent were to be attributed to migration and 77 per cent to natural increase. The slowing-down of the population reproduction, when a slowed-down death rate could not offset a decline in the birth rate, also continued throughout 1999. This resulted in a further drop of the natural population growth which is steadily nearing zero. The highest natural approaching per 1,000 inhabitants between the years 1997–1999 was reported in 19 districts of northern and

Table 1. Selected Groups of Rural Regions

Backward – B group:

District	Population density	Unemployment rate	Average unemployment rate	Share of employees in agriculture	Proportion of rural population
Levice	78.1	17.4	19.5	10.8	52.5
Turčianske Teplice	42.6	10.7	11.5	14.2	56.9
Krupina	39.4	16.5	18.6	15.9	58.4
Poltár	46.6	17.6	21.5	12.3	74.6
Veľký Krtíš	55.1	22.0	26.2	15.3	66.6
Sobrance	43.5	23.0	24.2	10.5	73.5

Developed – A group:

District	Population density	Unemployment rate	Average unemployment rate	Share of employees in agriculture	Proportion of rural population
Pezinok	143.0	5.0	5.8	4.9	35.3
Hlohovec	171.1	9.1	1.,0	6.4	38.3
Piešťany	168.0	6.7	7.6	6.4	42.2
Trnava	170.4	8.7	9.2	6.0	44.5
Ilava	173.8	6.6	6.8	2.7	29.0
Prievidza	147.4	8.7	9.8	3.3	42.1
Trenčín	168.6	4.2	4.8	4.7	38.5
Žilina	192.1	8.7	10.2	1.9	38.9
Banská Bystrica	139.6	5.3	6.5	2.4	24.9

Backward – Districts with a high share of employees in agriculture and a high rate of unemployment, low population density and a high share of rural population

Developed – Districts with a high population density, low unemployment rate, low employment in the agrisector and a low proportion of the population living in rural communities

*/ 1997 Statistical data of the Statistics Office of the SR

eastern Slovakia (with values between 2 and 10), which is also connected with a religiosity rate of the local population. On the contrary, the highest natural attrition rate was reported in the districts of Turčianske Teplice, Nové Zámky, Myjava, Sobrance, Krupina, Detva, and Komárno (more than –3) – these are districts with aged population. A rather poorly developed real estate market impedes a more intense internal migration. It should also be noted that while the most expensive flats are found in the regions with a lower unemployment rate, the comparatively most affordable housing stock is found in the districts reporting the highest unemployment rate.

Age structure

The process of the population ageing continues which is evidenced by a moderately increased life expectancy, the deterioration of reproduction rates and the population age structure. In 1999, the share of the pre-working age population dropped as opposed to 1998, and reported 19.8 per cent of the total population. In those two years, the number of young people fell in absolute terms by 32.5 thousand, which is a 3 per cent decline. In a cross-regional comparison, the highest share of the pre-working age population was reported in the districts of Námestovo, Kežmarok, Sabinov, and Stará Lubovňa (over 27 per cent). By late 1999, the working age population numbered 3,361.1 thousand. As opposed to 1998, the proportion of the working age population increased moderately to 62.3 per cent. A lower share of the working age population is reported in the backward rural regions. The highest share of the working age population (over 64 per cent) was reported in the districts of Banská Bystrica, Dunajská Streda, Pezinok, and Trnava. The share of the post-working age population increased to 17.9 per cent. This increase is to be attributed to females rather than males, as of the total increase of 8.7 thousand persons, females accounted for 87 per cent.

Due to a dwindling proportion of the population in the younger age groups and an increase in the number of persons in the post-working age group, the average population age continues to increase along with the ageing index. In 1999, the average age was 35.7 years, which is by 0.3 year more than in 1998. Overall, 39 districts reported figures above the national average. The highest average age was reported in the districts of Medzilaborce (38.6), Turčianske Teplice (38.2), and Myjava (38). In contrast with 1998, the ageing index deteriorated by 3.4 points, reaching 90.5. In other words, in 1999, an average of 90.5 persons in the post-working age per 100 inhabitants aged 0-14 were reported. A value above 100 per cent was reported by 25 districts, the highest figures were reported in Medzilaborce (138.6), followed by Turčianske Teplice, Myjava, Nové Mesto n/V, Sobrance, Nové Zámky, Poltár, Komárno, Piešťany, and Levice (112.2).

In terms of its age structure, Slovakia is among ten European countries with the youngest population, however, declining birth rates and an increase in the number of population aged 65 and over may allude to a fall to the bottom lines of the list. According to the OECD methodology, the population age structure is defined by the following index: number of inhabitants aged 15-19 per number of inhabitants aged 60-64. This indicator is to show to the extent the group of citizens reaching the working-age is capable of replacing a group of citizens leaving the working-age group. A more marked demographic pressure on the labour market in the years to come (the number of young people entering the labour market exceeds the number of persons in retirement age) is to be expected largely in the districts of Námestovo, Kežmarok, Tvrdošín, Stará Lubovňa, Sabinov, Spišská Nová Ves, Vranov nad Topľou, Levoča, Bardejov, Poprad, Dolný Kubín, Prešov, Čadca, Svidník, Humenné, in which the above proportion is more than 20 per cent above the national average.

There are significant differences in the demographic data of the selected groups. The population of backward regions lives mostly in small communities and reports a highly unfavourable age structure. In the group of backward regions, the ageing index expressing the share of the post-working age population in the pre-working age population reported 111.7 in contrast with 92.2 in the developed regions. The average age is also higher in the backward regions (37.4) than in the developed regions (35.8). The 1998 average population density per square kilometre was 164 in the group of developed regions, while in the group of backward regions, only 51. In terms of the size structure of rural communities, the group of backward rural regions is predominated by small communities with population up to 500 (65 per cent), while in the developed regions, these communities report 24 per cent share.

Unemployment

As of December 31, 1999, 2,662 thousand economically active inhabitants were reported in the SR. In contrast with an identical period in 1998, the number of economically active population increased by 2 per cent (55.5 thousand persons). However, this increase in the number of the economically active population was largely reflected upon the number of unemployed persons.

By late 1999, in contrast with the year before, the number of unemployed persons increased by 107,000, i.e. by 25 per cent, and exceeded 535,000 in total. The average length of keeping the unemployed in the labour office files was 14.4 months. The number of persons unemployed long-term exceeded 230,000, which is a year-on-year increase by over 40 per cent. The period of keeping the unemployed in the labour office files continues to extend. The average time of keeping the unemployed in the labour office records increased from 11.6 months in 1998 to 14.2 months in 1999.

In 1999, the unemployment rate of the available number of unemployed persons in Slovakia was 19.2 per cent. In as many as 41 districts, unemployment rate was report-

ed to be higher than the above average. In northern and western Slovakia, unemployment rate was higher than the national average in more than one third of the districts, in central Slovakia, in over three quarters of the districts, and in eastern Slovakia, practically all the districts reported figures exceeding the national average. Among the reasons of the high unemployment rate, especially in the eastern part of the country, there are a high share of the Roma population, low education standard, underdeveloped infrastructure, marked shortage of industrial production, and a declining share of agricultural production. A high unemployment rate, including long-term unemployment, is mostly concentrated in the backward rural regions. Traditionally, the highest unemployment rate was reported in the districts of Rimavská Sobota (37 per cent). Very high, almost 30 per cent, unemployment is also reported in the districts of Veľký Krtíš, Revúca, and six East-Slovakian districts: Trebišov, Sobrance, Rožňava, Gelnica, Stropkov, and Vranov n/T. A single-digit unemployment rate is reported only in five rural regions, namely, Senec, Ilava, Trenčín, Banská Bystrica, and Pezinok. The inter-regional differences are effaced due to the deteriorating situation in the until recently economically most advanced regions with a lower unemployment rate.

The unemployment rate is also affected by the seasonality of some sectors, notably, agriculture, forestry, building, and tourism. The majority of employees hired for seasonal work in these sectors are kept in the labour office records. In 1999, according to the Sectoral Classification of Economic Activities (SCEA), the share of the unemployed in the agri-sector in the number of unemployed persons kept in the labour office files was 13.5 per cent. This average was exceeded by 33 districts, and in 30 of them, the total unemployment hit above-average figures. In the group of backward regions with a high employment in the agri-sector, the number of the unemployed in the agri-sector reports an above-average proportion of the unemployed (especially in Krupina and Veľký Krtíš districts, over 30 per cent).

Criminality, especially in young people, goes hand in hand with increasing unemployment. The fact that a high proportion of the inhabitants, oftentimes bread-winners, has no income from a wage-earning activity resulted in an increase in the number of households which are on the brink of poverty (by late 1999, more than one tenth of the total population had been dependent on social assistance). Insecurity, fear of being laid-off, hopelessness as a result of a repeated failure to find a job, bad financial situation in families are among the phenomena that accompany the lives of a great portion of the society.

The nature of the unemployment in the SR indicates that its solution goes outside the framework of measures, tools, and the labour market policy concepts which can only mitigate the most blatant regional disparities and the situation of the social groups at risk. It is obvious that in the foreseeable future, an overriding priority is the rehabilitation of the society through its economic growth, the outcome of which would be a positive change in the unemployment development.

Employment

Due to massive lay-offs, employment in the Slovak Republic continued to decline in 1999; in contrast with the year before, 51.5 thousand persons were given notice, i.e. 4 per cent of the employed. The most numerous group of the employed is composed of workers who, together with co-operative members, accounted for 93 per cent of the total employment. Entrepreneurs (owners of companies, small traders, sole proprietors, free-lancers) accounted for 295.7 thousand persons which is 11 per cent of the economically active population. As opposed to the year before, the number of entrepreneurs in the SR did not report any increase. In the employment structure by the sectors of the national economy, the highest employment proportion is maintained by industrial sectors, especially, industrial production (industry and building 35 per cent in total). In the regions of Bytča, Púchov, Myjava, Bánovce n/B., Ilava, Partizánske, industry reports the highest employment figures. The highest proportion of the employed is in the building industry, in the districts of Žilina and Liptovský Mikuláš. Agriculture accounts for 9 per cent share in the total employment. Of the total number of the employed across the individual districts, the highest proportion of the employed in the agri-sector is in the districts of Turčianske Teplice, Krupina, Sobrance, Košice-environs, Medzilaborce, Veľký Krtíš, and Poltár (over 25 per cent). In contrast with the year before, employment in the agri-sector dropped by 15.7 thousand persons. In industry, the number of the employed declined by 20 thousand persons; in the group of backward rural regions, a moderate increase in industry and building was recorded.

As regards the employment in agriculture, it is predominated by employee status and employees predominate in agricultural enterprises that have 20 and more employees. In 1999, 92,466 permanently active employees were recorded in agriculture which is 14 per cent less than in the year before. This decline is more apparent in the B group of regions predominated by agriculture than in A group – developed regions. The group of backward rural regions with a prevalently mono-structure economy (as much as 21 per cent of employees in agriculture and 27 per cent in the agri-sector overall) reports a particularly high unemployment rate. The 1999 share of the available unemployed was 27 per cent in the average. In contrast with the average for developed regions, this is more than a double. By its rate of the unemployment reduction, agriculture continues to be placed first which is due to an overall slump in the sector and also a greater pressure on the effective use of the employees and a higher incidence of seasonal work. In the group of backward regions, an increase in the number of employees in industry and building is apparent. In trading activity, the number of employees has risen in just the developed regions.

Production of market goods and services

According to the data of the Statistics Office of the SR, the 1999 income from the marketing of agricultural prod-

Table 2. Labour market

District	Economically active population	No. of the unemployed on records	Unemployment rate in available unemployed persons	Share of the unemployed, from agriculture (SCEA)	Average number of employees on records, total	of which %: agriculture	industry	building	trade
Pezinok	26 971	2 574	9.0	1.2	9 438	11.2	28.6	2.1	5.6
Hlohovec	22 806	3 535	14.9	5.4	11 442	9.9	47.7	3.8	3.9
Piešťany	31 145	3 630	10.8	5.9	16 120	10.7	26.6	6.8	3.7
Trnava	62 916	9 224	14.0	5.6	35 968	7.8	39.7	5.3	4.4
Ilava	31 420	2 743	7.9	5.1	17 072	4.5	53.3	2.9	6.0
Prievidza	72 312	11 283	14.8	7.3	39 806	4.2	55.4	5.5	4.3
Trenčín	55 636	4 565	7.7	6.1	32 714	7.2	38.4	4.3	5.1
Žilina	81 546	13 069	15.2	4.5	44 750	2.5	31.4	8.4	8.3
Banská Bystrica	54 989	5 513	9.3	6.8	35 534	3.9	27.0	4.7	7.0
A group	**48 860**	**6 237**	**12.1**	**7.7**	**26 983**	**5.8**	**38.7**	**5.4**	**5.7**
Levice	59 479	15 855	25.4	21.4	30 012	12.6	34.5	8.1	3.3
Turčianske Teplice	8 941	1 742	18.4	25.0	3 860	23.9	20.2	4.0	4.9
Krupina	12 686	3 028	23.4	36.1	5 154	25.0	19.9	4.2	6.2
Poltár	11 268	3 269	27.9	15.2	4 697	16.2	54.4	0.6	1.2
Veľký Krtíš	22 068	7 719	33.7	32.7	9 429	2.,2	33.2	1.7	3.3
Sobrance	10 910	3 758	32.9	25.4	3 121	2.,2	8.8	6.3	3.3
B group	**20 892**	**5 895**	**27.0**	**30.3**	**9 379**	**17.3**	**32.2**	**5.7**	**3.5**
SR, total	**2 662 356**	**535 211**	**19.2**	**13.5**	**1 355 280**	**8.0**	**33.2**	**4.9**	**5.4**

Source: 1999 regional comparisons in the SR, Statistics Office of the SR, 2000; National Labour Office

ucts of primary animal and crop production totalled SKK 34.68 billion, which is a very moderate increase as opposed to the year before. For the purposes of regional comparison, data on the gross agricultural production from gross turnover are available. While the agricultural rural regions, i.e. B group, report an average of 1.8 per cent share of the gross agricultural production in national production, in A group, it was 1.5 per cent in the average, with the animal production share predominating. In A group, the share of animal production exceeded the national average in all the districts, except for Piešťany and Hlohovec.

The results of the 1999 industrial production activity are goods in the value of SKK 578 billion which is 6 per cent less than in the year before. Based on the data on the goods production in industries, the districts of Trnava, Žilina, Prievidza, Žiar nad Hronom, Poprad, and Michalovce report a more than 2 per cent share in the nationwide production. On the opposite side of the list of industries, there are Medzilaborce, Sobrance, Svidník, Stropkov, Levoča, Poltár, Gelnica, Turčianske Teplice (0–0.1 per cent). In these structurally underdeveloped regions, the agri-sector remains to be almost the only source of the income of rural inhabitants. In building production totalling SKK 63.25 billion, a drop by 26 per cent was recorded compared to 1998. Of the individual regions, Žilina is placed first as regards building production, followed by Nitra (8 per cent, or, 4 per cent of the national production). Big differences among the selected groups of regions are reported in the production of market goods and services. Developed regions account for a seven times higher share of the production of market goods and services in industry and building as opposed to backward regions.

Price of labour

A statistically monitored price of labour indicator of the employees of companies having 20 and more employees provides a partial picture of the economic power of regions. The achieved level of the average monthly earnings and employment predetermine the standard of living of the group of the working-age population which ranges between 55 per cent (Sobrance) and 64 per cent (Dunajská Streda) of the population across the individual regions. In 1999, the average monthly earnings in all the enterprises and organisations of the national economy (except for small organisations with a headcount up to 19), totalled SKK 10,945. In five districts (Snina, Stará Ľubovňa, Svidník, Sobrance, Sabinov) it has not reached SKK 8,000. Higher earnings are concentrated in the developed regions. As opposed to backward regions, the average monthly earnings in developed rural regions were higher by SKK 1,900 in the average.

In 1999, the average monthly earnings of an employee in an agricultural enterprise that had 20 and more employ-

ees totalled SKK 8,458. In contrast with the year before, it was an increase by 7.2 per cent. Among the regions with the lowest earnings in agriculture (below SKK 7,000), there are Stará Lubovňa, Revúca, and Čadca. In contrast with other sectors of the economy, a drop in the earnings in agriculture was started in 1992. Currently, average monthly earnings of an employee of an agricultural enterprise equal only 77 per cent of the average earnings in the national economy. The wage disparity is more marked in developed regions than the backward ones. Low average earnings in agriculture are a consequence of a low income level of the sector. However, earnings are also impacted by big swings in the labour demand during the year and a low technological standard of production. Low earnings in agriculture also reflect the nature of ownership relations and the management quality. On the other hand, low earnings in agriculture are not attractive for the skilled and creative labour force, which impedes further development of this sector.

Business activity

The concentration of business entities in the individual regions of Slovakia is a good indicator of the prosperity of a particular region. It facilitates the identification of the structurally weak regions and targeting the economic aid so as to promote the development of small and medium-sized enterprises in rural regions. Transformed agricultural co-operatives, individual proprietors, and also other small businesses operating in other sectors of the economy, notably services, play an important role in enterprise. According to the statistical data of the Statistics Office of the SR, 295,750 natural persons including traders, free-lancers and self-employed professionals were recorded in 1999, which is 51,000 less than in the year before. The highest share of these business entities as a percentage of the national figure was reported in the districts of Žilina, Nitra, Dunajská Streda, Banská Bystrica, Nové Zámky, and Prešov (between 2.5 and 3.8 per cent). In interregional comparison, in the context of the economically active population, this share is reported to be highest in the districts of Pezinok, Senec, Galanta, B. Bystrica, and Dunajská Streda (15 per cent and over), which is conditioned by the locally high number of traders and sole proprietors. In contrast with the national average (0.7 per cent), a high share of individual proprietors (over 2 per cent) is reported in the districts of Rimavská Sobota, Dunajská Streda, and Trebišov. In the context of an overall business activity, on the opposite side of the list are the districts of Sobrance, Krupina, Poltár, and Medzilaborce. On the average, the business activity indicator expressed by the number of natural persons dealing in business per economically active inhabitant is 3 per cent higher in the developed regions than the backward regions. In 1999, 23 inhabitants and 11 economically active persons were reported per entrepreneur in the backward rural regions, while in the developed rural regions, 17 inhabitants and 8 economically active persons per entrepreneur were recorded.

The employment fund payments

The economic power of regions is also reflected in the payments of unemployment premiums per economically active inhabitant. In 1999, these payments totalled SKK 2,981, which is a drop in contrast with the year before (SKK 3,016). In terms of the unemployment premium collection, of the rural regions, the most economically powerful were the regions of Banská Bystrica, Zvolen (over SKK 4,000), and the districts of Trnava, Púchov, Trenčín, L. Mikuláš, Žilina, Poprad (over SKK 3,000). On the contrary, the weakest economic power in 1999 was recorded in the districts of Košice-environs, Sobrance, Sabinov (SKK 900-1,100). In the economically developed rural regions (A group), SKK 3,319 were collected per economically active inhabitant, while in the backward regions, only SKK 2,133. Hence, in the group of developed regions, unlike the backward regions, these payments were one thousand crowns higher. The collection of the unemployment insurance contributions takes account of not only the number of business entities but also their economic performance. However, certain distortion in the figures is apparent due to the fact that even lower organisational units make payments to larger communities, and the location in which an organisation operates need not always be identical to its seat.

COMPARISON OF THE ECONOMIC PERFOMANCE OF THE ENTERPRISES IN PRIMARY AGRICULTURAL PRODUCTION

Agricultural primary production is characterised by regional differentiation which is determined by socio-economic and natural conditions. Based on the analysis of the results of the operation of the enterprises in primary agricultural production for the selected A group– developed agricultural regions, and B group – backward agricultural regions, some interesting implications have been brought to light:

- On the average, agricultural enterprises having smaller areas of land (1,165 hectares) were found in the group of developed regions, and in contrast with the year before, their number was stable; on the contrary, in the group of backward rural regions, the number of enterprises continued to drop in each of the districts (14 per cent drop on the average), which is a drop above the national average.
- Labour intensity expressed by the number of employees per 100 hectares was higher in the group of developed regions (except for Banská Bystrica and Žilina, reported values exceeded 6), which is due to a higher share of productive land in this group. In the selected backward rural regions, average labour intensity hit 4.4.

Table 3. Ekonomic standard

District	Income from industrial activity [1]		Gross agricultural production of gross turnover[1] /		Average monthly earnings		Business entities		Unemployment premium payments
	million SKK current prices	% SKK	thousand SKK	% SKK	national economy	agriculture	number	% of economically active	per economically active citizen
Pezinok	2 104	0.4	468 826	1.2	10 282	9 769	4 084	15.1	2 378
Hlohovec	6 883	1.2	507 553	1.3	10 744	9 183	2 050	9.0	2 468
Piešťany	2 223	0.4	836 112	2.2	10 142	9 962	3 881	12.5	2 891
Trnava	16 988	2.9	1 310 958	3.4	11 269	9 583	6 689	10.6	3 756
Ilava	6 499	1.1	213 115	0.6	9 914	8 539	3 187	10.1	2 584
Prievidza	14 183	2.5	461 127	1.2	10 346	8 109	6 089	8.4	2 867
Trenčín	11 370	2.0	810 071	2.1	9 836	8 607	6 678	12.0	3 859
Žilina	14 192	2.5	490 994	1.3	10 313	8 619	10 649	13.1	3 452
Banská Bystrica	10 423	1.8	213 367	0.6	10 235	9 142	8 442	15.4	4 147
A group	**9 430**	**1.6**	**590 236**	**1.5**	**10 343**	**9 057**	**5 750**	**11.8**	**3 319**
Levice	6 404	1.1	1 860 334	4.9	9 590	8 080	6 241	10.5	2 748
Turčianske Teplice	458	0.1	392 784	1.0	8 733	7 706	715	8.0	1 971
Krupina	1 040	0.2	536 434	1.4	8 417	7 836	800	6.3	1 661
Poltár	850	0.1	292 163	0.8	8 412	7 394	720	6.4	1 561
Veľký Krtíš	1 192	0.2	864 837	2.3	8 118	7 731	1 745	7.9	1 603
Sobrance	88	0.0	176 361	0.5	7 929	8 102	701	6.4	1 127
B group	**1 672**	**0.2**	**687 152**	**1.8**	**8 533**	**7 808**	**1 820**	**8.7**	**2 133**
SR, total	**578 034**	**100.0**	**38 287 516**	**100.0**	**10 945**	**8 458**	**295750**	**11.1**	**2 981**

1/ enterprises with 20 and more employees
Source: Selected data on the SR regions in 1999, Statistics Office of the SR and own computations; National Labour Office

Table 4. Comparison of the Economics of Agricultural Enterprises *, by Land Price Groups

District	Group	Land price group	No. of agricultural enterprises		Share of profitable enterprises		Net income per hectare of agricultural land		Value added per hectare of agricultural land		No. of employees per 100 hectares of agricultural land		Value added per employee	
			1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Piešťany	A	17	20	20	70	70	−28	438	17 454	18 411	8.9	8.5	196 811	216 114
Trnava	A	18	30	31	27	58	−3 819	−89	13 265	14 252	6.9	5.6	191 796	252 485
Levice	B	16	53	46	57	39	−1 240	−1 746	8 839	6 371	5.7	4.8	155 152	131 384
Pezinok	A	16	16	18	31	39	−2 648	−1 723	12 417	12 582	7.6	6.7	163 228	188 009
Hlohovec	A	16	10	11	60	55	406	104	15 361	15 334	8.0	6.8	192 229	224 248
Levice	B	16	53	46	57	39	−1 240	−1 746	8 839	6 371	5.7	4.9	155 152	131 384
Trenčín	A	11	20	20	55	50	−151	−612	11 870	10 970	8.2	7.8	145 442	140 743
Veľký Krtíš	B	11	21	18	67	67	−181	−1 272	4 336	3 893	4.3	4.4	99 987	88 386
Ilava	A	10	7	7	43	43	−911	−974	11 978	10 625	7.5	7.1	158 892	148 647
Prievidza	A	10	18	15	50	60	−1 165	−802	6 922	6 850	6.8	5.9	102 122	115 478
Turč.Teplice	B	10	6	4	50	75	−6 043	−656	7 409	4 245	7.5	4.7	98 157	89 404
Krupina	B	10	20	17	70	35	−252	−1 382	5 162	3 440	4.9	4.1	105 292	83 204
Sobrance	B	10	17	17	77	53	554	521	1 718	1 612	3.2	4.1	53 035	52 981
B. Bystrica	A	7	23	24	48	38	−1 546	−1 252	4 646	4 542	4.6	4.1	101 616	110 294
Žilina	A	8	19	17	32	41	−1 154	−327	2 564	2 207	3.8	3.6	67 364	67 364
Poltár	B	9	5	3	40	33	−1 096	−1 693	3 659	3 403	4.6	4.1	79 885	83 426
SR total			**1 215**	**1 175**	**55**	**53**	**−626**	**−668**	**6 723**	**6 095**	**5.5**	**4.8**	**124 036**	**127 524**

*/ Legal persons, total
Source: Info sheets of the Ministry of Agriculture of the SR

- Reported net income was clearly better in the group of developed regions in which losses for the past two years were lower than in B group. In 1999, positive net income was reported by two districts of A group (Pieš•any, Hlohovec), and one district in B group (Sobrance).
- On the average, the share of profitable enterprises in the developed selected regions totalled 51 per cent, and in B group – backward regions – 48 per cent. According to the legal forms of enterprise in the individual selected groups, a higher share of co-operatives in the total number of enterprises was recorded in B group, i.e. 78 per cent (68 per cent in A group). Agricultural co-operatives and partnerships were proportionally represented in the total number of profitable enterprises of A and B groups (i.e. 2:1).
- The most dramatic differences between the developed and backward rural regions were recorded in value added. On the average, value added generated per hectare of agricultural land in A group was double the value recorded in B group.
- In the group of developed regions, labour productivity measured by valued added per employee was 25 per cent higher than the national average, and on the average, 58 per cent higher than in the group of backward rural regions.
- In 1998–1999, when comparing entities that operate roughly under identical natural conditions (by land price groups), a markedly higher value added per hectare and employee was reported in the group of developed rural regions than the group of backward rural regions. The disparity between these groups gets bigger with a higher proportion of quality soil.

CONCLUSION

Selected districts of the group of backward rural regions are characterised by a high employment in the agri-sector and a low population density, a high rate of unemployment and more than a half of the population lives in rural areas. These are largely districts with a mono-structure economy and an overall low level of socio-economic development. The inhabitants of these districts live mostly in small communities up to 200, or, 500, and have an unfavourable age structure.

Selected districts of the group of developed rural regions are characterised by a high population density, low share of the inhabitants that live in rural areas and work in agriculture, and an unemployment rate which is markedly below the national average. These are districts with a developed technological and socio-economic infrastructure, with habitation along the significant transportation routes and distinct urban centres.

The analysis of the relevant documentation has corroborated our hypothesis, namely, that the higher the socio-economic standard of the region in question, the better the economic indicators of agri-businesses enterprises that operate in it.

REFERENCES

Buchta S. (1999): Ekonomická sila vidieckych regiónov a politika trhu práce SR. Zem. Ekon., *45*, (11): 491–504.

Council Regulation (EC) No.1257/1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF).

Hrubý J. (1999): Vidiek v demografickej klasifikácii a vývojových zmenách. Zem. Ekon., *45*, (3): 113–116.

Michalek J. et al..(1998): Stratégia prispôsobenia pôdohospodárstva a vidieka. SR report in cooperation with FAO. Bratislava and Mannheim, 176 p.

Srnková Ľ. (1999): Výsledky monitorovania sociálno ekonomických problémov vidieka.Výskumné práce VÚEPP Bratislava, s. 61–64.

Střeleček F. et al. (2000): Venkovské regiony v plánu zemědělství a venkova ČR. Zem. Ekon.,*46*, (8): 373–379.

Arrived on 21st June 2001

Contact address:

Ing. Ľubica Srnková, Výskumný ústav ekonomiky poľnohospodárstva a potravinárstva, Trenčianska 55, 824 80 Bratislava, Slovenská republika
tel.+421 58 243 278, e-mail: Srnkova@vuepp.sk

INFORMATION

The advertising effect on wine consumption in Australia[1]

Efekt reklamy na dopyt po víne v Austrálii

A. HAVRILA

Research Institute of Veterinary Medicine, Košice, Slovakia[2]

INTRODUCTION

The Australian Wine Industry has been characterised by rapid growth in the market for grapes and wines since 1955–1956. A number of socio-economic factors have been responsible for shifting demand for Australian wine such as increased incomes, changes in relative prices, apparently successful promotion, popularization of cheap cask wines, changes in the proportions of different ethnic groups. On the other hand, grape-growers, winemakers, retailers, and government have been at work on the supply side. Rapid growth in the supply of wine grapes reduced input prices (grapes), downward pressure on wine prices and necessity for market expansion.

The favored method of expanding the domestic wine market has been through promotion, both brand specific and, in general, by increasing consumer information about wines. The thirty years from 1956 to 1986 – a period of rapidly increasing consumption (from 5 to 21 liters per capita) of wine in Australia covers the study. The Annual Report (1967–1968) of the Australian Wine Board remarked that:

- There are many explanations for the increase in consumption of wines and brandy in Australia over the past decade and the National Promotions Committee believes that the Board's programme has played a big part in helping stimulate a greater interest in wine and brandy in Australia. The national campaign commenced in 1954 when sales were comparatively stationary, and the programme has been a continuous one since then although many changes have taken place in the nature of advertising and promotion.
- The basic feature of the national campaign was its aim to increase the general demand for wine and brandy whereas for individual sellers ,the objective was to obtain a greater share of the market for their own brands (AWBA 1967–1968).
- The objectives of the study were to derive estimates of the parameters of economic relationship, including product, and consumer characteristics, which influence the demand for wine. One of the null hypotheses was that "advertising as typical of all kinds of product variation" has no effect on the consumption of wine. Advertising is defined here as product variation to encompass all non-price components of retailers offers which involve product variation costs including advertising.
- For the whole period, 1955 to 1986, for which the analysis was carried out, incomplete data were available from Owens (1979) study. His series related to advertising in the media for only a part of the period studied. Data on wine advertising or product variation expenditure were, as one might expect, not available from the Australian Bureau of Statistics or from other sources. For that reason, a series purporting to measure the implicit optimal level of "advertising" has been developed and used in this part of the study.

The theoretical framework for the calculation of expenditure on product variation as typified by advertising expenditure appears in Appendix A. where the derived (calculated) advertising expenditure is presented. Development of the series is based on the work of Dorfman and Steiner (1954) and Scitovsky (1951), who postulate that the marginal value product of advertising (μ) is equal to the ordinary price elasticity of demand (η). This in turn implies that an optimal choice of advertising budget and price is such that marginal gross revenue is equal to the marginal cost of advertising (product variation) expenditure. This condition is exploited for the calculation of optimal advertising expenditure presented in Appendix A.

THE EFFECT OF PROMOTION AND ADVERTISING

The most important act of citizens (in a free society) is that of choice. Economists have always assumed rational behaviour of consumers and producers. But in a complex society, how rational are we? How far can producers influence our choice?

[1]This article is mostly the part of the thesis for the degree of Master of Agricultural Science at La Trobe University, Melbourne.

[2]I wish to express my sincere gratitude to all those who helped mi with this work, but first of all to my supervisor J.J. Quilkey, at the time the Dean of School of Agriculture at La Trobe.

If indeed consumers, sovereignty does not exist, the whole basis of our thinking on the price mechanism needs qualifying.

We know that advertising is an important part of the marketing process, with the purpose of lubricating the market, to prepare it for new products and to develop the size of the market shares of existing products. Firms seek to gain an advantage over rivals as a result of strategic moves involving price, and non-price practices including promotion and advertising.

The main effect advertising or promotion may be to speed up expansion of demand, or to check or retard an adverse trend that would have occurred without advertising. An implication of this assertion in the advertising or promotion is provided, albeit more slowly or less efficiently, by consumer search. Many economists have simply assumed that there are increasing returns in advertising for theoretical and psychological reasons (e.g. Borden1944; Dorfman and Steiner 1954; Chamberlain 1962; Parish 1962). Borden (1944) argued that advertising may have less effect of demand shifts than basic sociological and environmental conditions. Parish (1962, p.29), using concepts from Borden (1944), further developed the notion of favourable characteristics for advertising.

In applying the foregoing ideas about what makes a product promotable to Australian farm products, I suggest, first, that the selling effort will be best rewarded when made on behalf of products which consumers want more of, or which they are unfamiliar with. On these criteria, the most likely candidates for successful promotion are commodities with a high-income elasticity of demand, and those which lend themselves to processing into new forms.

Wine seems to have been a product with most, if not all of the "favourable characteristics" in the 1950s. First, the presence of many potential consumers after the Second World War, when many European migrants came to Australia, might have favourably affected the demand for wine. Secondly, wine has important, hidden qualities (flavour or bouquet of wine), associated with powerful emotional buying motives. Roseé, cooler and 'pearl' wines are depicted in advertising as associated with leisure activities. Thirdly, income and price elasticity of demand were high (e.g. Taplin and Ryan (1969) made the assumption that the demand elasticity with respect to income was in the 1950s between 1 and 2). Finally, wine may be regarded as a product, which may be conveniently 'processed' into new forms such as new brands, new types of wine, and new packaging (casks).

Lane (2000, p.89) has challenged the problem even further, arguing:

- Advertisements heighten the salience of selected brand associations and thereby influence what consumers think about when they encounter an incongruent extension. That is, advertisements determine which elements of a brand image position the extension in consumers' mind and aid them in comprehending how the extension fits.
- The existence of opportunities to differentiate the product from competing products, and the existence of a favourable demand trend, may be a challenge for promotion. Increasing the demand for a product is the aim of promotion, so that consumer will buy more of the commodity at the same price, or the same amount or more at a higher price.

Waugh (1959) expounded the prospect of exponentially declining effects of advertising on demand, as a Decay curve, he argued (p.372) that:

- Probably current advertising expenditures are not a good demand shifter; that is, they are not highly correlated with current changes in the level and slope of the demand curve. We would expect some weighted total of past and present advertising expenditures to be much more successful in most cases.
- Promotion to increase the range of competing products aims to increase the elasticity of demand with respect to price. Alternatively, it may be profitable to aim advertising at the differentiation of the product from competing products to reduce the own price elasticity of demand, in order to maintain or increase prices.

Quilkey (1974) argues that both strategies are relevant in the general case, but for different periods of market adjustment:

- In the very short run, it may be appropriate to adopt a strategy of increasing the range of end uses of the product.
- In the longer run, differentiating the product acts as a barrier to entry and strengthens monopoly power.

Alden, Steenkamp and Batra (1999) studied the brand positioning through advertising in relation to consumer culture. They found out that for high-tech durable – symbolise the essence of modernism and internationalism – facilitate to use global consumer culture positioning in contrast to food – what we eat and how it is prepared – is useable for local consumer culture positioning of advertisement.

Alston (1980) identified two aspects of the effects of advertising on demand; the response variation according to the level of advertising, and the response variation over the time of advertising. He further argues that the sales response function of advertising expenditure is likely to have similar properties to those posited for the production function. Advertising may have no initial effect and then may exhibit increasing, diminishing, zero and negative marginal responses. Advertising expenditure reflecting a threshold expenditure for advertising to have an effect at early stage of highly productive advertising followed by diminishing returns, a satiety level, and a negative response arising from abrasive redundancy of an advertising message. Even in the study of Pieters, Rosbergen and Wedel (1999), it is argued that consumers attitude toward the advertisement may drop significantly across only a few repetitions; in such conditions satiation may set in rapidly.

Moreover, McClelland et al. (1971) argued that advertising response is related to either competitive or complementary of related products. They postulated that a

given level of advertising for competitive products shifts the response curve of the promoted product downward and complementary advertising upward creating an umbrella effect. Accepting their argument and assuming that wine and other alcoholic beverages are substitutes, advertising for beer or spirits shifts the response curve (consumption) of wine downward. On the other hand, advertising for good food and drink enjoyment off the ambience of restaurant may create an umbrella effect on wine consumption.

Recently, Tellis, Chandy and Thaivanich (2000) recognised that advertising has an instantaneous effect on referrals; carryover or delayed effect on behaviour, and may have some effect on attitude and memory that cannot be traced to referrals.

In the study Havrila (1989) and article Havrila (2000), accepting household production theory (Lancaster 1966), argues that the environment of consumption may be viewed as the level of technology in the household but differs by experience and information, level of education or race. Assuming this, the different information and knowledge results in a different pattern (habit) of consumption for different group of consumers. The effects of knowledge and information are taken into account as the effect of 'optimal' advertising expenditure on consumption of wine. However, assuming the effect of information (advertising) on consumption pattern, one ought to consider the existence of habit in wine consumption. Raghubir and Corfman (1999) discuss the issue of how price promotion is more than simply economic incentives to purchase a brand. They challenge the idea saying that in some situation price promotion may be served as an informational function.

The conditions for optimal advertising expenditure are determined by the price elasticity of demand and selling costs (Dorfman-Steiner 1954; Nerlove-Waugh; 1961, Parish 1962 and others). Dorfman and Steiner (1954, p. 826) have demonstrated that:

A firm, which can influence the demand for its product by advertising, will, in order to maximise profits, choose the advertising budget and price such that the increase in gross revenue resulting from a one dollar increase in advertising expenditure is equal to the ordinary elasticity of demand for the firm's product.

They argue that the necessary condition for profit maximising advertising at any level of is:

$$P\frac{\delta F}{\delta A} = \frac{P\delta F}{Q\delta P} \qquad (1)$$

where

$$\mu = P\frac{\delta F}{\delta A} \quad \text{and} \quad \eta = \frac{P\delta F}{Q\delta P} \qquad (2)$$

μ – is the marginal value product of advertising,
η – is the ordinary elasticity of demand with respect to price,
Q – is the quantity of the product sold per unit of time,
P – is the price of the product,
A – is the advertising expenditure on the product,
F – is defined as $Q = F(P, A)$

This study does include some remodelling of empirical studies, which include advertising as part of the model specification. The analysis is limited by the available data on promotion and advertising expenditure. Therefore, the derivation of optimal advertising is a necessary precursor to the review of empirical studies which emphasises other demand-influencing factors. The derivation and calculation of 'optimal' advertising expenditure is described in Appendix A.

THE EFFECT OF ADVERTISING ON WINE CONSUMPTION – MODEL AND ITS ESTIMATION

It is assumed that the effect of advertising is as above, and the following model is applied to estimate the effect of advertising on the demand for wine.

$$Q_t = \alpha_1 + (\alpha_m - \alpha_1) M_t + \beta_1 Q_{t-1} + \beta_2 Y_t + \beta_3 WP_t + \beta_4 BP_t + \beta_5 A_t + (\varepsilon_t - \lambda \varepsilon_{t-1}) \qquad (3)$$

Here A_t is the yearly index of the total advertising expenditure derived in Appendix A. Other variables are defined as:

Q – yearly domestic retail sales of wine in Australia (litres/capita),
Y – yearly average household disposable income in real 1980 dollars (dollars/head),
WP – wine price (yearly index deflated by the consumer price index (CPI),
BP – beer price (yearly index deflated by CPI),
Q_{t-1} – lagged dependent variable,
M – the proportion of stock of migrants to the total population times 100,
t – a year subscript (1 in 1955/1956,., to 31 in 1985/1986),
ε – an error term,
α, β – are regression coefficients,
$\alpha_m - \alpha_1$ – the change in the average level of consumption in the whole community due to the migrant population.

Inclusion of A_t in this form has been rationalised in other studies on a number of grounds, from ad hoc inclusion of advertising variable to explain demand, to the argument of Nichols (1985) that when equations of the form of (3) are estimated, the interpretation of β_5 is that where

– $\beta_5 > 0$ advertising is under supplied,
– $\beta_5 < 0$ advertising is oversupplied, and
– $\beta_5 = 0$ advertising is optimal.

In general, from economic theory one would expect that the signs of the coefficients in equation (3) would be as follows:

Variables	Coefficient	Expected sign
M_t	$\alpha_m - \alpha_1$	?
Q_{t-1}	β_1	+
Y_t	β_2	+
WP_t	β_3	–
BP_t	β_4	+
A_t	β_5	? (+)

Samuelson (1947) has pointed out that there is no a priori reason to expect that the effect of advertising on sales will be positive and that the outcome is a matter for empirical investigation.

As indicated earlier, Nichols (1985) has argued that under circumstances where a function such as equation (3) is estimated and the coefficient of the advertising variable A_t, $(\beta) = 0$, then advertising is optimally supplied. The variable, A_t, under these circumstances is redundant in the estimation of equation (3), but provides an opportunity through estimation of other parameters of the function, to obtain estimates of the advertising elasticity of demand and the associated own price, cross price and income elasticities. The Nichols' analyses were criticised by Hochman and Luski (1988).

The result of the analysis is presented in Table 1. The MLM is favoured over OLSQ due to the presence of serial correlation ($\rho = -0.083$ to 0.369). Little serial correlation is present in the models which include the variables Continental and Continental plus British Migrants (h-statistic = 0.15 and 0.27).

The results are inconclusive. The estimated coefficients for advertising are not statistically significant in any of the equations. In terms of the level of significance, the effect of advertising appears to be best exhibited in the model where the migration effect is represented by Total Immigration. However, the estimates of advertising variable $\beta_5 \geq 0$ indicates that advertising by Nichols argument is undersuplied. The F-statistics decreased in each of the equations if compared to the model without advertising (Table 2). The Chov test $F = 0.34$ is not statistically improved, since the $F_{6,24} = 2.51$ at 1% level.

However, the differences occurred in elasticities of demand. The own price elasticity of demand for wine is at the level that wine is slightly price elastic in the model of All Immigrants (Total) and Continental European Migration. Even better improvement of elasticities is in the price of beer (20%). The effect of advertising to the income elasticity is small – about 10% (Table 1 and 2). Thus, it can be argued that the advertising support the stability of demand if compared to competing products (beer).

The elasticity of demand with respect to "advertising" is very low (0.02 to 0.05). This low estimate may arise because advertising may have a higher indirect impact on market behaviour by enhancing the effects of price and income effects rather than through its direct effect. Therefore, the advertising is to be primarily aimed at polishing the demand for the product. Building the demand for the product is the second aim.

Similar conclusions were found in other studies. Metwally (1976) studied the profitability of advertising in Australia and concluded that the actual advertising/sales ratios of firms selling washing powder are much higher than the optimal ratio, the elasticity of demand with respect to advertising was estimated at 0.03–0.04 in this study.

Leeflang and Reuigl (1985) studied the fluctuations of industry sales with advertising expenditure on the West German cigarette market. They estimated a low elasticity of demand with respect to advertising – for annual data 0.35, for bimonthly data 0.16 and monthly data 0.14. They comment that advertising had a significant effect on industry demand.

Wittink (1977) studied the advertising-price interaction for an established product. He found that price sensitiv-

Table 1. The estimates of the model II (MLM)

Variable	Immigration			
	Total	European	CEM	CEM + British
	Q_t	Q_t	Q_t	Q_t
Rho	0.159	0.396	0.083	–0.139
C	–47.345	–55.925	–43.116	–42.596
	(–3.08)	(–2.91)	(–3.05)	(–3.12)
M_t	12.704	6.373	9.240	9.512^{CEM}
	(3.64)	(1.39)	(4.73)	(5.11)
				-2.868^{B}
				(–1.40)
Q_{t-1}	7.653	8.273	9.617	9.692
	(9.77)	(8.12)	(13.47)	(14.23)
Y_t	2.543	4.700	3.011	2.979
	(1.64)	(2.52)	(2.41)	(2.51)
WP_t	–11.514	–10.359	–11.202	–10.223
	(–7.15)	(–4.52)	(–8.06)	(–6.88)
BP_t	7.467	8.403	8.545	8.579
	(3.12)	(2.93)	(3.63)	(3.75)
A_t	0.327	0.14	0.208	0.233
	(1.81)	(0.82)	(1.25)	(1.40)
R^2	0.996	0.991	0.998	0.998
$\overline{R^2}$	0.995	0.989	0.997	0.998
DW	1.89	1.91	2.05	2.09
H	0.85	0.99	0.15	0.27
SSR	2.330	3.092	2.153	1.981
F	793.52	343.16	1413.76	1698.93
E_{ii}	–1.09	–0.98	–1.05	–0.96
E_{ij}	0.70	0.79	0.81	0.81
E_{iy}	0.24	0.44	0.28	0.28
E_{ia}	0.03	0.015	0.02	0.022
E^l_{ii}	–3.98	–4.66	–10.50	–10.66
E^l_{ij}	2.50	3.76	8.10	9.00
E^l_{iy}	0.86	2.09	2.80	3.11
E^l_{ia}	0.11	0.07	0.20	0.24

E_{ii} – the own price elasticity of demand
E_{ij} – the cross price elasticity of demand
E_{iy} – the income elasticity of demand
E_{ia} – the advertising elasticity of demand
E^l – the long-term elastities of demand
CEM – Continental European Migrants
B– British Migrants
DW – Durbin–Watson test
H – Durbin h–test

Table 2. The estimates of model I (MLM)

Variable	Immigration			
	Total	European	CEM	CEM + British
	Q_t	Q_t	Q_t	Q_t
Rho	0.014	0.281	−0.160	−0.204
C	−35.379	−50.907	−35.804	−34.973
	(−2.37)	(−2.79)	(−2.75)	(−2.76)
M_t	9.894	6.066	8.216	8.327^{CEM}
	(3.578)	(1.475)	(5.01)	(5.27)
				-2.414^{B}
				(−1.22)
Q_{t-1}	7.950	8.341	9.574	
	(10.54)	(8.62)	(13.97)	(14.48)
Y_t	2.254	4.293	2.696	2.667
	(1.52)	(2.41)	(2.25)	(2.30)
WP_t	−9.332	−9.534	−9.862	−8.906
	(−9.58)	(−5.34)	(−11.781)	(−7.925)
BP_t	5.235	7.558	6.910	6.811
	(2.29)	(2.85)	(3.48)	(3.52)
R^2	0.997	0.993	0.998	0.998
$\overline{R^2}$	0.996	0.991	0.998	0.998
DW	1.87	1.88	2.06	2.07
H	0.40	0.41	0.18	0.21
SSR	2.630	3.184	2.285	2.147
F	1278.08	570.87	2038.24	1750.60
E_{ii}	−0.88	−0.90	−0.93	−0.84
E_{ij}	0.49	0.71	0.65	0.64
E_{iy}	0.21	0.40	0.25	0.25
E^l_{ii}	−3.52	−4.28	−9.30	−8.40
E^l_{ij}	1.94	3.38	6.50	6.40
E^l_{iy}	0.84	1.90	2.50	2.50

Q_t– is the annual wine consumption per capita
E_{ii} – the own price elasticity of demand
E_{ij} – the cross price elasticity of demand
E_{iy} – the income elasticity of demand
E^l – the long-term elasticity of demand
The elasticities are calculated at mean values
CEM– Continental European Migrants
B– British Migrants

ity was higher in territories having higher advertising levels than in the low advertising territories. Farris and Reibsten (1979) studied the relationship between price and advertising using a cross sectional analysis. They revealed that brands with high relative advertising levels also commanded high prices. However, Raghubir and Corfman (1999), studying the price promotion in dentistry, found that offering a promotion is more likely to evaluate brand less when the brand has not been promoted previously.

CONCLUSION

The results of the estimation of the effect of advertising on the demand for wine should be regarded with some caution. Data for 'advertising' expenditure were not available. Thus, a theoretical value was calculated. The coefficient accounting for the effect of advertising in the Model is not statistically significant, but of positive sign and Nichols suggests that the outcome indicate that the advertising was under supplied. This can be taken, according Nichols, as tentative evidence of too little advertising. But, one can explain the result – not all other explanatory variables have been included to explain consumption of wine – the taxes were not included as explanatory in this model.

REFERENCES

Alden D.L., Steenkamp JB.E.M., Batra R. (1999): Brand Positioning Through Advertising in Asia, North America and Europe: The Role of Global Consumer Culture. Journal of Marketing, Vol.63, pp.75–87.

Alston J.M. (1980): The Economics of Advertising. Economics Branch Department of Agriculture, Victoria, Seminar Series No .30.

Australian Wine and Brandy Association (1967/1968 to 1985/1986): Annual Reports AWBA.

Borden N.H. (1944): The Economic Effect of Advertising, Irwin, Chicago.

Chamberlain E.H. (1962): The Theory of Monopolistic Competition. Harvard University Press, Cambridge.

Dorfman R., Steiner P.O. (1954): Optimal Advertising and Optimal Quality. American Economic Review, *44*, pp.826–836.

Farris P.W., Reibsten D.J. (1979): How Prices, Advertising Expenditure and Profits are Linked. Harvard Business Review, *57*, pp.17–35.

Havrila A. (1989): The Demand for Australian Wine – A Selective Study. Unpublished M.Agr.Sc. Thesis, LaTrobe University, Melbourne.

Havrila A. (2000): The Effect of Migrants on Consumption of Wine in Australia. Agric. Econ., *47*, (6): 272–280.

Hochman O., Laski I. (1988): Advertising and Economic Welfare: Comment. American Economic Review, 78, pp. 290–296.

Lancaster K.L. (1966): A New Approach to Consumer Theory. Journal of Political Economy, *74*, pp.135–157.

Lane V.R. (2000): The Impact of Ad Repetition and Ad Content on Consumer Perceptions of Incongruent Extensions. Journal of Marketing, *64*, pp. 80–91.

Leeflang P.S.H., Reuigl J.C. (1985): Advertising and Industry Sales: An Empirical Study of the West German Cigarette Market. Journal of Marketing, *49*, pp. 92–98.

McClelland E.L. et al. (1971): Optimal Allocation of Generic Advertising Budgets. American Journal of Agricultural Economics, *53*, pp. 505–572.

Metwally M.M. (1976): Profitability of advertising in Australia: A Case Study. Journal of Industrial Economics, *24*, pp. 221–231.

Nerlove M., Waugh F.V. (1961): Advertising Without Supply Control: Some Implication of a Study of the Advertising of Oranges. Journal of Farm Economics, *43*, pp. 813–837.

Nichols L. (1985): Advertising and Economic Welfare. The American Economic Review, *75*, pp. 213–218.

Owen A.D. (1979): The Demand for Wine in Australia, 1955–1977. Economic Record, *55*, pp. 230–255.

Ozga S.A. (1960): Imperfect Markets through Lack of Knowledge. Quarterly Journal of Economics, *74*, pp. 29–52.

Parish R.M. (1962): Possibilities for Promoting Farm Products. Review Marketing and Agricultural Economics, *7*, pp. 27–34.

Pieters R., Rosbergen E., Wedel M. (1999): Visual Attention to Repeated Print Advertising: A Test of Scanpath Theory. Journal of Marketing Research, *36*, pp. 424–438.

Quilkey J.J. (1974): The Demand for Rice and Its Relevance for Price and Promotion Polices. Unpublished Ph.D. Thesis, University of New England, Armadale.

Raghubir P., Corfman K. (1999): When Do Price Promotions Affect Pretrial Brand Evaluations? Journal of Marketing Research, *36*, pp. 211–222.

Samuelson P.A. (1947): Foundations of Economic Analysis. Harvard University Press, Cambridge.

Scitovsky T. (1951): Welfare and Competition. Homewood, Illinois.

Taplin J., Ryan W. (1969): The Prospect for Wine in Australia. Quarterly Review of Agricultural Economics, *22*, pp. 198–509.

Tellis G.J., Chandy R.K., Thaivanich P. (2000): Which Ad Works, When, Where, and How Often? Modeling the Effects of Direct Television Advertising". Journal of Marketing Research, *37*, pp. 32–46.

Waugh F.V.(1959): Needed Research on the Effectiveness of Farm product Promotion. Journal of Farm Economics, *41*, pp. 364–388.

APPENDIX A

Promotion and advertising have a place in this study. However, the analysis is limited by the available data. The optimal advertising expenditure is derived on the basis of the Dorfnam-Steiner theorem and the concept of variation cost presented by Scitovsky (1951).

A firm optimal advertising strategy in the case of a monopoly is accounted for by Dorfman and Steiner (1954) as a choice of the advertising budget and the price such that the increase in gross revenue, resulting from a one dollar increase in advertising expenditure, is equal to the ordinary price elasticity of demand for the product. Where

$$\mu = P\frac{\delta Q}{\delta A} \tag{4}$$

is the marginal value product of advertising and

$$\eta = -\frac{P\delta Q}{Q\delta P} \tag{5}$$

is the ordinary price elasticity of demand. Then it may be written $\mu = \eta$ or

$$P\frac{\delta Q}{\delta A} = \left|\frac{P\delta Q}{Q\delta P}\right| \tag{6}$$

and after rearrangement of the equation

$$\delta A = Q \times \delta P \tag{7}$$

and if δ is a small amount Δ, (7) may be rewritten as

$$\Delta A = Q \times \Delta P \tag{8}$$

which is similar to Dorfman- Steiner equation (3)

$$qdp - ds = -\left|q\frac{f_s}{f_p} + 1\right| ds \tag{9}$$

where qdp is the change in gross revenue and ds is the change in advertising expenditure. Now the positive level of advertising cannot be optimal unless the quantity as a modulus in (9) is zero. But in that case the right hand side of the equation is zero and

$$qdp = ds \tag{10}$$

which is the same as (8).

Dorfman and Steiner postulated that the conditions in equation (9) are necessary conditions for profit maximisation at any level of output.

On the other hand, the necessary condition for profit maximisation is satisfied by $\delta\Pi/\delta Q$ if

$$\Pi(Q) = R(Q) - C(Q) \tag{11}$$

and

$$\frac{\delta\Pi}{\delta Q} = \Pi'(Q) = R'(Q) - C'(Q) = 0 \tag{12}$$

Thus the optimum output (equilibrium output Q) must satisfy the equation $R'(Q) = C'(Q)$ or $MR = MC$. This is the first-order condition for profit maximisation. But equation (10) is $MR = MC$. This may be considered as similar to (12) since δA is the marginal cost of advertising, and $Q \times \Delta P$ is the marginal revenue as Reekie (1981) argued. Then form (12) the second order condition is

$$\frac{\delta^2\Pi}{\delta Q^2} = \Pi''(Q) = R''(Q) - C''(Q) < 0 \tag{13}$$

In that case, $(Q \times \Delta P)' < (\Delta A)'$, if the order condition for profit maximisation holds.

Table 3. Index of advertising wxpenditure

Year	Δ A^a	Δ AE^b	Δ $AARC^c$	Total Δ $AARC^d$	Transformed Δ $AARC^e$
1955/56	0	0	0	0.001	300.001
1956/57	1.980	1.980	2.010	2.011	302.011
1957/58	16.929	16.929	16.540	18.551	318.551
1958/59	19.850	19.850	19.477	38.028	338.028
1959/60	23.552	23.552	23.065	61.093	361.093
1960/61	17.028	17.028	16.498	77.591	377.591
1961/62	5.511	5.511	5.497	83.089	383.089
1962/63	7.056	7.056	7.111	90.200	390.200
1963/64	1.557	1.557	1.589	91.789	391.789
1964/65	12.466	12.466	12.396	104.185	404.185
1965/66	24.112	24.112	24.693	128.878	428.878
1966/67	11.362	11.362	11.923	140.801	440.801
1967/68	26.052	26.052	26.924	167.725	467.725
1968/69	89.177	89.177	88.222	255.948	555.948
1969/70	27.132	27.132	27.948	283.896	583.896
1970/71	52.080	52.080	49.706	333.602	633.302
1971/72	-5.789	-5.789	-5.888	327.714	627.714
1972/73	-77.441	-77.441	-84.317	243.397	543.397
1973/74	-102.460	-102.460	-113.220	130.177	430.177
1974/75	-7.336	-7.336	-7.790	122.387	422.387
1975/76	87.825	87.825	87.521	209.908	509.908
1976/77	-75.579	-75.579	-79.198	130.710	430.710
1977/78	-47.841	-47.841	-49.779	80.779	380.779
1978/79	-48.780	-48.780	-53.559	27.371	327.371
1979/80	-100.672	-100.672	-106.813	-79.442	220.558
1980/81	-45.009	-45.009	-46.894	-126.336	173.664
1981/82	-65.157	-65.157	-67.780	-194.116	105.884
1982/83	-45.875	-45.875	-47.415	-241.531	58.469
1983/84	13.363	13.363	13.508	-228.022	71.978
1984/85	45.195	45.195	45.435	-182.587	117.413
1985/86	-103.734	-103.734	-106.593	-289.180	10.820

a – Change of advertising expenditure ($dA = Q \times dP$)
b – Change of advertising expenditure ($dAE = P \times dQ/E$)
c – Change of adv. exp. Calculated by arc elasticity
d – Total adv. exp. = sum of changes in adv. exp. from arc. el.
e – otal adv. exp. plus 300
Q – Wine consumption per capita
P – Index of wine price deflated by CPI

Since $Q \times \Delta P = VC$ (variation cost), the equilibrium is approached, as Scitovsky argues (p. 308) when:

Every attribute of the sellers offer must be such that its marginal revenue is equal to marginal cost, in other words, the variation cost of each attribute must be equal to the difference between price and marginal cost.

This argument may be plausible since

$$MR = P - VC \tag{14}$$

And the conditions for profit maximisation hold if

$$MC = MR = (P - VC) \tag{15}$$

On this assumption, it may be said that it is possible to calculate the theoretical advertising expenditure from the (8) such that

$$\Delta A = Q \times \Delta P \tag{16}$$

The calculation of ΔA is provided here, using two methods of calculation:

1. using equation (8) $\Delta A = Q \times \Delta P$
2. by use of the arc elasticity formula and from equation (4) and (5):

$$\eta = P\frac{\Delta Q}{\Delta A} \tag{17}$$

and

$$\Delta A = \frac{P \times \Delta Q}{\eta} \quad (18)$$

where
A – the index of advertising expenditure. Index 1980 = 100,
Q – the quantity consumed per capita,
P – an index of the price of wine,
Δ – the "change" in income, price or advertising expenditure
η – the price elasticity of demand (point or arc elasticity).

The derived advertising expenditure is presented in Table 3. However, the observations obtained for advertising expenditure is an index not of the total expenditure but the change (delta) in expenditure. On the other hand, all other variables in regression models are expressed in the total value. Therefore, the advertising index is in terms of total expenditure.

The total value of advertising expenditure TA was derived by summation of deltas as:

$$TA_1 = \Delta A_1;$$

$$TA_2 = \Delta A_1 + \Delta A_2;$$

$$TA = \sum_{t=1}^{3} \Delta A_t$$

$$TA_n = \sum_{t=1}^{n} \Delta A_t$$

where
TA – is total value of advertising expenditure for the year t.
ΔA_t – delta (change) of advertising expenditure in year 1 to n in comparison to previous year, defined as in equation 16 or 18.

However, ΣTA are negative and it was necessary to add an arbitrary value (300) to each observation of TA. The transformed regressor of advertising expenditure is of the form:

$$A_t = TA_t + 300 \quad (19)$$

The transformed total advertising expenditure is presented in Table 3.

Contact address:

Ing. Andrej Havrila, M.Agr.Sc., Výskumný ústav veterinárnej medicíny, Hlinkova 1/A, 04001 Košice, Slovenská republika
e-mail: havrila@vuvm.sk

INSTRUCTIONS FOR AUTHORS

Original scientific papers, short communications, and selective reviews (i.e. papers based on the study of agricultural literature and reviewing recent knowledge in the given field) are published in this journal. Articles s are published in English, reviews and information also in English, Czech and Slovak. Each manuscript must contain an English and a Czech summary (including key words). Czech abstracts will be provided for foreign authors. The author is fully responsible for the originality of his paper, for its subject and format. The author should make a written declaration that his paper has not been published in any other information source. The board of editors of this journal will decide on paper publication, with respect to expert opinions, scientific importance, contribution and quality of the paper. The paper should not exceed 15 typescript pages, including tables, figures and graphs.

Manuscript layout: paper of standard size (210 × 297 mm), double-spaced typescript. A PC diskette should be provided with separate text and graphic files. Tables, figures and photos should be enclosed separately. The text must contain references to all these appendices.

If any abbreviation is used in the paper, it is necessary to mention its full form for the first time it is used, abbreviations should not be used in the title or in the summary of the paper.

The **title** of the paper should not exceed 85 characters. Subheadings are not allowed.

Abstract should contain the subject and conclusions of the paper, not a mere description of the paper. It must present all substantial information contained in the paper. It should not exceed 170 words. It should be written in full sentences and contain basic numerical data including statistical data. It must contain keywords. It should be submitted in English and, if possible, also in Czech.

Introduction has to present the main reasons why the study was conducted, and the circumstances of the studied problems should be described briefly.

Review of literature should be a short section, containing only references closely related to the main topic of the paper.

Only original **methods** should be described, in other cases cite the method used and any modifications. This section should also contain a description of experimental material.

In the **Results** section figures and graphs should be used rather than tables for presentation of quantitative values. A statistical analysis of recorded values should be summarized in tables. This section should not contain either theoretical conclusions or deductions, but only experimental data.

Discussion contains an evaluation of the study, potential shortcomings are discussed, and the results of the study are compared with previously published results (only those authors whose studies are closely related to the published paper should be cited). The section Results and Discussion may be presented as one section.

The **References** section contains citations arranged alphabetically according to the surname of the first author. References in the text include the author's name and year of publication. Only the papers cited in the text of the study should be included in the list of references.

The author should give his full name (and the names of other collaborators), academic, scientific and pedagogic titles, full address of his workplace and postal code, telephone and fax number or e-mail.

The manuscript will not be accepted by the editorial office in case its format does not comply with these instructions.

POKYNY PRO AUTORY

Časopis uveřejňuje původní vědecké práce, krátká sdělení a výběrově i přehledné referáty, tzn. práce, jejichž podkladem je studium literatury a které shrnují nejnovější poznatky v dané oblasti. Statě jsou uveřejňovány v angličtině, informace v angličtině, češtině nebo slovenštině. Rukopisy musí být doplněny anglickým a českým abstraktem (včetně klíčových slov). Autor je plně odpovědný za původnost práce a za její věcnou i formální správnost. K práci musí být přiloženo prohlášení autora o tom, že práce nebyla publikována jinde. O uveřejnění práce rozhoduje redakční rada časopisu, a to se zřetelem k lektorským posudkům, vědeckému významu a přínosu a kvalitě práce. Rozsah vědeckých prací nesmí přesáhnout 15 strojopisných stran včetně tabulek, obrázků a grafů. V práci je nutné používat jednotky odpovídající soustavě měrových jednotek SI (ČSN 01 1300).

Vlastní úprava rukopisu: formát A4, mezi řádky dvojité mezery. K rukopisu je třeba přiložit disketu s prací pořízenou na PC a s grafickou dokumentací. Tabulky, grafy a fotografie se dodávají zvlášť. Na všechny přílohy musí být odkazy v textu.

Pokud autor používá v práci zkratky jakéhokoliv druhu, je nutné, aby byly alespoň jednou vysvětleny (vypsány), aby se předešlo omylům. V názvu práce a v souhrnu je vhodné zkratky nepoužívat.

Název práce (titul) nemá přesáhnout 85 úhozů. Jsou vyloučeny podtitulky článků.

Abstrakt je informačním výběrem obsahu a závěru článku, nikoliv však jeho pouhým popisem. Měl by vyjádřit vše podstatné, co je obsaženo ve vědecké práci, a má obsahovat základní číselné údaje včetně statistických hodnot. Musí obsahovat klíčová slova. Nemá překročit rozsah 170 slov. Je třeba, aby byl napsán celými větami, nikoliv heslovitě. Je uveřejňován a měl by být autory dodán v angličtině a češtině.

Úvod má obsahovat hlavní důvody, proč byla práce realizována, a velmi stručnou formou má být popsán stav studované otázky.

Literární přehled má být krátký, je třeba uvádět pouze citace mající úzký vztah k problému.

Metoda se popisuje pouze tehdy, je-li původní, jinak postačuje citovat autora metody a uvádět jen případné odchylky. Ve stejné kapitole se popisuje také pokusný materiál.

Výsledky – při jejich popisu se k vyjádření kvantitativních hodnot dává přednost grafům před tabulkami. V tabulkách je třeba shrnout statistické hodnocení naměřených hodnot. Tato část by neměla obsahovat teoretické závěry ani dedukce, ale pouze faktické nálezy.

Diskuse obsahuje zhodnocení práce, diskutuje se o možných nedostatcích a práce se konfrontuje s výsledky dříve publikovanými (požaduje se citovat jen ty autory, jejichž práce mají k publikované práci bližší vztah). Je přípustné spojení v jednu kapitolu spolu s výsledky.

Literatura by měla sestávat hlavně z lektorovaných periodik. Citace se řadí abecedně podle jména prvních autorů. Odkazy na literaturu v textu uvádějí jméno autora a rok vydání. Do seznamu literatury se zařadí jen práce citované v textu.

Na zvláštním listě uvádí autor plné jméno (i spoluautorů), akademické, vědecké a pedagogické tituly a podrobnou adresu pracoviště s PSČ, číslo telefonu a faxu, resp. e-mail.

Rukopis nebude redakcí přijat k evidenci, nebude-li po formální stránce odpovídat těmto pokynům.

AGRICULTURAL ECONOMICS ZEMĚDĚLSKÁ EKONOMIKA

Volume 47, No. 9 September 2001

CONTENTS

AGRICULTURAL ECONOMICS ZEMĚDĚLSKÁ EKONOMIKA

Ročník 47, č. 9 Září 2001

OBSAH

Vědecký časopis ZEMĚDĚLSKÁ EKONOMIKA ● Vydává Česká akademie zemědělských věd – Ústav zemědělských a potravinářských informací ● Redakce: Slezská 7, 120 56 Praha 2, tel.: + 420 2 27 01 03 02, fax: + 420 2 27 01 01 16, e-mail: rott@uzpi.cz ● Sazba a tisk: ÚZPI Praha ● © Ústav zemědělských a potravinářských informací, Praha 2001

Rozšiřuje Ústav zemědělských a potravinářských informací, referát odbytu, Slezská 7, 120 56 Praha 2, tel.: + 420 2 27 01 03 85, e-mail: finance@uzpi.cz