DISCUSSION PAPER

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COMPETITIVENESS OF MILK AND WINE PRODUCTION AND PROCESSING IN ALBANIA

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ABSTRACT

This study provides an empirical assessment of the competitiveness of Albanian dairy and wine production, based on specifically collected survey data. For both product groups, the analysis is carried out on two levels: farm level production of raw material and processing and manufacturing of the final product in the food industry. In a third step, both levels are aggregated to analyse the competitiveness of the entire production chain for each product group. Overall, the wine sector appears in an economically more favourable situation than the milk sector. Although there is currently no relevant export of wine, there has been considerable investment activity at the farm level and the harmonisation of quality standards with EU legislation is currently pursued. Grape processing is currently profitable. Small farm and herd sizes limit the profitability and efficiency of dairy farming. Fragmented and dispersed production units increase the costs of milk collection. International quality standards are by far not met. This is partially due to the high share of informally traded milk and the importance of direct sales to consumers. It is therefore unlikely that Albanian dairy products will become internationally competitive in the near future.

JEL: P23, Q12, Q13

Keywords: Agricultural sector, competitiveness, milk, wine, Albania.

ZUSAMMENFASSUNG

WETTBEWERBSFÄHIGKEIT VON MILCH- UND WEINPRODUKTION UND -VERARBEITUNG IN ALBANIEN

Die vorliegende Studie beinhaltet eine Einschätzung der Wettbewerbsfähigkeit der albanischen Milch- und Weinproduktion, die sich auf spezifisch gesammelte Betriebsdaten stützt. Für beide Produktgruppen wird eine Analyse auf zwei Ebenen durchgeführt: Erzeugung der Rohprodukte und Verarbeitungsstufe. In einem dritten Schritt werden die Teilergebnisse der beiden Ebenen zu einer Gesamtbewertung der Wettbewerbsfähigkeit der jeweiligen Produktions- und Verarbeitungskette zusammengeführt. Insgesamt präsentiert sich der albanische Weinsektor in ökonomisch günstigerer Verfassung als der Milchsektor. Auch wenn der Export von albanischem Wein derzeit keine Rolle spielt, werden die notwendigen rechtlichen Rahmenbedingungen für die Sicherung von Qualität und Herkunftsbezeichnung bei Wein werden derzeit geschaffen. Auf der Erzeugerebene wurden in den vergangenen Jahren bereits größere Investitionen durchgeführt. Die Verarbeitungsstufe weist positive wirtschaftliche Ergebnisse auf. Milchproduktion und -verarbeitung leiden unter mangelnden Hygienestandards und einem stark informell geprägten, untransparenten Markt für Frischprodukte. Unter diesen Bedingungen fällt es den Molkereien schwer, sich wirtschaftlich zu behaupten. Es ist daher nicht zu erwarten, dass albanische Milchprodukte in nächster Zeit international wettbewerbsfähig sein werden.

JEL: P23, Q12, Q13

Schlüsselwörter: Agrarsektor, Wettbewerbsfähigkeit, Milch, Wein, Albanien.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES IN THE ANNEX

LIST OF ABBREVIATIONS

BMZ	German Ministry of Economic Co-operation and Development
CEEC	Central and Eastern European Countries
EU	European Union
€	Euro (European currency unit)
FAO	Food and Agriculture Organization
GDP	gross domestic product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IAMO	Institute of Agricultural Development in Central and Eastern Europe
MoAF	Ministry of Agriculture and Food of Albania
US-$	US-Dollar

1 INTRODUCTION

Albania is the single European country in which agriculture still contributes almost one half to gross domestic product (GDP). With 49 per cent in GDP this is the highest share within Europe. At the same time, Albania is among the poorest European countries, with a GDP per capita of 1330 US-$ only (all figures for 2001, according to EBRD, 2003, p. 41). According to OECD statistics, on average 75 per cent of household income were spent on food in 1998 (TRZECIAK-DUVAL, 1999, p. 289). Officials from the Albanian Ministry of Agriculture and Food (MoAF) assume that "Albania has been, is, and will remain for several decades a country dominated by the agricultural activity" (MoAF, 2002a, p. 6). It is hence reasonable if not inevitable to consider agriculture in any strategic planning of the country's future development. Despite the importance of agriculture for the national economy, Albania is a net importer of agricultural products: according to MoAF (2002a, p. 104), the value of total food imports amounted to 227 millions of US-$ in 2000, whereas total food exports were worth only 28.7 millions of US-$. However, in the process of approximation to the European Union (EU), Albania seeks potential export opportunities to EU and international food markets. Among the traditionally produced agricultural goods in Albania are milk and milk products as well as wine. Against this background, the objective of the present study is to investigate the competitiveness of the existing Albanian milk and wine producing chains and to identify potential bottlenecks for future development of these sectors.

1.1 Project background and objectives

This study was commissioned by the Albanian Ministry of Agriculture and Food, organisationally supported by *Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)* and financially supported by the German *Ministry for Economic Co-operation and Development (BMZ)*. The project was carried out in co-operation between GTZ and IAMO on the German side and Albanian local experts and experts from MoAF.

The objective of the project is to provide an empirical assessment of the competitiveness of Albanian dairy and wine production. The final products of the dairy chain include butter, cheese, yoghurt, and others, whereas wine production is only concerned with table wines. For both product groups, the analysis is carried out on two levels:

1. Farm level production of raw material and
2. Processing and manufacturing of the final product in the food industry.

In a final step, both levels are aggregated to analyse the competitiveness of the entire production chain for each product group. Apart from a general analysis of background and statistical data on both product groups, the core of the study is formed by a quantitative analysis of survey data both from the farm and industry level. The data was specifically collected for this study and initially encompassed farm level data from 40 dairy farms and 60 grape growers as well as detailed information from ten milk processors and seven wine factories.[1] The present study uses typical farm and processing budgets drawing on the survey data to derive quantitative measures of profitability and competitiveness. Based on these budgets and indicators, an overall assessment of the sectors' competitiveness is carried out and critical factors influencing economic success are identified.

[1] This is qualified by the fact that a large share of the processing data turned out to be not sufficiently reliable for quantitative analysis, see below.

1.2 Overview of the research report

Section 0 gives some basic background information on the Albanian agricultural sector. Section 0 introduces the methodology for assessing competitiveness and outlines the empirical approach of the study. Section 0 presents the empirical results for the milk chain. Section 0 presents those for the wine chain. Section 0 derives the final conclusions and policy recommendations.

2 ALBANIA'S AGRICULTURAL SECTOR

Table 1 gives an overview of a number of key structural and productivity figures for Albanian agriculture. Although agriculture is of exceptional importance for the overall economy, the average productivity of crop and milk production is comparably low.

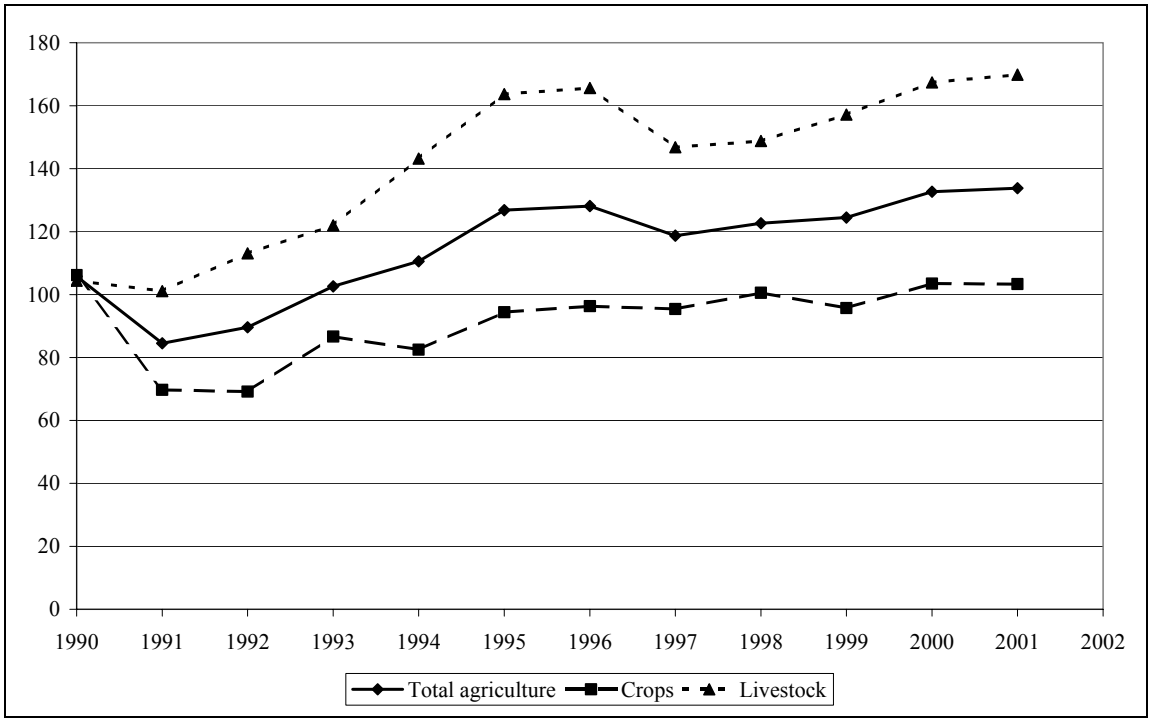
Table 1: Albania – Key figures on agriculture in 2001

Share of agriculture in GDP (%)	49.0
Population active in agriculture (ths. persons)	1496.0
Share of agricultural population in total (%)	47.6
Arable land (ths. ha)	699.0
Pastures (ths. ha)	440.0
Value of gross agricultural output (mln. €)	2065.8
Total cereals production (ths. tons)	517.2
Cereals yields (dt/ha)	28.5
Total cow milk production (ths. tons)	840.0
Cow milk yield (kg/cow)	1904.8

Sources: EBRD, 2003; FAOSTAT, 2003; MoAF, 2002b; authors' calculations.

Even so, production indices have shown a steady upward trend since 1991 (). Already in 1993, the 1989-91 average value was surpassed. This is in marked contrast to many other Central and Eastern European Countries (CEEC), where pre-transition output volumes are still not reached again, and commonly regarded as a key benefit of the far-reaching and strict restructuring and privatisation process in Albanian agriculture in the early 1990s (LERMAN, 2000, see also below). After 1991, the only drop in agricultural output occurred in 1997, probably as a side-effect of the political turmoil in that year. Furthermore, increases in livestock production were much steeper than in crop production, which is also a difference to general trends among the CEEC. The growth in livestock production is attributed to the comparative advantage of dairy vis-à-vis cereals on less fertile soils and its lower requirements of intermediate inputs (KODDERITZSCH, 1999, p. 4).

Figure 1: Production indices of Albanian agriculture

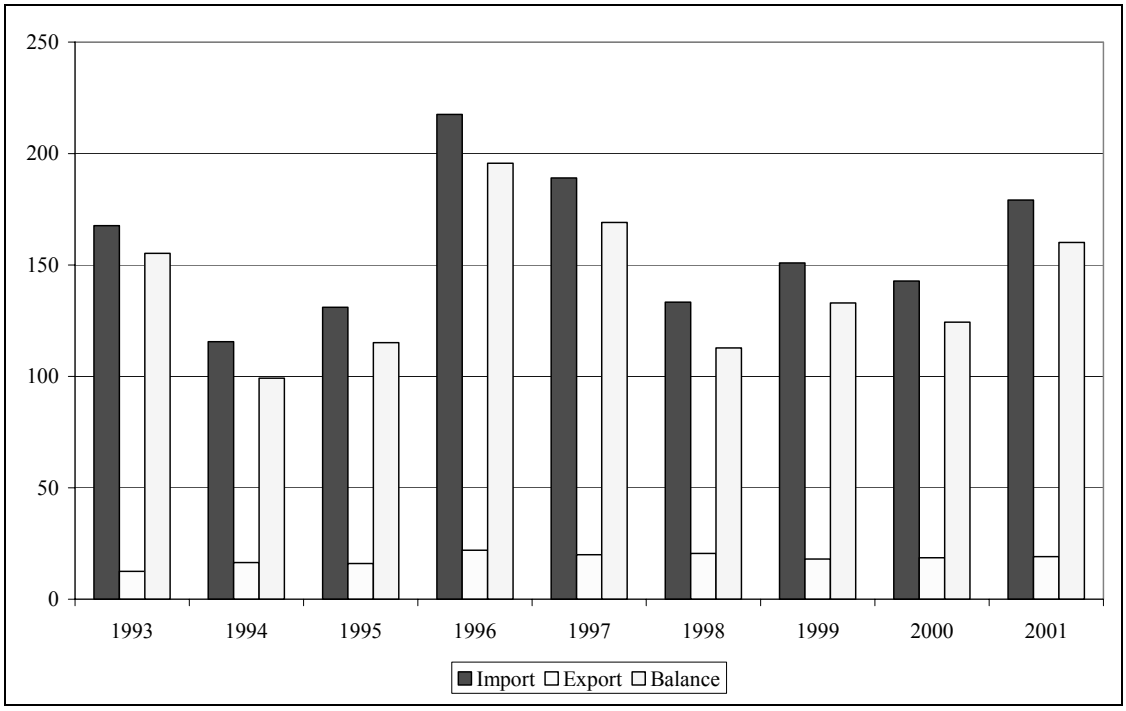


Notes: Average 1989-91=100.

Source: FAOSTAT, 2003.

Despite the production increases in agriculture, Albania has been a net importer of food products over recent years. Major trading partners are the EU as well as the neighbouring countries Serbia and Montenegro and Macedonia. Figure 2shows food trade with the EU. Import includes all major food product groups. Among the current major export products of Albania are medicinal plants, tobacco, and tomatoes (MoAF, 2002a, p. 104). Currently, neither milk products nor wine are exported in significant amounts.

Figure 2: Albania's agricultural trade with the European Union (in mln. €)



Source: IAMO database.

Albania undertook a radical land reform at the beginning of the transition process, which led to the complete dismantling of former state-managed farms and agricultural producer cooperatives (MoAF 2002a; CUNGU and SWINNEN, 1999). In contrast to other CEEC, land was distributed among the rural population and not restituted to former owners.[2] This led to an enormous fragmentation of land, as Table 2 illustrates.

Table 2: Changing farm structures in Albania

	1990	1996
Number of farms	550	470,000
Average farm size (ha)	1,060	1.1

Source: KODDERITZSCH, 1999, p. 5.

The former 550 state-managed farms with an average size of 1,060 ha were split up into 470,000 small-scale family farms of on average 1.1 ha agricultural land. Note that only arable land was privatised. Furthermore, a fraction of it was refused by the recipients due to low quality or unfavourable location (MoAF, 2002a, pp. 17-18). As a result, Albania's agriculture is today dominated by a large number of very small farms, most of which are run on a subsistence base with little market integration and commercialisation.

There is little detailed information available on the current state of the food processing industry in Albania. It seems that the government has largely ceased to exert direct control over food processors. Currently, most processing is done on relatively small, privately owned plants. Crucial impediments to the further development are seen in the outdated technology, lack of capital and the high costs of raw product collection due to the fragmented farm structure (KODDERITZSCH, 1999, pp. 4-5). Details on the milk and wine sectors are given below.

[2] Among the major reasons for this specific pathway were the large rural population share and the very unequal pre-1945 land distribution (see CUNGU and SWINNEN, 1999).

3 THEORY AND METHODOLOGY OF ANALYSING COMPETITIVENESS

3.1 Defining competitiveness

Competitiveness is an indicator of the ability to supply goods and services in the location and form and at the time they are sought by buyers, at prices that are as good as or better than those of other potential suppliers, while earning at least the opportunity cost of returns on resources employed (FREEBAIRN, 1986, p. 2, cited in FROHBERG and HARTMANN, 1997, p. 5). As FROHBERG and HARTMANN (1997, p. 5) note, this definition includes two types of competition: first, the competition on domestic and international product markets and thus the ability to gain and maintain market shares, and second, the competition in factor markets, where those factors employed in producing the goods have to earn at least the opportunity costs. Although pointing to different aspects, both types are indicative of the fact that competitiveness is a relative measure. One always has to make the comparison with a base value. In the case of a market share, it is with regard to market size. If one assesses competitiveness in factor markets, the relation is to the value a factor would have in another production process. FROHBERG and HARTMANN (1997) also distinguish between measures of *ex-post* and *potential* competitiveness. Whereas the assessment of ex-post competitiveness is based on observed market outcomes of the past (e.g. in the form of market shares), potential competitiveness either relies on accounting methods to analyse cost structures or on simulation models. In the case of ex-post competitiveness, the products under investigation must already be present on the interesting markets to make their performance observable, while this is not necessary in the case of potential competitiveness.

Applying these considerations to the study of the Albanian milk and wine sectors makes clear that the analysis has to focus on the *potential* competitiveness of these products and on their competition in *factor markets*. This follows from the above observation (Section 0) that neither milk nor wine are currently exported to international food markets. In the subsequent analysis we therefore concentrate on the cost structure of the milk and wine chains and the relation of costs and revenues. By investigating observed domestic marketing channels we provide an analysis of *domestic profitability* as a first prerequisite for domestic and international competitiveness. International competitiveness is further examined by considering the importance of *tradable* and *domestic production factors* separately. This leads to the computation of chain-specific resource cost ratios (RCRs).

3.2 Profitability and resource cost analysis

Our analysis of profitability aims at the computation of performance indicators of wine and milk production on typical farms and processors, using an approach that is akin to traditional gross margin calculation. However, fixed production factors such as machinery and family labour are generally taken into account, therefore one drawback of gross margins which only regard variable costs is avoided (FROHBERG and HARTMANN, 1997, p. 11). The general procedure is to collect all relevant cost items of each production chain and to subtract these from the achieved revenue, thus obtaining a measure of profitability. This is done for both the farm level and the processing level separately. By normalising the results on a per raw equivalent basis, we also analyse the overall domestic profitability of each chain. As will be seen below, an assessment of the relevant opportunity costs for the most important production factors on each level are of crucial importance for evaluating competitiveness at this stage of the analysis.

In a second stage, we analyse the importance of tradable and non-tradable inputs in the production of the goods under investigation. This is done by computing *resource cost ratios* (RCRs) for each commodity. The RCR measures the relative efficiency of domestic factor use

in terms of international cost competitiveness. It compares the opportunity cost of domestic production (i.e. the cost of using primary domestic production factors and non-traded inputs) with the "value-added" (returns – cost of tradable inputs):

$$RCR_i = \frac{\sum_{j=k+1}^{n} a_{ij} V_j}{P_i - \sum_{j=1}^{k} a_{ij} P_j^b} = \text{cost of non-tradable inputs / (returns – cost of tradable inputs)}$$

where:

a_{ij} : technical coefficient for the use of production factor or input *j* per unit of output *i*, where the output is traded if $j \leq k$ and non-traded if $j > k$

V_j : shadow price of domestic factor and non-traded intermediary input *j*.

P_i : price of output *i* in the selected market destination (returns).

P_j^b : border price (world market price) of tradable input *j*.

The RCR is hence calculated on the basis of costs and returns net of taxes and subsidies, i.e. it is based on "social costs" instead of "private costs" of production (see MONKE and PEARSON, 1989; MORRIS, 1990). Thus, the real economic value of domestic production factors in terms of scarcity and opportunity costs should be determined. This allows the following interpretation of RCR values (Table 3).

Table 3: Interpretation of resource cost ratios

RCR value	Statement	Interpretation
0<RCR<1	Comparative advantage	The cost of domestic resources used is less than the tradable value added
RCR>1	No comparative advantage	The cost of domestic resources used is larger than the tradable value added
RCR<0	No comparative advantage	More foreign exchange is used for production than the tradable value added

Source: Adapted from MORRIS, 1990, p. 16.

In general, the closer the RCR is to zero from above, the more tradable value added is earned from the employed domestic resources.

In the subsequent analysis, we put less weight on the computation of social prices vis-à-vis private prices. This is motivated by the fact that policy intervention on both factor and product markets is almost nil in Albania. The only intervention we took into account was the value added tax (VAT) on processed goods (see below). The (shadow) price of the major input at the farm level production, namely family labour, had to be estimated anyway, since no market price for this input is observed.

3.3 Empirical approach of the study

A critical factor in using accounting methods for the analysis of competitiveness is the lack of appropriately detailed and representative data (FROHBERG and HARTMANN, 1997, pp. 11-12). The current study addressed this problem by collecting primary data from farmers and processors specifically for the purposes of this research. The survey includes data from 40 specialised dairy farms and 60 wine growers. Furthermore, the initial plan was to collect data from

ten processors for each commodity. However, obtaining reliable data for processors turned out to be very complicated. Although ten milk processors and seven wine processors were surveyed, only the data of two milk and two wine processors could be used in the final analysis. The data was collected in spring 2003 in co-operation with MoAF, the Agricultural University of Tirana, and local experts.

Based on the survey data, representative activity budgets for each level and each commodity group were constructed. Prices as well as input and output quantities were determined according to a statistical analysis of the data sample. This produced more reliable results for the farm level and less reliable results for the processing level. Due to the much smaller number of valid observations for the second, the processing analysis must be regarded as statistically much less robust than the farm level analysis.

4 COMPETITIVENESS OF ALBANIAN MILK PRODUCTION

4.1 Introduction

Generally, livestock production is seen as a backbone of Albania's agriculture. The value of livestock production was 80,164 millionsleke[3] in 2001, which is 44 per cent of the total value of agricultural production (MoAF, 2002b). Livestock products constitute a main source of food, and a high share of production still serves subsistence purposes. More specifically, *dairy* activities have a long tradition in Albania due to the favourable natural resource base for dairy production. In the plains, cattle production is dominant, while in the hills and mountains, sheep and goat production are more suitable. Traditional handcrafted products include yoghurt, butter, curd and different kinds of cheese from cow, sheep and goat milk.

The land privatisation programme initiated in 1991 created a structure of primary production that is characterised by extremely small plot and herd sizes. In the 1990s, two phases of dairy development have been described: until 1994, production increases were based on rising animal numbers, while in the second phase yield increases were observed (XHAXHIU and URUCI, 2002). Yet the intensity of production is low compared to European standards.

The dairy processing industry, along with it the milk collection system, are still in the course of modernising structures and technologies. In the late 1950s, the first milk processing plants were established in different regions of the country. While most small processing units use traditional craftsmanship technologies until today, a number of modern processing plants are operating successfully, although these are struggling with the competition from informal markets. Nevertheless, consumers are discovering their preference for processed products such as pasteurised or condensed milk, fruit yoghurt and ice cream – mainly for quality and food safety reasons.

4.2 Economic environment of milk production

4.2.1 Policies and legal framework

Due to the significance of livestock and milk production, particularly in rural areas, MoAF has selected the milk sector as a policy priority. The Albanian government and MoAF are inclined to support primary production and the dairy industry. One of the stated objectives is to improve the competitiveness of products in order to substitute for import and increase export potential.

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[3] The official exchange rate in July 02 was 1€=142.4 leke. Albania applies a floating exchange rate regime, and the currency has been relatively stable over the past year.

The legal framework of milk production is not yet in conformity with European standards. The food law which came into effect in 1995 determines "the conditions for production, processing, conservation, distribution, control and marketing of food products used for consumers" (XHAXHIU and URUCI, 2002). However, it does not include any regulations on milk. There are so-called sub-legal acts on milk production and a veterinary service law which need to be improved and enforced. The improvement of the legislation for milk production is under way. There are no policies directly intended to influence the development of the dairy industry (URUCI, 2003).

The system of value added tax (VAT) is a major problem for the processing industry. A 20per cent tax is charged on all products. Since farmers are excluded from VAT payments, the tax is levied on processed products only. This increases the retail price and aggravates competition of processed products compared to the informal market.

4.2.2 Domestic supply of milk and dairy products

On the farm level, there are currently 441,000 cows, 1,440,000 sheep and 782,000 goats producing milk (in 2001). Milk production in the plain areas is mainly based on cattle, while sheep and goats play an important role in the hilly and mountainous areas. In 2001, total milk production was 984 thousand tons, 85.3 per cent of which is cow milk (840 thousand tons). Sheep and goat milk account for 7.3 per cent respectively, with a production of 72 thousand tons. This results in a per capita production of 280 litres of milk per person and year[4] (MoAF, 2002b). Due to the lower overall importance of sheep and goat milk, the quantitative analysis below concentrates on cow milk production.

In 2001, the dairy industry produced 4,650 thousand l of processed milk. In addition, the processors supplied 2,222 tons of yoghurt, 8,056 tons of cheese and 334 tons of butter (MoAF, 2002b).

It is assumed that less than half of the milk produced in Albania is marketed (see Section 0 below), and only 12 per cent reaches the processing industry (XHAXHIU and URUCI, 2002, p. 4). The remaining produce is consumed by the farming households or sold in the informal market. These figures reveal the importance of livestock and dairy production for sustaining rural livelihoods.

4.2.3 Foreign trade

93 per cent of consumer demand is currently met by local products and 7 per cent by imports. In 2001, the main imported products are UHT milk (2,813 tons), cheeses (936 tons), fruit yoghurt and other milk products (863 tons), powdered milk (791 tons), butter (645 tons), ice cream (373 tons) and condensed milk (MoAF, 2002b). The countries of origin are primarily Italy, Greece, Austria, Slovenia and other European countries. Tables 4 shows quantities, values and unit prices of some imported dairy products for 2001.

Table 4: Import of dairy products (2001)

Product	Quantity imported (ton)	Total value of imports (1000 leke)	Unit price (leke/kg)	Unit price (€/kg)
Milk	2,813	185,682	66	0.47
Cheese	936	302,485	323	2.31
Butter	646	131,655	204	1.46
Dairy products	863	79,185	92	0.66

Source: MoAF, 2002b.

[4] Authors' calculation. Population: 3,510,484 persons (July 2001, estimate, CIA World Factbook).

WTO accession in September 2000 and the implementation of a number of bilateral free trade agreements with the countries of the region are expected to stimulate competition with imports of higher quality on the domestic market (MoAF, 2002a, pp. 101-103).

It should be stressed that currently, there are no relevant exports of Albanian dairy products.

4.3 Structure of the sector

4.3.1 Primary production

According to the MoAF Agricultural Survey 2001, the total number of farms in Albania was 403,445 in 2001. Among these, 312,345 farms or 77,4 per cent produce milk. 224,591 farms or 55,7 per cent sell livestock products (MoAF, 2002c).

The total number of cattle on livestock farms is 652,335 heads. 62.5 per cent are cows (407,960 heads).[5] The average herd size of cattle farms is 2.2 animals per farm. Only 3.6 per cent of the cattle farms own five or more animals.

Table 5: Structure of milk production (2001)

	Cattle	Sheep	Goat
Farms with cattle, sheep or goat (no.)	302,745	86,838	48,835
Animals (heads)	652,335	1,554,230	717,558
Average number of animals (heads/farm)	2.2	17.9	14.7
Farms producing milk (no.)	300,861	86,043	48,239
Farms with milk sales (no.)	136,922	2,689	2,742
Farms with sales in per cent of farms keeping animals	45.6	3.1	5.7
Milking animals (heads)	407,960	n.a.	n.a.
Average number of milking animals (heads/milk producing farm)	1.35	n.a.	n.a.
Milk yield (kg/head)	2,054	n.a.	n.a.
Milk production per year (1000 litres)	838,088	n.a.	n.a.

Note: n.a.=not available or subject to internal inconsistency.

Source: MoAF, 2002c, authors' calculation.

Table 5 illustrates the small-scale structure and the subsistence orientation of dairy farms in Albania. On average, 2.2 heads of cattle are kept (only regarding farms that keep cattle at all), which includes calves, heifers and bulls. Thus, the number of milking cows is smaller (1.35 per farm on average). Only about 45 per cent of cattle farms sell any of their produce. Sheep and goat products are, according to these figures, only sold by a minor fraction of farms. Productivity levels are rather low for cow milk production (no data available for sheep and goats).

4.3.2 Input supply and services

Major inputs into farm-level dairy production are farm-grown forage or pasture and family labour. In 2001, 440,000 ha of land were used for permanent pasture, which is 15 per cent of the total land area. An additional 164,000 ha were dedicated to forage production, which equals 41 per cent of total field crop plantings. Forage production is estimated to be 4,750 thousand tons, with an average yield of 289.1 dt/ha (MoAF, 2002b).

[5] Note the slight difference to the data presented above. Different statistics give different figures (here results of the agricultural survey, above statistical yearbook).

Concentrate is used to a small extent, the same applies to fertilisers for forage production. Both are traded by private dealers, but, according to KODDERITZSCH (1999, p. 28), a lack of credit on the farmers' side inhibits an expansion of their use.

In recent years, emphasis was placed on animal breeding as a means to raise productivity. Pure bred cattle (Jersey, Holstein Friesian, Black and White, Brun-Alpina) have been imported, but as a result of breeding combinations mixed breeds are now predominant.[6] The number of small ruminants expanded over recent years, consisting of imported Merino and Cigaja crossbreeds among sheep and local breeds among goats (KODDERITZSCH, 1999, p. 28).

Veterinary services are provided by private veterinarians, although, due to a lack of liquidity, farmers often cannot afford the treatment of animal diseases.

4.3.3 Milk collection system

The milk collection and distribution system is characterised by informal organisation, meaning that there is no formalised contractual system. Depending on the distance from the urban markets, farmers have the choice to sell their milk directly to the consumers or small shops, to local processing units or to collectors. The collectors again can decide to sell to consumers, rural or urban processors. For large processors in urban areas, milk collection is a major cost factor, while it is a cost advantage for small rural processors.

4.3.4 Processing industry

Traditional farm processing was complemented by a centralised milk processing system that was initiated in the late 1950s. Still, the major bottlenecks of the production chain are the fragmentation of milk supply, the inefficiency of the milk collection system and the lack of transport infrastructure. Only 12 per cent of the milk produced in Albania reaches the processing industry. The remaining part of the production is used for direct domestic consumption, home processing or self-marketing. 40 per cent of the milk collected by the processing industry is used for pasteurised milk, the rest is processed into yoghurt, cheese, butter, powdered or condensed milk and ice cream. In 2000, 102,420 tons of milk were used for pasteurised milk (XHAXHIU and URUCI, 2002).

About 400-500 processing units are currently operating throughout Albania. A heterogeneous structure can be observed. The milk processing industry is divided into traditional and half-mechanised small processing units (baxho) on the one hand and dairy plants with a processing capacity of 10-70 tons/day on the other. Three groups of processing units can be distinguished according to the use of processing technologies (URUCI, 2003):

- The first group is made up of 17 dairy plants with modern technological equipment and established control systems. These mechanised dairy plants are usually situated in urban areas. Recent investments amount to 2.2 millionsUSD. The total milk processing capacity of this group is 250 tons/day. As actual production is 70 t/day, only 30 per cent of the processing capacity are utilised (URUCI, 2003). There are limiting factors both on the supply and on the demand side. It is difficult to obtain enough raw milk with sufficient quality. On the demand side, processed products face competition with the informal market (XHAXHIU and URUCI, 2002).
- The second group consists of about 60 mechanised or half-mechanised processing units with a capacity of 2-8 tons/day (URUCI, 2003).

[6] There is no information available about the use of artificial insemination. Its use is however definitely not widespread.

- The thirds group comprises about 340 small traditional cheese plants in rural areas. Their main products are traditional cheeses (XHAXHIU and URUCI, 2002). Only a small percentage of these rural processors is mechanised and most of them only operate seasonally. The level of investments is very low. Especially in the south of Albania, sheep and goat milk is processed. Good potential for keeping small ruminants and low labour costs contribute to the profitability of producing traditional cheese products for the domestic market. Some speciality products may even have a potential for export (URUCI, 2003). One of the main cost advantages of these small rural processors is the low cost of milk collection, but transport and marketing costs for the end product (which is mainly sold on the Tirana market) are high.

4.3.5 Quality issues

There is no functioning system for the control of raw milk quality, and raw milk sales are still uncontrolled, imposing major risks to public health. Only the larger mechanised processors have implemented an internal system of quality control. Closed cooling chains from producer to consumer are still rare, in most cases cooling equipment is not available. EU quality and food safety standards are not yet implemented.

Health-related issues are now gaining importance. There is no system of animal health control, so that zoonotic and food-borne diseases constitute a major threat to the consumers. This is a problem on both informal and formal markets, and the establishment of health control will be a major cost factor throughout the production chain.

4.3.6 Marketing

The commercial market is divided into the formal and the informal market (URUCI, 2003). Processed and packaged products face severe competition from informal raw milk sales and sale of loose traditionally crafted products. One important cost factor in the formal market is imposed by regulations and tax restrictions, especially VAT. On the consumer side, there is still a lack of consciousness on prices paid for quality. For example, in the shops, products of different standards are often sold at the same price. The price for raw milk paid to farmers is fixed according to fat percentage, but there is no control, so that farmers can easily abuse this system. A major problem for farmers is the lack of a contractual framework and the delay of payments (XHAXHIU and URUCI, 2002).

Although the Albanian dairy industry can be characterised by improving technologies, hygienic conditions and control systems, it is still far from being competitive with developed countries. Yet it is believed that the industry will be able to compete with products from neighbouring countries, especially when Albania continues to harmonise programs and practices with those of the European Union (URUCI, 2003).

4.4 Farm level profitability

The subsequent analysis of the farm level and processing stages of milk production is based on primary survey data. As indicated above, this turned out to be more reliable and comprehensive for the farm-level, as compared with the processing level. We are therefore able to present several, partly regionally differentiated scenarios for the farm level beside a ‘base run’ reflecting a typical farm in a nationwide view.

4.4.1 Base run: productivity, cost structure, and profitability

Table 6 shows the key assumptions concerning a typical milk producer in a nationwide view. The assumptions were derived from a statistical analysis of the survey data and somewhat reflect

a median farm in the overall sample, consisting of 40 farms in the regions of Korce, Kucove, Lushnje, Permet, and Tirane. Only specialised dairy farms were considered. To summarise the most important figures, the typical farm keeps four milking cows with an average milk yield of 2,900 kg/year, receives a milk price of 35 leke, sells two pieces of cattle per year, and has available 1.5 ha of land for grazing and fodder production. As will be seen below, the opportunity cost of family labour is of crucial importance for an assessment of the production costs. Based on reported wages for farm workers and expert consultations, it is for the moment assumed to be at 70 leke/hour (which equals 0.50 € per hour). This is slightly above the mean wage paid for hired farm labourers. Detailed data sheets on which the following calculations are based can be found in the Annexes.

Table 6: Key data on typical dairy farm (base run)

Major outputs and prices		
No of milking cows	heads	4
Milk produced per cow	kg/year	2900
Milk price	leke/kg	35
	€/kg	0.25
Cattle sold	heads	2
Cattle price	leke/head	50,000
	€/head	357
Major inputs and prices		
Land	ha	1.5
Labour	hours/year	3,900
Wage (opportunity costs of labour)	leke/hour	70
	€/hour	0.50

Note: Assumed exchange rate: 1 € = 140 leke.

Source: Survey data, authors' calculations.

Cost structure and profitability of the typical dairy farm are presented in Table 7.The figures are given on a per cow and per kg basis. The revenue consists of milk and beef sales in a ratio of four to one. The most important cost component is family labour. Its cost is almost six times the cost of the second most important item, which is farm grown fodder. 'Buildings & machinery' include depreciation and maintenance, 'animal health & services' include veterinary costs, vaccinations, medication, water, electricity, and materials (see Annex 2). Note that owned farm land and capital are assumed to have zero opportunity costs. This is justified by the fact that the typical farm solely works on owned land, land purchases are rare events, and alternative capital investment opportunities (even such as savings accounts) are often not accessible for farmers.

Table 7: Cost structure and profitability of milk production (base run)

	Leke/cow	**€/cow**	**Leke/kg**	**€/kg**
Revenue				
Milk	101,500	725	35.00	0.25
Beef	25,000	179	8.62	0.06
Total revenue [A]	**126,500**	**904**	**43.62**	**0.31**
Costs				
Farm grown fodder	12,475	89	4.30	0.03
Concentrate	4,600	33	1.59	0.01
Animal health & services	2,325	17	0.80	0.01
Buildings & machinery	4,688	33	1.62	0.01
Labour	68,250	488	23.53	0.17
Total costs [B]	**92,338**	**660**	**31.84**	**0.23**
Profit [A]-[B]	**34,163**	**244**	**11.78**	**0.08**

Source: Survey data, authors' calculations.

Given these assumptions, the typical dairy farm operates profitably, generating an annual profit of 34,200 leke or 244 € per cow, which is equal to 12 leke or 0.08 € per kg milk.

4.4.2 Scenario calculations

To check the robustness of the results for the typical farm presented above, the following four scenarios were calculated:

1. Zero opportunity cost for family labour (wage=0).
2. Milk productivity increase by ten per cent at constant costs (+10 per cent milk).
3. Typical dairy farm for the region of Tirane.
4. Typical dairy farm for the region of Lushnje.

In the first two scenarios, single assumptions of the base run were modified. In the first scenario, the opportunity cost for family labour was set to zero, whereas all other assumptions remained in place. Similarly, in the second scenario, only the milk productivity was changed.

The first two scenarios were motivated by the following considerations. First, since it is often unobserved, the opportunity cost of family labour is particularly difficult to assess. It is crucially dependent on the availability of alternative employment opportunities for the farm population. Substantive off-farm employment may be a real alternative in regions close to urban centres, such as Tirane. However, in remote rural areas, these opportunities may often be not available at all, so that the opportunity cost goes to zero. Second, due to the increasing spread of high-yielding breeding cattle as outlined earlier or improving management skills of peasant farmers, productivity increases may be possible through technical progress by almost zero additional cost.

The results of the first two scenarios are given in Table 8As was to be expected, profitability in both scenarios increased. In the zero wage scenario, profit per cow almost tripled compared with the base run, whereas it increased by about 30 per cent in the productivity increase scenario. By these figures, dairy farming is an economically viable activity in a national comparison. For example, in the zero wage scenario, two cows approximately yield the Albanian gross domestic product per capita. The revenue and cost structure per kg milk seems even to be broadly competitive with West European production systems.

Table 8: Cost structure and profitability of milk production (scenarios 1 & 2)

	Leke/cow			€/cow	
Scenario	**Base run**	**Wage=0**	**+10% milk**	**Wage=0**	**+10% milk**
Revenue					
Milk	101,500	101,500	111,650	725.00	797.50
Beef	25,000	25,000	25,000	178.57	178.57
Total revenue [A]	**126,500**	**126,500**	**136,650**	**903.57**	**976.07**
Costs					
Farm grown fodder	12,475	12,475	12,475	89.11	89.11
Concentrate	4,600	4,600	4,600	32.86	32.86
Animal health & services	2,325	2,325	2,325	16.61	16.61
Buildings & machinery	4,688	4,688	4,688	33.48	33.48
Labour	68,250	0	68,250	0.00	487.50
Total costs [B]	**92,338**	**24,088**	**92,338**	**172.05**	**659.55**
Profit [A]-[B]	**34,163**	**102,413**	**44,313**	**731.52**	**316.52**
	Leke/kg			**€/kg**	
	Base run	**Wage=0**	**+10% milk**	**Wage=0**	**+10% milk**
Revenue					
Milk	35.00	35.00	35.00	0.25	0.25
Beef	8.62	8.62	7.84	0.06	0.06
Total revenue [A]	**43.62**	**43.62**	**42.84**	**0.31**	**0.31**
Costs					
Farm grown fodder	4.30	4.30	3.91	0.03	0.03
Concentrate	1.59	1.59	1.44	0.01	0.01
Animal health & services	0.80	0.80	0.73	0.01	0.01
Buildings & machinery	1.62	1.62	1.47	0.01	0.01
Labour	23.53	0.00	21.39	0.00	0.15
Total costs [B]	**31.84**	**8.31**	**28.95**	**0.06**	**0.21**
Profit [A]-[B]	**11.78**	**35.31**	**13.89**	**0.25**	**0.10**

Source: Survey data, authors' calculations.

The third and fourth scenario aim to depict the situation given in certain regions more accurately. The broadest database was available for the regions of Tirane and Lushnje (see map in Annex 1); in both regions is dairy farming of major importance. In contrast to the first two scenarios, more of the assumptions of the base run were now changed. The key data is shown in Table 9.

Table 9: Typical dairy farms Tirane and Lushnje

		Base run	Tirane	Lushnje
Major outputs and prices				
No of milking cows	heads	4	2	7
Milk produced per cow	kg/year	2,900	2,900	2,700
Milk price	leke/kg	35	50	25
	€/kg	0.25	0.36	0.18
Cattle sold	heads	2	0.5	5
Cattle price	leke/head	50,000	50,000	50,000
	€/head	357	357	357
Major inputs and prices				
Land	ha	1,5	0.5	1.5
Labour	hours/year	3,900	4000	3200
Wage (opportunity costs of labour)	leke/hour	70	70	70
	€/hour	0.5	0.5	0.5

Source: Survey data, authors' calculations.

The table illustrates that, compared with the base run, farms in Tirane keep less and farms in Lushnje more cows. This goes hand in hand with smaller farm sizes as such. However, productivity figures in Lushnje are a bit lower than in the base run. There is also a price gap for milk: milk prices in Tirane are higher and in Lushnje are lower than the average. According to farmers' statements, cattle sales are less frequent in Tirane than in Lushnje.[7] Since Lushnje city is a regional urban centre, opportunity costs are assumed to be the same as in Tirane.

Table 10 reveals considerable differences in dairy profitability as a result of these regional adjustments of the data, both on a per cow and per kg basis. Lower milk prices and productivity in Lushnje lead to much lower milk revenues per cow, which are only partially compensated by higher beef sales. However, the labour intensity per cow is much higher in Tirane, so that labour costs are substantially higher at given opportunity costs. High labour costs in Tirane completely eat up the revenue advantage in this region, so that overall profitability per cow is only at about 2,700 leke or 19 € per cow. To the contrary, the much more favourable relation between labour input and dairy output in Lushnje results in a profit figure that is much higher than in the base run, at about 57,500 leke or 410 € per cow. The results per kg milk are varying accordingly. Therefore, the conclusion holds that dairy production in Albania can be done profitably at the farm level, although there appear to be substantial differences between regions. Larger herd sizes and a lower labour intensity currently imply a comparative advantage for the Lushnje region as compared with Tirane region.

[7] It is not quite clear whether this reflects a lower cow fertility or simply more home consumption of beef. In the latter case, the competitiveness of farms is underestimated, since due to lack of data home consumption is not considered in the analysis.

Table 10: Cost structure and profitability of milk production (scenarios 3 & 4)

		Leke/cow		€/cow	
Scenario	**Base run**	**Tirane**	**Lushnje**	**Tirane**	**Lushnje**
Revenue					
Milk	101,500	145,000	67,500	1036	482
Beef	25,000	12,500	35,714	89	255
Total revenue [A]	**126,500**	**157,500**	**103,214**	**1125**	**737**
Costs					
Farm grown fodder	12,475	6,045	7,129	43	51
Concentrate	4,600	3,450	2,629	25	19
Animal health & services	2,325	3,100	1,321	22	9
Buildings & machinery	4,688	2,250	2,679	16	19
Labour	68,250	140,000	32,000	1000	229
Total costs [B]	**92,338**	**154,845**	**45,757**	**1106**	**327**
Profit [A]-[B]	**34,163**	**2,655**	**57,457**	**19**	**410**
		Leke/kg		**€/kg**	
	Base run	**Tirane**	**Lushnje**	**Tirane**	**Lushnje**
Revenue					
Milk	35.00	50.00	25.00	0.36	0.18
Beef	8.62	4.31	13.23	0.03	0.09
Total revenue [A]	**43.62**	**54.31**	**38.23**	**0.39**	**0.27**
Costs					
Farm grown fodder	4.30	2.08	2.64	0.01	0.02
Concentrate	1.59	1.19	0.97	0.01	0.01
Animal health & services	0.80	1.07	0.49	0.01	0.00
Buildings & machinery	1.62	0.78	0.99	0.01	0.01
Labour	23.53	48.28	11.85	0.34	0.08
Total costs [B]	**31.84**	**53.39**	**16.95**	**0.38**	**0.12**
Profit [A]-[B]	**11.78**	**0.92**	**21.28**	**0.01**	**0.15**

Source: Survey data, authors' calculations.

4.5 Processing level cost structure and profitability

As indicated above, the data availability on the processing level did not allow such a differentiated analysis as for the farm level. In particular, the input to output ratios reported for many processing companies turned out to be quite implausible, so that a strong bias in either input or output figures must be assumed. Only two companies, one in each of the regions also analysed at the farm level, reported credible data on production activities. Both belong to the group of dairy plants with modern technical equipment (section 0). These formed the basis for the analysis presented in Table 11.

Table 11: Characteristics of milk processors in Tirane and Lushnje

	Tirane	Lushnje	Tirane	Lushnje
Production capacity tons/day	15	25		
Actual production tons/day	4	10		
Revenue	**Leke/ton raw milk**		**€/ton raw milk**	
Yoghurt	23,332	2,441	167	17
Pasteurised milk	17,143	3,107	122	22
Butter	783	355	6	3
Youghurt sauce	1,323	62	9	0
White cheese	0	17,758	0	127
Curd	0	16	0	0
Total revenue	**42,580**	**23,739**	**304**	**170**
Costs				
Raw milk	30,000	31,000	214	221
Operational costs	6,225	1,074	44	8
Capital	485	79	3	1
Labour	4,509	4,201	32	30
Packaging	6,575	10,419	47	74
Total costs	**47,795**	**46,772**	**341**	**334**
Profit per ton processed milk	**-5,214**	**-23,032**	**-37**	**-165**
Return on sales %	**-12**	**-97**	**-12**	**-97**

Source: Survey data, authors' calculations.

The table allows an assessment of both the revenue and the cost structure of the two processing companies. Both companies are not producing at their full capacity, which is smaller for the Tirane processor. Whereas the Tirane company is primarily producing yoghurt and pasteurised milk, the Lushnje processor is specialised in white cheese, which complicates the direct comparison of both. However, Table 12 shows that at least for yoghurt and pasteurised milk, sale prices are lower in Lushnje than in Tirane. Overall, the revenue generated from one ton of processed milk is much smaller in Lushnje as compared with Tirane (Table 11).

Table 12: Sale prices for milk products in Tirane and Lushnje region (leke/kg and €/kg net of VAT)

Product	Tirane	Lushnje	Tirane	Lushnje
	Leke/kg		**€/kg**	
Yoghurt	58	46	0.41	0.33
Pasteurised milk	38	33	0.27	0.24
Butter	333	333	2.38	2.38
Yoghurt sauce	108	117	0.77	0.84
White cheese	n.a.	167	n.a.	1.19
Curd	n.a.	58	n.a.	0.41

Notes: n.a. = not available.

Source: Survey data, authors' calculations.

At the same time, the overall cost structure is similar for both companies. Besides raw milk, packaging is the second most important cost item. As Table 11 shows, revenues do not suffice to cover costs for both companies. Given the data we have available, both companies currently make a loss from each ton of raw milk processed. The loss is at 5,200 leke or 37 € per ton raw milk processed in Tirane and 23,000 leke or 165 € per ton in Lushnje. This results in a return on sales of –12 per cent in Tirane and –97 per cent in Lushnje. As can be further seen from the table, losses cannot be buffered by covering them with the values set aside for depreciation, which are included in the capital item. It is hence questionable how these companies can survive without additional liquidity from outside.

4.6 Domestic profitability and resource cost ratios

In a final step, we investigate the competitiveness of the entire milk chain encompassing the raw milk production and processing stages by an analysis of domestic profitability and resource cost ratios. For this purpose, both stages have to be combined in an appropriate way. In Table 13, we show regional milk chains for both regions in the study, Tirane and Lushnje. In addition, we combined the base run, zero wage and increased milk productivity scenarios with the processing stage in Tirane, which, due to the lower loss, appears as the most reliable one. In all stages, nominal market prices were used. Only the sale prices for processed goods were net of VAT.

Table 13: Competitiveness of milk production chain

Farm production			**Tirane**	**Lushnje**	**Base run**	**Wage=0**	**+10% milk**
Processing			**Tirane**	**Lushnje**	**Tirane**	**Tirane**	**Tirane**
Domestic profit		leke/t raw milk	**-24,299**	**4,248**	**1,566**	**25,101**	**3,677**
Cost of domestic factors[a] [A]		leke/t raw milk	50,674	4,647	22,838	<1[b]	21,224
Of which	Farm family labour	leke/t raw milk	48,276	11,852	23,534	0	21,395
	Hired workers processing	leke/t raw milk	4,509	4,201	4,509	4,509	4,509
Tradable revenue [B]		leke/t raw milk	42,580	23,739	42,580	42,580	42,580
Cost of tradables [C]		leke/t raw milk	16,205	14,844	18,176	18,176	17,679
Total costs [A]+[C]		leke/t raw milk	66,879	19,491	41,014	17,480	38,903
Domestic profit		€/t raw milk	**-174**	**30**	**11**	**179.29**	**26.26**
Cost of domestic factors[a] [A]		€/t raw milk	362	33	163	<1[b]	152
Of which	Farm family labour	€/t raw milk	345	85	168	0	153
	Hired workers processing	€/t raw milk	32	30	32	32	32
Tradable revenue [B]		€/t raw milk	304	170	304	304	304
Cost of tradables [C]		€/t raw milk	116	106	130	130	126
Total costs [A]+[C]		€/t raw milk	478	139	293	125	278
RCR [A]/([B]-[C])			1.92	0.52	0.94	<0.01	0.85

Notes: [a] beef sales count as negative resource costs. [b] negative value due to compensation by beef sales, see text. For division into tradables and non-tradables see Annex 2. Major tradables at the farm level were fertiliser and concentrate, labour was the major non-tradable. Tradables at the processing level were energy and packaging, whereas again labour was regarded as non-tradable.

Source: Authors' calculations.

The *domestic profit* reflects the profitability of the entire milk chain *without* regarding which stage gets how much of the profit. It is even possible that one stage is loss-making, although the domestic profit is positive – this is in fact the situation in Albania, where, according to our data, milk processors currently cannot cover their entire production costs. The key factor affecting who gets how much of the profit within the chain is the price of the raw product paid to primary producers, in our case the price of raw milk.

Table 13 demonstrates that except for the first combination, all columns display a positive domestic profit. Since in Tirane, farm production of milk is less profitable than in other regions,

the profit from farming does not suffice to compensate the loss in the processing stage. The situation is different in Lushnje: although the profitability of the processing stage is much lower (the loss is higher) than in Tirane, the more profitable raw milk production is able to make the overall chain profit-making.

Combining the base run on the farm level with the processing stage in Tirane (hence using this as a nationally representative dairy plant) reveals an overall small domestic profit for milk production in Albania. If we regard this as the most general figure within the dairy analysis, it shows that under current conditions, returns from milk production and processing are just barely positive. It follows directly from the earlier analysis at the farm level that lower opportunity costs and a higher milk productivity can increase this profit considerably.

The *resource cost ratios* (RCRs) for all five combinations were calculated by using the formula presented in section 0. It was hence necessary to divide all cost items into tradables and non-tradables. A difficulty arose from the question of how to deal with beef sales. Since no further data was available concerning the (potential) marketing channels for beef, this was assumed to be a non-tradable which lowers the costs of the other domestic resources. It was hence counted as a negative domestic factor cost. In the case of the zero wage scenario it therefore even overcompensated the costs of other domestic factors. Since a negative value would have made the RCR calculation inconsistent, we assumed a positive value close to zero for the domestic factors in this case.

The relation between domestic profit and RCR is such that a negative profit leads to a RCR below zero or above one. In the first case, the tradable value added is completely eaten up by the cost of tradables; in the second case, the value added does not suffice to pay the domestic resources. Accordingly, all RCRs except for the combination Tirane-Tirane are in the range between zero and one. Among these, the base run and the zero wage scenarios to some extent mark the extreme cases. The RCR of the base run scenario is close to one from below, which means that tradable revenue is just sufficient to cover domestic factor costs. On the other hand, the RCR of the zero wage scenario is close to zero from above, which means that the costs of domestic factors are much smaller than the tradable value added. In Table 13, separate rows show the contribution of the labour costs, both for farm family labour and hired labour at the processing level. Whereas the latter are more or less stable for both the Tirane and the Lushnje processor, the labour costs vary widely at the farm level. In the Tirane-Tirane case, they even exceed the tradable revenue. In all other cases except where they are assumed to be zero, they represent about half of the tradable revenue, and they usually (except for the Lushnje scenario) exceed the cost of tradables. A judgement concerning the opportunity costs of farm labour is hence crucial for an appropriate assessment of the competitiveness of dairy production in Albania. The lower these opportunity costs are, the more competitive is the dairy sector.

5 COMPETITIVENESS OF ALBANIAN WINE PRODUCTION

5.1 Introduction

In Albania, the geographical location and climatic conditions for wine production are very favourable. As a mediterranean country with a great variation of climates and well-suited micro-climates in the hill-country and mountainous valleys, the cultivation of wine has a long tradition. The conditions are suitable for a number of established and internationally traded wines, as well as for some autochthone varieties.

In 1955, the establishment of 10 thousand ha of vineyards was the basis for a rapid growth of the wine industry. At its peak, over 90 thousand tons of grape were produced in 1990 on 17,000 ha of vineyards (MECO, 2003).

The reforms of the 1990s have left severe damages to vineyard production. The majority of privatised vineyards were abandoned, so that there were only 4,300 ha remaining. The state-owned sapling producers were completely destroyed and part of the grape varieties were lost. Since 1997, the sector is going through a revival period. Under the conditions of prevailing land fragmentation, farmers have rediscovered labour-intensive viticulture as a profitable farming activity and until 2001, the quantity of grapes produced had more than doubled and nearly reached the levels of 1990 again, while the demand on the domestic market is still rising. The areas of new vineyard plantations per year have increased threefold from 2000 to 2001 (MECO, 2003).

5.2 Economic environment of wine production

5.2.1 Policies and legal framework

After the interruptions in the first period of transition, the Albanian government now starts to recognise the need for a regulative framework in which the national wine industry can develop. After 1999, a number of legal documents have been approved that aim at a prescription of quality standards for wine production and a protection and development of national grape varieties (KONGOLI and ZIGORI, 2002). Among the notable documents are the regulation No. 505 dating from 21 September 1999 which sets quality standards for wine products in conformity with EU standards, and the law No. 8443 dating from 21 January 1999 which establishes rules for the certification of grapes, quality standards, and aims at the set-up of a wine cadastre. Some work has also been done on developing an alimentary codex for wine products. It is however unclear how far these regulations are affecting actual practice. The wine cadastre has not been implemented yet and the use of forged declarations of origin appears to be commonly occurring (KONGOLI and ZIGORI, 2002, p. 4).

MoAF is currently setting up a new strategy for the wine sector and revising the legal framework for wine production, processing and marketing.

5.2.2 Domestic supply of grapes and wine

Domestic production of grapes has not yet fully reached its 1990 volume. However, there has been a steady increase over recent years, where production has been almost equally divided between vineyard and pergola grape production (Table 14). Between 1990 and 2000, the yield of vineyard production has increased by factor 4.

Table 14: Production of grapes 1990-2001

Production	Years						
	1990	**1994**	**1997**	**1998**	**1999**	**2000**	**2001**
Vineyard							
Total plant.surface (ha)	17261	5056	4719	5029	5377	5824	6275
In production (ha)	14058	4545	4121	4306	4380	4613	4878
Yield (ton/ha)	1.89	3.63	5.20	6.59	6.60	7.05	8.30
Pergola							
Total (000 plants)	6083	3262	4349	4261	4366	4638	4793
In prod. (000 plants)	5571	2867	3665	3497	3706	3856	3945
Yield (kg/plant)	–	9.6	12.2	11.0	11.0	11. 9	11.3
Total grape prod. (ton)	91000	44000	67500	68300	70400	79300	85100

Source: MECO, 2003, p. 4, based on official statistics.

The industrial production of wine was subject to some fluctuations in the post-1990 period. However, it reached a new maximum in 2001 (Table 15).

Table 15: Industrial production of wine

	1992	**1994**	**1999**	**2000**	**2001**
Wine production (hl)	11,781	9,640	12,708	7,413	14,228

Source: MOAF, 2002b, p. 47.

5.2.3 Foreign trade

During the socialist period, exports went to England and several Eastern European countries. The exported wines included Merlot, Shesh, Riesling, Sweet Wine Malaga, and Rozafa, as well as Scanderbeg cognac (KONGOLI and ZIGORI, 2002).

The export of wine broke down after 1990, particularly due to its poor quality, so that there is currently no significant export of wine (KONGOLI and ZIGORI, 2002, p. 8). At the same time, Albania is a net importer of wine. In 2001, 4,027 hl of wine were imported, which was worth 103.83 mln leke or 742 thousand € (= 0.4 per cent of all imported processed food products) (MoAF, 2002b, p. 55).

5.3 Structure of the sector

5.3.1 Primary production

After the dissolution of collective farming, grapes are now primarily produced by small-scale farms. Different production systems are dominant in the distinct geographical locations. In the coastal plains, vineyard production is dominant, while in the mountain areas pergola production is well-suited. Autochthone varieties with a certain economic importance include Shesh, Kallmet, Debine, Serin and Vlosh (MECO, 2003).

Major drawbacks of the development of viticulture are the fragmentation of land ownership, limited financial resources and difficult access to equipment.

Potential for improvement of the sector lies in the identification of suitable cultivars on the basis of their adaptation to different areas and the support of viticulture in all traditional production regions including hilly and mountainous areas (MECO, 2003).

5.3.2 Saplings production

Along with the increase of vineyard production in the 1960, the facilities for the production of saplings were established. The production of the 8 biggest state-owned sapling producers was 6-8 million saplings. During the reforms of the 1990s, all these enterprises were destroyed. Some 15 private companies have recently taken up local saplings production, reaching a production of about 500 thousand pieces per year. This satisfies only about 20 per cent of the demand for new plantations, the remaining part is still satisfied by imports, coming mainly from Italy (MECO, 2003).

5.3.3 Input supply and services

Slow development of the wine sector is partly due to a lacking access to inputs and services. Farmers have only limited financial resources and equipment, credit is difficult to obtain. Therefore, little investment has been carried out on irrigation and drainage facilities as well as erosion control systems. Equipment and intermediate inputs are subject to import tariffs, which raises prices for farmers. Scientific support of wine production is currently on a low level (MECO, 2003, p. 6).

5.3.4 Processing industry

During socialism, wine was produced in three main wineries in Durres, Tirane, and Shkoder. Along with the smaller wineries spread throughout the country, these were privatised after 1991. Due to the sharp decrease of grape supply, processing capacities were substantially cut down, and existing ones had to rely on imported grapes from neighbouring countries. Emerging private wineries were usually managed by the former staff of the state companies.

Today, there are two types of processing units (KONGOLI and ZIGORI, 2002, pp. 10-13):

- There are still many farm-based small-scale wineries existing throughout the country. However, products are partly sold in inadequate plastic bottles and containers.
- Small- to medium-sized private wineries gain increasing importance, which partly use imported equipment from Italy. Between 1992 and 2001, more than 21 of these had been established, with a processing capacity of 50 to 200 t of grapes and a filling capacity of 300 to 900 hl.

Subsistence production and informal trade of wine are assumed to play a major role in the Albanian wine market, although no specific data on this is available.

5.3.5 Quality issues

In the course of transition, Albania's wine industry suffered severely from a lack of a reliable labelling system for wine origins and appellations. Furthermore, wines produced in small-scale handcraft equipment and bottled in (partly used) plastic containers failed to meet conventional quality standards. Forged labels, the absence of any quality control scheme, the destruction of control laboratories and the removal of qualified staff from privatised wineries led to a strong decline of Albanian quality wine production in the 1990s (KONGOLI and ZIGORI, 2002, p. 11). Only after 1999, new wine quality legislation laid the basis for an improvement of the situation (see section 0).

5.3.6 Marketing

The main reasons for the revival of vineyard production are the increased demand of the domestic market and the development of the processing industry. Pergola production has also increased significantly, but it is not so relevant for the formal market since a large part of the production is for home consumption. The use of modern varieties and technologies have already had an important impact on the development of output quantities, and there is thought to be a large potential for further yield increases. The quality of grape and wine production is increasing, although there remains a lot of room for further improvements. Still, Albanian wines have a good reputation in the domestic market, and demand is increasing, although prices are starting to decline because of increasing competition (MECO, 2003).

5.4 Farm level profitability

The analysis in the following sections is similarly structured as the sections on milk production. We start with an analysis of the farm level, including several scenario calculations, and continue with investigating the processing level and the overall wine chain.

5.4.1 Base run: productivity, cost structure, and profitability

Table 16 presents the key assumptions concerning a typical grape grower in a nationwide view. As before, the assumptions were derived from a statistical analysis of the survey data and reflect a median farm in the overall sample, consisting of 60 farms in the regions of Elbasan, Kucove, Lushnje, Permet, and Tirane. Due to a lack of data on pergola grapes, only grape production from vineyards is considered. To summarise the most important figures, the typical farm has a vineyard of 0.5 ha with an average yield of 7,800 kg/ha and receives a grape price of 63 leke/kg. The opportunity cost of family labour is again assumed to be at 70 leke/hour (or 0.50 € per hour). Detailed data sheets on which the following calculations are based can be found in the Annexes.

Table 16: Key data on typical grape grower (base run)

Major outputs and prices		
Grape yield	kg/ha	7,800
Grape price	leke/kg	63
	€/kg	0.45
Major inputs and prices		
Vineyard	ha	0.5
Labour	hours/ha	4,680
Wage (opportunity costs of labour)	leke/hour	70
	€/hour	0.50

Source: Survey data, authors' calculations.

Cost structure and profitability of the typical grape grower are presented in Table 17. The figures are given on a per ha basis. The revenue consists of grape sales. The most important cost component is family labour, followed by vineyard depreciation. The latter reflects farmers' statements on their annual expenses for planting vines and is of considerable importance due to the recent interest in renewing vineyards. 'Buildings & machinery' include depreciation and maintenance, 'intermediate inputs' include primarily service charges for land preparation, furthermore machinery and fertiliser costs (see Annex 3). Owned land and capital are assumed to have zero opportunity costs.

Table 17: Cost structure and profitability of grape production (base run)

Revenue	**Leke/ha**	**€/ha**
Grapes	491,400	3,510
Total revenue [A]	**491,400**	**3,510**
Costs		
Intermediate inputs	50,800	363
Vineyard depreciation	116,000	829
Buildings & machinery	8,000	57
Labour	327,600	2,340
Total costs [B]	**502,400**	**3,589**
Profit [A]-[B]	**-11,000**	**-79**

Source: Survey data, authors' calculations.

Given these assumptions, the typical grape grower is loss-making, generating an annual loss of 11,000 leke or 79 € per ha.

5.4.2 Scenario calculations

To check the robustness of the results for the typical farm presented above, the following six scenarios were calculated:

1. Zero opportunity costs for family labour (wage=0).
2. Grape productivity increase by ten per cent at constant costs (+10 per cent grapes).
3. Typical grape grower for the region of Tirane.
4. Typical grape grower for the region of Lushnje.
5. Typical grape grower for the region of Kucove.
6. Typical grape grower for the region of Permet.

In the first two scenarios, single assumptions of the base run were modified. In the first scenario, the opportunity cost for family labour was set to zero, whereas all other assumptions remained in place. Similarly, in the second scenario, only the grape productivity was changed. As for the milk sector, the zero wage scenario was aimed to reflect different off-farm employment opportunities and the productivity increase the effects of a spread of technical knowledge in grape production.

The results of the first two scenarios are given in Table 18. As was to be expected, profitability in both scenarios increased, so that positive figures are the result. In the zero wage scenario, profit reaches a value of about 316,000 leke/ha or 2,261 €/ha, and 38,000 leke/ha or 272 €/ha in the productivity increase scenario. By these figures, grape production can be an economically viable activity in a national comparison. For example, in the zero wage scenario, the typical vineyard of 0.5 ha requiring 2,340 hours of labour input yields about 85 per cent of the Albanian gross domestic product per capita. However, the results also underline that the attractiveness of grape production critically hinges on the alternative employment opportunities of the farm labour force.

Table 18: Cost structure and profitability of grape production (scenarios 1 & 2)

Scenario	Base run	Wage=0	+10% grapes	Wage=0	+10% grapes
		Leke/ha		€/ha	
Revenue					
Grapes	491,400	491,400	540,540	3,510	3,861
Total revenue [A]	**491,400**	**491,400**	**540,540**	**3,510**	**3,861**
Costs					
Intermediate inputs	50,800	50,800	50,800	363	363
Vineyard depreciation	116,000	116,000	116,000	829	829
Buildings & machinery	8,000	8,000	8,000	57	57
Labour	327,600	0	327,600	0	2,340
Total costs [B]	**502,400**	**174,800**	**502,400**	**1,249**	**3,589**
Profit [A]-[B]	**-11,000**	**316,600**	**38,140**	**2,261**	**272**

Source: Survey data, authors' calculations.

The third to sixth scenarios aim to depict the situation given in certain regions more accurately (see map in Annex 1). A sufficient database was available for the regions of Tirane, Lushnje, Kucove, and Permet. In contrast to the first two scenarios, more of the assumptions of the base run were now changed. The key data is shown in Table 19.

Table 19: Typical grape growers in Tirane, Lushnje, Kucove, Permet

		Base run	Tirane	Lushnje	Kucove	Permet
Major outputs and prices						
Grape yield	kg/ha	7,800	6,000	15,000	18,333	6,167
Grape price	leke/kg	63	70	61	70	63
	€/ha	0.45	0.50	0.44	0.50	0.45
Major inputs and prices						
Vineyard	ha	0.5	0.5	0.2	0.6	0.6
Labour	hours/ha	4,680	8,800	8,450	3,900	2,383
Wage (opportunity costs of	leke/hour	70	70	70	70	70
	€/hour	0.50	0.50	0.50	0.50	0.50

Source: Survey data, authors' calculations.

The table illustrates that, compared with the base run, farms in Tirane and Permet realise slightly lower yields than the average, whereas in Lushnje and Kucove hectare yields are more than twice as high as in the base run. Compared with this, grape prices are slightly higher in Tirane and Kucove. Vineyard sizes are remarkably smaller in Lushnje. Also the reported labour intensity varies significantly between regions. Similar to the milk analysis, labour intensity in Tirane is quite high.

Table 20: Cost structure and profitability of grape production per ha (scenarios 3 to 6)

Scenario		Base run	Tirane	Lushnje	Kucove	Permet
Revenue						
Grapes	leke/ha	491,400	420,000	915,000	1,283,333	388,500
Total revenue [A]	leke/ha	**491,400**	**420,000**	**915,000**	**1,283,333**	**388,500**
Costs						
Intermediate inputs	leke/ha	50,800	93,200	160,000	750,833	66,000
Vineyard depreciation	leke/ha	116,000	84,000	360,000	116,000	116,000
Buildings & machinery	leke/ha	8,000	8,000	20,000	6,667	6,667
Labour	leke/ha	327,600	616,000	591,500	273,000	166,833
Total costs [B]	leke/ha	**502,400**	**801,200**	**1,131,500**	**1,146,500**	**355,500**
Profit [A]-[B]	leke/ha	**-11,000**	**-381,200**	**-216,500**	**136,833**	**33,000**
Revenue						
Grapes	€/ha	3,510	3,000	6,536	9,167	2,775
Total revenue [A]	€/ha	**3,510**	**3,000**	**6,536**	**9,167**	**2,775**
Costs						
Intermediate inputs	€/ha	363	666	1,143	5,363	471
Vineyard depreciation	€/ha	829	600	2,571	829	829
Buildings & machinery	€/ha	57	57	143	48	48
Labour	€/ha	2,340	4,400	4,225	1,950	1,192
Total costs [B]	€/ha	**3,589**	**5,723**	**8,082**	**8,189**	**2,539**
Profit [A]-[B]	€/ha	**-79**	**-2,723**	**-1,546**	**977**	**236**

Source: Survey data, authors' calculations.

Table 20 displays considerable differences in grape profitability per ha as a result of these regional adjustments of the data and also allows the explanation of the different yield figures in Tasble 19. Tirane and Permet show a broadly similar cost and revenue structure, with the only significant difference that labour intensity in Tirane is much higher. This results in a loss in Tirane, whereas the typical grape grower in Permet makes profits. Farms in Lushnje and Kucove achieve high yields and revenues, but for different reasons. Farmers in Lushnje operate very labour intensively, probably due to the smaller vineyards, and invest more in their plant material, as the high depreciation value shows. To the contrary, labour intensity and depreciation are low in Kucove, but farmers use much more intermediate inputs. Interestingly, total costs per ha are almost identical in both regions. However, since physical yields as well as grape prices in Lushnje are slightly lower than in Kucove, operations in Lushnje are loss-making whereas they are profitable in Kucove. Overall, Kucove and Permet show a comparative advantage in grape production. Although farms in Tirane and Lushnje appear to be loss-making by the presented calculations, this does not necessarily mean that they are illiquid. In both cases the accruing losses can be covered by an adjusted consumption behaviour, since opportunity costs of labour are of a calculative nature.

Table 21 shows grape profitability on a per ton basis. In this table, the unfavourable situation in Tirana becomes particularly visible, since high costs are coupled with a comparatively low productivity in this region.

Table 21: Cost structure and profitability of grape production per t raw grapes (sc. 3 to 6)

Scenario		Base run	Tirane	Lushnje	Kucove	Permet
Revenue						
Grapes	leke/t	63.00	70.00	61.00	70.00	63.00
Total revenue [A]	leke/t	**63.00**	**70.00**	**61.00**	**70.00**	**63.00**
Costs						
Intermediate inputs	leke/t	6.51	15.53	10.67	40.95	10.70
Vineyard depreciation	leke/t	14.87	14.00	24.00	6.33	18.81
Buildings & machinery	leke/t	1.03	1.33	1.33	0.36	1.08
Labour	leke/t	42.00	102.67	39.43	14.89	27.05
Total costs [B]	leke/t	**64.41**	**133.53**	**75.43**	**62.54**	**57.65**
Profit [A]-[B]	leke/t	**-1.41**	**-63.53**	**-14.43**	**7.46**	**5.35**
Revenue						
Grapes	€/t	0.45	0.50	0.44	0.50	0.45
Total revenue [A]	€/t	**0.45**	**0.50**	**0.44**	**0.50**	**0.45**
Costs						
Intermediate inputs	€/t	0.05	0.11	0.08	0.29	0.08
Vineyard depreciation	€/t	0.11	0.10	0.17	0.05	0.13
Buildings & machinery	€/t	0.01	0.01	0.01	0.00	0.01
Labour	€/t	0.30	0.73	0.28	0.11	0.19
Total costs [B]	€/t	**0.46**	**0.95**	**0.54**	**0.45**	**0.41**
Profit [A]-[B]	€/t	**-0.01**	**-0.45**	**-0.10**	**0.05**	**0.04**

Source: Survey data, authors' calculations.

5.5 Processing level cost structure and profitability

Similar to the milk sector, the data availability on the processing level did not allow such a differentiated analysis as for the farm level. Again, the input to output ratios reported for many processing companies turned out to be quite implausible, so that a strong bias in either input or output figures must be assumed. Only two companies, one in Ballsh and one in Korce, reported credible data on production activities. These formed the basis for the analysis presented in Table 22.

Table 22: Characteristics of grape processors Ballsh and Korce

	Ballsh	Korce	Ballsh	Korce
Production capacity hl/year	5,000	5,000		
Actual production hl/year	2,600	2,000		
Revenue	*Leke/ton raw grapes*		*€/ton raw grapes*	
Wine sales	163,800	154,667	1,170	1,105
Total revenue	**163,800**	**154,667**	**1,170**	**1,105**
Costs				
Grapes	60,000	42,000	429	300
Operational costs	5,500	6,667	39	48
Capital	9,900	10,617	71	76
Labour	4,020	27,520	29	197
Packaging	23,750	37,167	170	265
Information & marketing	2,534	1,800	18	13
Total costs	**105,704**	**125,770**	**755**	**898**
Profit per ton processed grapes	**58,096**	**28,897**	**415**	**206**
Return on sales %	**35**	**19**	**35**	**19**

Source: Survey data, authors' calculations.

The table allows an assessment of both the revenue and the cost structure of the two processing companies. Both companies are not producing at their full capacity, which is 5,000 hl for each processor. Overall, the revenue generated from one ton of processed grapes is slightly higher in Ballsh as compared with Korce.

Concerning the cost structure, the Korce processor pays less for grapes but displays higher labour and packaging costs. At the same time, expenses for information and marketing are lower. This results in an overall lower profit for the Korce processor, although both companies are operating highly profitable. The total profit per ton processed grapes is 58,000 leke or 415 € for Ballsh and 28,900 leke or 206 € for the Korce company. This is equivalent to a return on sales of 35 per cent for Ballsh and 19 for Korce. Contrary to the milk processors, the surveyed wine factories therefore operate profitable.

5.6 Domestic profitability and resource cost ratios

As for the milk chain, we investigate the competitiveness of the entire grape-wine chain encompassing the grape production and processing stages by an analysis of domestic profitability and resource cost ratios. A peculiarity of the grape-wine chain data is that processing companies report much lower grape prices paid to farmers than these have given in Table 19. The Ballsh company says it is paying 60 leke/kg on average, and the Korce company only 42 leke/kg, whereas farmers report sale prices for their grapes of 63 leke and more. These statements obviously do not fit. However, due to a lack of other data, we had to combine the figures for both stages, although the domestic profitability in this case cannot be a consistent aggregate of the reported profitability in the two stages. Instead, a decline of domestic profitability is to be expected.

In Table 23, we show regional grape-wine chains for combinations that seem still most plausible in terms of location of farmers vis-à-vis processors. We combine the base run as well as the farming stages of Tirane, Lushnje, and Kucove with the relatively centrally located processor in Ballsh and the Permet farm stage with the processor Korce, which is located in a neighbouring district. In all stages, nominal market prices were used. Only the sale prices for processed goods were net of VAT.

Table 23: Competitiveness of grape-wine production chain

Farm production		**Base run**	**Tirane**	**Lushnje**	**Kucove**	**Permet**
Processing		**Ballsh**	**Ballsh**	**Ballsh**	**Ballsh**	**Korce**
Domestic profit	leke/t raw grapes	-67,451	-136,574	-78,474	-65,577	13,248
Cost of domestic factors [A]	leke/t raw grapes	73,927	137,520	81,120	73,151	94,152
Of which farm family labour	leke/t raw grapes	42,000	102,667	39,433	14,891	27,054
Tradable revenue [B]	leke/t raw grapes	42,663	42,663	42,663	42,663	154,667
Cost of tradables [C]	leke/t raw grapes	36,187	41,717	40,017	35,090	47,267
Total costs [A]+[C]	leke/t raw grapes	110,114	179,237	121,137	108,240	141,419
Domestic profit	€/t raw grapes	-482	-976	-561	-468	95
Cost of domestic factors [A]	€/t raw grapes	528	982	579	523	673
Of which farm family labour	€/t raw grapes	300	733	282	106	193
Tradable revenue [B]	€/t raw grapes	305	305	305	305	1,105
Cost of tradables [C]	€/t raw grapes	258	298	286	251	338
Total costs [A]+[C]	€/t raw grapes	787	1,280	865	773	1,010
RCR [A]/([B]-[C])		11.42	145.36	30.66	9.66	0.88

Notes: For division into tradables and non-tradables see Annex 3. Major tradables at the farm level were fertiliser and concentrate, whereas labour was the major non-tradable. Tradables at the processing level were energy and packaging.

Source: Authors' calculations.

The table demonstrates that except for the last combination, all columns display huge *domestic losses* for the grape-wine chain. The Permet-Korce combination is the only chain which yields a positive profit of 13,200 leke or 95 € per ton of raw grapes. It holds for all other chains that either the profits of the processors reported in section 0 were overstated due to too low input costs or results concerning farm level production in section 0 still were too optimistic due to overstated sales prices. A third possibility is that the chains assumed to exist in Table 23 do not exist in reality and that farmers sell their grapes to other processors not covered in the analysis. In any case, the figures in the table report a robust loss for almost all chains ranging between 470 to 980 € per ton raw grapes. These losses generally cannot be offset by compensating them with opportunity costs of family labour, as a comparison of the loss with the values given in the row on the farm family labour cost component shows.

The *resource cost ratios* (RCRs) for all five combinations were calculated by using the formula presented in section 0.

As was to be expected given the domestic loss in the chains, all RCRs show values larger than one, indicating that tradable revenues do not suffice to cover the domestic factor costs. Only the Permet-Korce chain takes a value of 0.88, which implies that this is a competitive wine production chain.

6 CONCLUSIONS AND POLICY RECOMMENDATIONS

6.1 Milk production and processing

The results of the preceding analysis can be summarised as follows:

- Farm-level dairy production in Albania is characterised by small-scale, peasant farming systems based on extensive cattle grazing with little additional input. Only 12 per cent of the raw cow milk reaches the processing level, which itself consists of a range of processing units from many small, seasonally operating traditional cheese plants to few modern dairy plants.
- Albania currently is a net importer of milk. 93 per cent of consumer demand is met by domestic products and 7 per cent by imports.
- Only about half of the domestic raw milk production is sold on the market at all, and direct sales to consumers play a major role. Quality aspects are frequently ignored in milk marketing, and there is currently no strict health or quality legislation in force. However, consumers show an increasing consciousness of health-related issues. Whereas commercial dairy plants employ internal quality control systems, they face the drawback of high milk collection costs and the levying of VAT on their produce.
- Based on survey data from 40 dairy farms located in five different regions, the profitability and cost structure of these farms were analysed. The typical, specialised dairy farm in Albania keeps four cows which yield 2,900 kg milk per year and cow on average. Under the assumption of an opportunity cost of labour slightly above the wage for hired farm workers, the base run scenario showed that dairy farming is profitable, resulting in a profit of 34,200 leke or 244 € per cow, i.e. 12 leke or 0.08 € per kg milk.
- Opportunity costs of labour represent the most important cost component for dairy farmers. If these were zero, profits would increase about threefold. Productivity increases could also result in increased profits.
- A regionally differentiated analysis showed that, although milk prices are higher, dairy farming is less profitable in Tirane, mostly due to small herd sizes leading to a much higher labour intensity per cow than on the national average. To the contrary, herd sizes in Lushnje are larger, resulting in a comparative advantage for dairy farming in this region.
- Although hampered by less reliable data than on the farm level, the analysis of the processing stage showed that both dairy plants for which sufficient data was available were currently loss making. The loss is at 5,200 leke or 37 € per ton raw milk processed in Tirane and 23,000 leke or 165 € per ton in Lushnje. This results in a return on sales of –12 per cent in Tirane and –97 per cent in Lushnje.
- However, in an overall assessment of the entire production chain which does not take into account the distribution of revenue among the different production stages, dairy production in Albania is domestically profitable. This means that revenues achieved from the domestic sales of processed milk products are sufficient to cover all costs accruing throughout the entire production chain. Even so, if the overall typical farm and the Tirane processor are taken as a reference, the domestic profit is just barely positive. This is also reflected in an RCR of 0.94, which is still indicating the overall competitiveness of the sector but shows that the value of the domestic factors is close to the tradable value added.

- This result crucially depends on the assumptions one is willing to make about the opportunity cost of farm labour. If alternative employment opportunities for the farm population are actually not available, these opportunity costs go to zero, which considerably improves the domestic profitability and hence the competitiveness of dairy farming in Albania.
- If regional peculiarities are taken into account, domestic profit of the dairy chain becomes negative in the Tirane region, which is a consequence of the relatively low profitability of the farming level there. On the other hand, the more profitable farming operations in Lushnje can weigh up the loss-making performance of the dairy plant in that region.

Albania is currently not exporting any dairy products at all, to make any ultimate statement on the international competitiveness of the dairy sector therefore seems to be premature. Given the current structure of the sector, milk production and processing is a domestically profitable activity, so that potential export opportunities could be sought. However, the following impediments currently hamper the further development of the sector towards internationally competitive standards:

- Small farm and herd sizes limit the profitability of milk production and hence the efficiency of dairy farming, although regions differ in their comparative advantage with regard to dairy farming.
- Fragmented and dispersed production units increase the costs of milk collection.
- Processing in dairy plants is currently not profitable and the full capacity of plants is not utilised. Also the profitability of the entire milk chain seems to be not sufficient to attract further investment. Reasons for this might be the high share of informally traded milk products and the discrimination by the tax system.
- A high share of informal milk trade creates disincentives for any potential investors interested in the food industry. Without such investment no high-value marketing channels for farm products will emerge and commercialisation of agriculture will be inhibited. This in turn will hamper the adoption of specialised breeding material and more intensive milk production systems.
- Commercial processors are systematically disadvantaged by the VAT system currently in place, which excludes peasant farmers from VAT payments. There is no level playing field on the national market for milk products.
- International quality standards are by far not met. This is partially due to the high share of informally traded milk and the importance of direct sales to consumers.

Based on these findings, the following policy recommendations are given:

- In the medium run, harmonisation of quality and health standards with EU legislation should be further pursued. This is a prerequisite for any export of milk products, but would also make the domestic market more transparent and more reliable for raw milk producers. Requiring certain standards of production at the farm level would also stimulate the establishment of larger, more efficient and profitable farm structures, which in turn lower milk collection costs. Specifically targeted financial support and training programmes might however be necessary to enforce these standards.
- The tax system should not discriminate against commercially processed milk products. Current taxation inequitably favours farm level milk production. Although milk

production is domestically profitable, there is evidence that farmers' share in the overall value added is too large compared with the processing industry.

- It is therefore required to develop a medium-term strategy which enables the domestic processing industry to establish a solid standing in the market. For a transition period, this will necessitate to cut back currently existing advantages for informally trading farmers. At the same time, the government should ensure that farmers have access to sufficient knowledge and resources to react to these commercialisation processes.

We have stressed at several places the relevance of the opportunity costs of labour. The higher these costs, the lower the profitability and competitiveness of the Albanian dairy sector. This raises an important question concerning the future development of the Albanian economy. To the extent that non-agricultural industries develop in the country, these may induce an increasing demand for labour. In the course of structural transformation of the economy, the opportunity costs of farm labour may therefore increase, at least in certain urban centres. On the other hand, they may remain quite low in more remote areas. These inter-sectoral developments have a significant impact on the competitiveness of the dairy chain and should therefore be taken into account in any medium- to long-term planning.

6.2 Grape and wine production

The results of the previous grape-wine chain analysis can be summarised as follows:

- After the dissolution of the former large-scale collectives, grape production in Albania is currently dominated by small-scale vineyards cultivated by peasant farmers. Grapes are partly processed in farm-based handcraft wineries and partly sold to medium-sized processing companies.
- Although climatic conditions are favourable for wine production and autochthon varieties are available, there are currently no relevant exports of wine. Subsistence production and informal trade of wine are assumed to play a major role in the Albanian wine market, although no specific data on this is available.
- So far, Albanian wines do not meet international quality standards. At the same time, a legal framework regulating quality standards and labelling of wine is in the making. Also a commercially oriented national saplings production is emerging, after the former socialist saplings production facilities had been completely destroyed in the early 1990s.
- Based on survey data from 60 grape growers located in five different regions of Albania, the profitability and cost structure of these farms was analysed. The typical grape grower cultivates 0.5 ha of vineyards and achieved an annual yield of 7,800 kg/ha in the reporting period. Under the assumption of an opportunity cost of labour slightly above the wage for hired farm workers, the base run scenario showed that grape growing is loss-making, resulting in a loss of 11,000 leke or 79 € per ha.
- Opportunity costs of labour represent the most important cost component for grape growers. If these were zero, profits would become positive, about 316,600 leke or 2,261 € per ha.
- A regionally differentiated analysis displayed a rather heterogenous picture of grape production throughout the country. In the upshot, Kucove and Permet show a comparative advantage in grape production, primarily due to lower labour costs as a result of lower labour intensity. Due to a high level of intermediate input application,

yields in Kucove are significantly above those in other regions. Farms in Tirane and Lushnje are loss-making on average, although this again is largely due to the assumed opportunity cost of labour.

- Although hampered by less reliable data than on the farm level, the analysis of the processing stage showed that both wineries for which sufficient data was available were currently operating profitably. The profit is about 58,100 leke or 415 € per ton raw grapes processed in Ballsh and 28,900 leke or 206 € per ton in Korce. This results in a return on sales of 35 per cent in Ballsh and 19 per cent in Korce.
- A problem in the data was that we had only data for processors in regions different from those for which farm data was available. As a consequence, sale prices reported by farmers and purchase prices reported by processors differed. To enable the analysis of the entire chain we therefore had to combine farm-level and processing data from different regions, namely the base run farm level with Ballsh as well as Tirane-Ballsh, Lushnje-Ballsh, Kucove-Ballsh, and Permet-Korce. All chains except the last one resulted in substantial domestic losses for wine production. These losses generally cannot be offset by compensating them with opportunity costs of family labour. Only the Permet-Korce chain achieves a domestic profit of 13,200 leke or 95 € per ton raw grapes. The latter results in a RCR value of 0.88, which underlines the competitiveness of this chain.

Similar to milk, Albania currently does not export any wine. The critical profitability situation in most grape-wine chains suggests that exports to the highly contested European wine markets are difficult to imagine. However, an assessment of the situation based on the presented data has to be differentiated. If the two stages – farm level and processing – are analysed separately, the farm level is the one which actually reports losses in the national average and for two of the four regions in the study. Even so, significant cost shares in the analysis are due to depreciation and opportunity costs. Both of these cost components are at least partly calculative or imputed costs that do not affect the current liquidity position of the farmer. High depreciation values are partly due to high investment levels in recent years, which might still pay off in the years to come. As noted earlier, opportunity costs of family labour are difficult to determine and might in fact be lower in remote rural areas. A final judgement concerning the farm level is therefore premature. In general, increasing investment levels suggest that farmers expect to earn profits from grape production.

A further difficulty is due to the partly unsatisfactory data availability. Taken alone, the two processors in the study operate profitably. However, it is not clear whether there are farmers in the same regions who can produce grapes for the prices these processors report they are paying. The overall, domestic profit calculated above is becoming negative only for grape-wine chains that are constructed from different regions for the two stages, so that they are probably not existing in reality.

Overall, the structural preconditions for successful wine production in Albania seem to be better than for milk. There is evidence that farmers already started to invest in new plant material to improve their vineyards in recent years. The analysis showed that grape production at the farm level can be profitable, depending on regional conditions. Furthermore, quality and hygienic standards at the farm level are less crucial for grape production than they are in the dairy sector. In addition, although informal wine production and trade are a relevant phenomenon, there seems to be an increasing awareness of wine quality on the consumer side, partly stimulated by forged wine labels and inadequate quality and packaging standards in past years. However, an acceptable standard of wine quality can usually only be achieved by professional wineries, so that the importance of informal wine production and trade should

diminish in the future. In line with these considerations, the analysis of two processing companies showed that wine production can be a profitable activity in Albania. It seems that the government has also taken the right steps to improve the legal framework for wine quality and labelling standards.

Based on this assessment, the following policy recommendations are given:

- Further steps should be taken to enforce and improve the legal framework for quality standards and wine labelling. Harmonisation of quality standards with EU legislation should be further pursued. This is a prerequisite for any export activity and serves also as a safeguard for farmers who recently invested in grape production.
- Although investment levels have been picking up over recent years, private entrepreneurial initiative should be further encouraged by supporting knowledge and technology development both at the farm and processing stage. This seems to be particularly relevant in the areas of irrigation and drainage, erosion control, processing technology, and marketing. The government should make sure that both knowledge and technology are accessible for farmers and managers.
- Levels of intermediate input use currently differ significantly between regions. In the light of the diversity of economic outcomes at the farm level, an optimal adaptation of production technology to local conditions should be pursued. The government should ensure that accessible extension services for farmers are available. Scientific research on locally adapted grape production systems should be encouraged.
- Export opportunities for Albanian wine should be sought and the necessary legal preconditions should be created. This may include bilateral or multilateral trade negotiations with Balkan or EU trading partners.
- A final recommendation concerns both the milk and wine sector. The current study must be seen as a first attempt to quantify the current profitability and competitiveness of both sectors. However, throughout the entire analysis, it became clear that the available data is partly weak and the examination therefore remained in parts inconclusive. The Albanian government is advised to develop a solid database for assessing the profitability of farming and processing operations and subject this to regular analysis in order to allow a fine-tuning of its policies.

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ANNEXES

Annex 1: Map of Albania

Source: UNITED NATIONS, DEPARTMENT OF PUBLIC INFORMATION.

Annex 2: Data sheets milk sector

Table A 1: Typical farm data milk (leke)

	Unit	Base run	Wage=0	+10% milk	Tirane	Lushnje
Outputs						
No of milking cows	head(s)	4	4	4	2	7
Milk produced per cow	kg/year	2,900	2,900	3,190	2,900	2,700
Milk sold per cow	kg/year	2,400	2,400	2,400	2,400	2,400
Milk price	leke/kg	35	35	35	50	25
Cattle sold	heads	2	2	2	1	5
Cattle price	leke/head	50,000	50,000	50,000	50,000	50,000
Inputs						
Grazing/own produced fodder						
#Land	ha	1.5	1.5	1.5	0.5	1.5
#Opportunity costs of land	leke/ha	0	0	0	0	0
#Service charges land prepar.	leke/year	10,000	10,000	10,000	6,500	20,000
#Operational costs of machinery	leke/year	25,000	25,000	25,000	1,000	15,000
#Fertiliser Nitrate application	unit/year	2	2	2	1	2
#Fertiliser Nitrate price	leke/unit	2,200	2,200	2,200	2,200	2,200
#Fertiliser Urea application	unit/year	1	1	1	0	1
#Fertiliser Urea price	leke/unit	3,000	3,000	3,000	3,000	3,000
#Fertiliser Organic application	unit/year	15	15	15	1	15
#Fertiliser Organic price	leke/unit	100	100	100	100	100
#Fertiliser Phosphate application	unit/year	2	2	2	1	2
#Fertiliser Phosphate price	leke/unit	3,000	3,000	3,000	3,000	3,000
#Chemicals application	unit/year	0	0	0	0	0
#Chemicals price	leke/unit	6,000	6,000	6,000	6,000	6,000
Concentrate application	units/year	8	8	8	3	8
Concentrate price	leke/unit	2,300	2,300	2,300	2,300	2,300
Rented pastures	ha	0	0	0	0	0
Veterinary service charges	leke/year	5,500	5,500	5,500	3,000	5,500
Vaccinations	leke/year	1,250	1,250	1,250	500	1,250
Medication	leke/year	1,000	1,000	1,000	1,000	1,000
Water	leke/year	500	500	500	500	500
Electricity	leke/year	500	500	500	500	500
Materials	leke/year	500	500	500	500	500
Buildings						
#Annual depreciation	leke/year	2,500	2,500	2,500	2,500	2,500
#Annual maintenance	leke/year	1,250	1,250	1,250	1,000	1,250
Machinery						
#Annual depreciation	leke/year	10,000	10,000	10,000	500	10,000
#Annual maintenance	leke/year	5,000	5,000	5,000	500	5,000
Labour						
#Skilled labour	hours/year	3,900	3,900	3,900	4,000	3,200
#Skilled wage	leke/hour	70	0	70	70	70
Transport costs	leke/year	50	50	50	200	0

Source: Survey results, authors' calculations.

Table A 2: Typical farm data milk (€)

	Unit	Base run	Wage=0	+10% milk	Tirane	Lushnje
Outputs						
No of milking cows	head(s)	4	4	4	2	7
Milk produced per cow	kg/year	2,900	2,900	3,190	2,900	2,700
Milk sold per cow	kg/year	2,400	2,400	2,400	2,400	2,400
Milk price	€/kg	0.25	0.25	0.25	0.36	0.18
Cattle sold	heads	2	2	2	1	5
Cattle price	€/head	357.14	357.14	357.14	357.14	357.14
Inputs						
Grazing/own produced fodder						
#Land	ha	1.5	1.5	1.5	0.5	1.5
#Opportunity costs of land	€/ha	0	0	0	0	0
#Service charges land prepar.	€/year	71.43	71.43	71.43	46.43	142.86
#Operational costs of machinery	€/year	178.57	178.57	178.57	7.14	107.14
#Fertiliser Nitrate application	unit/year	2	2	2	1	2
#Fertiliser Nitrate price	€/unit	15.71	15.71	15.71	15.71	15.71
#Fertiliser Urea application	unit/year	1	1	1	0	1
#Fertiliser Urea price	€/unit	21.43	21.43	21.43	21.43	21.43
#Fertiliser Organic application	unit/year	15	15	15	1	15
#Fertiliser Organic price	€/unit	0.71	0.71	0.71	0.71	0.71
#Fertiliser Phosphate application	unit/year	2	2	2	1	2
#Fertiliser Phosphate price	€/unit	21.43	21.43	21.43	21.43	21.43
#Chemicals application	unit/year	0	0	0	0	0
#Chemicals price	€/unit	42.86	42.86	42.86	42.86	42.86
Concentrate application	units/year	8	8	8	3	8
Concentrate price	€/unit	16.43	16.43	16.43	16.43	16.43
Rented pastures	ha	0	0	0	0	0
Veterinary service charges	€/year	39.29	39.29	39.29	21.43	39.29
Vaccinations	€/year	8.93	8.93	8.93	3.57	8.93
Medication	€/year	7.14	7.14	7.14	7.14	7.14
Water	€/year	3.57	3.57	3.57	3.57	3.57
Electricity	€/year	3.57	3.57	3.57	3.57	3.57
Materials	€/year	3.57	3.57	3.57	3.57	3.57
Buildings						
#Annual depreciation	€/year	17.86	17.86	17.86	17.86	17.86
#Annual maintenance	€/year	8.93	8.93	8.93	7.14	8.93
Machinery						
#Annual depreciation	€/year	71.43	71.43	71.43	3.57	71.43
#Annual maintenance	€/year	35.71	35.71	35.71	3.57	35.71
Labour						
#Skilled labour	hours/year	3,900	3,900	3,900	4,000	3,200
#Skilled wage	€/hour	0.50	0.00	0.50	0.50	0.50
Transport costs	€/year	0.36	0.36	0.36	1.43	0.00

Source: Survey results, authors' calculations.

Table A 3: Profitability calculations farm-level milk (leke)

	Unit	Trada-bility	Base run	Wage=0	+10% milk	Tirane	Lushnje
Outputs							
Milk	leke/head	1.00	101,500	101,500	111,650	145,000	67,500
Carcasses	leke/head	0.00	25,000	25,000	25,000	12,500	35,714
Inputs							
Grazing/own produced fodder							
#Opportunity costs of land	leke/head	0.00	0	0	0	0	0
#Service charges land preparation	leke/head	0.50	2,500	2,500	2,500	3,250	2,857
#Operational costs of machinery	leke/head	0.50	6,250	6,250	6,250	500	2,143
#Fertiliser Nitrate costs	leke/head	1.00	1,100	1,100	1,100	770	629
#Fertiliser Urea costs	leke/head	1.00	750	750	750	450	429
#Fertiliser Organic costs	leke/head	0.00	375	375	375	25	214
#Fertiliser Phosphate costs	leke/head	1.00	1,500	1,500	1,500	1,050	857
#Chemicals costs	leke/head	1.00	0	0	0	0	0
Concentrate costs	leke/head	1.00	4,600	4,600	4,600	3,450	2,629
Rented pastures costs	leke/head	0.00	0	0	0	0	0
Veterinary service charges	leke/head	0.50	1,375	1,375	1,375	1,500	786
Vaccinations	leke/head	1.00	313	313	313	250	179
Medication	leke/head	1.00	250	250	250	500	143
Water	leke/head	1.00	125	125	125	250	71
Electricity	leke/head	1.00	125	125	125	250	71
Materials	leke/head	0.00	125	125	125	250	71
Buildings							
#Annual depreciation	leke/head	0.00	625	625	625	1,250	357
#Annual maintenance	leke/head	0.50	313	313	313	500	179
Machinery							
#Annual depreciation	leke/head	0.50	2,500	2,500	2,500	250	1,429
#Annual maintenance	leke/head	0.50	1,250	1,250	1,250	250	714
Labour							
#Labour costs	leke/head	0.00	68,250	0	68,250	140,000	32,000
Transport costs	leke/head	0.50	13	13	13	100	0
Profit per cow	leke/head		34,163	102,413	44,313	2,655	57,457

Source: Survey results, authors' calculations.

Table A 4: Profitability calculations farm-level milk (€)

	Unit	Trada-bility	Base run	Wage=0	+10% milk	Tirane	Lushnje
Outputs							
Milk	€/head	1.00	725.00	725.00	797.50	1,035.71	482.14
Carcasses	€/head	0.00	178.57	178.57	178.57	89.29	255.10
Inputs							
Grazing/own produced fodder							
#Opportunity costs of land	€/head	0.00	0.00	0.00	0.00	0.00	0.00
#Service charges land preparation	€/head	0.50	17.86	17.86	17.86	23.21	20.41
#Operational costs of machinery	€/head	0.50	44.64	44.64	44.64	3.57	15.31
#Fertiliser Nitrate costs	€/head	1.00	7.86	7.86	7.86	5.50	4.49
#Fertiliser Urea costs	€/head	1.00	5.36	5.36	5.36	3.21	3.06
#Fertiliser Organic costs	€/head	0.00	2.68	2.68	2.68	0.18	1.53
#Fertiliser Phosphate costs	€/head	1.00	10.71	10.71	10.71	7.50	6.12
#Chemicals costs	€/head	1.00	0.00	0.00	0.00	0.00	0.00
Concentrate costs	€/head	1.00	32.86	32.86	32.86	24.64	18.78
Rented pastures costs	€/head	0.00	0.00	0.00	0.00	0.00	0.00
Veterinary service charges	€/head	0.50	9.82	9.82	9.82	10.71	5.61
Vaccinations	€/head	1.00	2.24	2.24	2.24	1.79	1.28
Medication	€/head	1.00	1.79	1.79	1.79	3.57	1.02
Water	€/head	1.00	0.89	0.89	0.89	1.79	0.51
Electricity	€/head	1.00	0.89	0.89	0.89	1.79	0.51
Materials	€/head	0.00	0.89	0.89	0.89	1.79	0.51
Buildings							
#Annual depreciation	€/head	0.00	4.46	4.46	4.46	8.93	2.55
#Annual maintenance	€/head	0.50	2.24	2.24	2.24	3.57	1.28
Machinery							
#Annual depreciation	€/head	0.50	17.86	17.86	17.86	1.79	10.21
#Annual maintenance	€/head	0.50	8.93	8.93	8.93	1.79	5.10
Labour							
#Labour costs	€/head	0.00	487.50	0.00	487.50	1,000.00	228.57
Transport costs	€/head	0.50	0.09	0.09	0.09	0.71	0.00
Profit per cow	€/head		244.02	731.52	316.52	18.96	410.41

Source: Survey results, authors' calculations.

Table A 5: Profitability calculations processing-level milk (leke per t raw milk)

	Unit	Tradability	Tirane	Lushnje
Outputs				
Yoghurt	leke/t	1.00	23,332	2,441
Pasteurised milk	leke/t	1.00	17,143	3,107
Butter	leke/t	1.00	782	355
Youghurt sauce	leke/t	1.00	1,323	62
White cheese	leke/t	1.00	0	17,758
Curd	leke/t	1.00	0	16
Total revenue	leke/t		42,580	23,739
Inputs				
Raw milk	leke/t		30,000	31,000
Transport	leke/t	1.00	3,000	1,000
Capital depreciation	leke/t	0.00	485	5
Capital maintenance	leke/t	0.00	0	74
Labour skilled	leke/t	0.00	1,410	1,598
Labour unskilled	leke/t	0.00	3,100	2,603
Operational costs				
#Fuel	leke/t	1.00	2,348	53
#Water	leke/t	1.00	470	8
#Electricity	leke/t	1.00	313	9
#Services	leke/t	0.00	78	4
#Quality control	leke/t	0.00	16	0
Packaging costs	leke/t	1.00	6,575	10,419
Annual profit	leke/t		-5,214	-23,032
Return on sales	%		-12.25	-97.02

Source: Survey results, authors' calculations.

Table A 6: Profitability calculations processing-level milk (€ per t raw milk)

	Unit	Tradability	Tirane	Lushnje
Outputs				
Yoghurt	€/t	1.00	166.66	17.44
Pasteurised milk	€/t	1.00	122.45	22.19
Butter	€/t	1.00	5.59	2.54
Youghurt sauce	€/t	1.00	9.45	0.44
White cheese	€/t	1.00	0.00	126.84
Curd	€/t	1.00	0.00	0.11
Total revenue	€/t		304.14	169.56
Inputs				
Raw milk	€/t		214.29	221.43
Transport	€/t	1.00	21.43	7.14
Capital depreciation	€/t	0.00	3.46	0.04
Capital maintenance	€/t	0.00	0.00	0.53
Labour skilled	€/t	0.00	10.07	11.41
Labour unskilled	€/t	0.00	22.14	18.59
Operational costs				
#Fuel	€/t	1.00	16.77	0.38
#Water	€/t	1.00	3.36	0.06
#Electricity	€/t	1.00	2.24	0.06
#Services	€/t	0.00	0.56	0.03
#Quality control	€/t	0.00	0.11	0.00
Packaging costs	€/t	1.00	46.96	74.42
Annual profit	€/t		-37.24	-164.51
Return on sales	%		-12.25	-97.02

Source: Survey results, authors' calculations.

Annex 3: Data sheets wine sector

Table A 7: Typical farm data grape production base run and scenarios 1 & 2 (leke)

	Unit	Base run	Wage=0	+10% grapes
Outputs				
Vineyards	ha	0.5	0.5	0.5
Grape output	kg/year	3,900	3,900	4,290
Grape price	leke/kg	63	63	63
Inputs				
Opportunity costs of land	leke/ha	0	0	0
Service charges land preparation	leke/year	15,000	15,000	15,000
Operational costs of machinery	leke/year	1,000	1,000	1,000
Operational costs of irrigation	leke/year	1,500	1,500	1,500
Fertiliser Nitrate application	unit/year	1	1	1
Fertiliser Nitrate price	leke/unit	2,000	2,000	2,000
Fertiliser Urea application	unit/year	1	1	1
Fertiliser Urea price	leke/unit	3,600	3,600	3,600
Fertiliser Organic application	unit/year	0	0	0
Fertiliser Organic price	leke/unit	2,000	2,000	2,000
Fertiliser Phosphate application	unit/year	1	1	1
Fertiliser Phosphate price	leke/unit	2,200	2,200	2,200
Fertiliser DAP application	unit/year	0	0	0
Fertiliser DAP price	leke/unit	0	0	0
Chemicals application	unit/year	0	0	0
Chemicals price	leke/unit	800	800	800
Irrigation	leke/year	0	0	0
Pruning	leke/year	0	0	0
Hoeing	leke/year	0	0	0
Water	leke/year	0	0	0
Electricity	leke/year	0	0	0
Vineyard depreciation	leke/year	58,000	58,000	58,000
Buildings				
#Annual depreciation	leke/year	2,000	2,000	2,000
#Annual maintenance	leke/year	1,000	1,000	1,000
Machinery and irrigation				
#Annual depreciation	leke/year	500	500	500
#Annual maintenance	leke/year	500	500	500
Labour				
#Skilled labour	hours/year	2,340	2,340	2,340
#Skilled wage	leke/hour	70	0	70
Transport costs	leke/year	100	100	100

Source: Survey results, authors' calculations.

Table A 8: Typical farm data grape production base run and scenarios 1 & 2 (€)

	Unit	Base run	Wage=0	+10% grapes
Outputs				
Vineyards	ha	0.5	0.5	0.5
Grape output	kg/year	3,900	3,900	4,290
Grape price	€/kg	0.45	0.45	0.45
Inputs				
Opportunity costs of land	€/ha	0	0	0
Service charges land preparation	€/year	107.14	107.14	107.14
Operational costs of machinery	€/year	7.14	7.14	7.14
Operational costs of irrigation	€/year	10.71	10.71	10.71
Fertiliser Nitrate application	unit/year	1	1	1
Fertiliser Nitrate price	€/unit	14.29	14.29	14.29
Fertiliser Urea application	unit/year	1	1	1
Fertiliser Urea price	€/unit	25.71	25.71	25.71
Fertiliser Organic application	unit/year	0	0	0
Fertiliser Organic price	€/unit	14.29	14.29	14.29
Fertiliser Phosphate application	unit/year	1	1	1
Fertiliser Phosphate price	€/unit	15.71	15.71	15.71
Fertiliser DAP application	unit/year	0	0	0
Fertiliser DAP price	€/unit	0	0	0
Chemicals application	unit/year	0	0	0
Chemicals price	€/unit	5.71	5.71	5.71
Irrigation	€/year	0	0	0
Pruning	€/year	0	0	0
Hoeing	€/year	0	0	0
Water	€/year	0	0	0
Electricity	€/year	0	0	0
Vineyard depreciation	€/year	414.29	414.29	414.29
Buildings				
#Annual depreciation	€/year	14.29	14.29	14.29
#Annual maintenance	€/year	7.14	7.14	7.14
Machinery and irrigation				
#Annual depreciation	€/year	3.57	3.57	3.57
#Annual maintenance	€/year	3.57	3.57	3.57
Labour				
#Skilled labour	hours/year	2,340	2,340	2,340
#Skilled wage	€/hour	0.50	0.00	0.50
Transport costs	€/year	0.71	0.71	0.71

Source: Survey results, authors' calculations.

Table A 9: Typical farm data grape production scenarios 3 to 6 (leke)

	Unit	Tirane	Lushnje	Kucove	Permet
Outputs					
Grape output	kg/year	3000	3000	11000	3700
Grape price	leke/kg	70	61	70	63
Inputs					
Vineyards	ha	0.5	0.2	0.6	0.6
Opportunity costs of land	leke/ha	0	0	0	0
Service charges land preparation	leke/year	20000	15000	15000	4000
Operational costs of machinery	leke/year	1000	1000	1000	1000
Operational costs of irrigation	leke/year	2500	500	8000	1500
Fertiliser Nitrate application	unit/year	0	2	0	0
Fertiliser Nitrate price	leke/unit	2000	2000	2000	2000
Fertiliser Urea application	unit/year	3	1	2	1
Fertiliser Urea price	leke/unit	3000	3600	2800	3600
Fertiliser Organic application	unit/year	50	0	100	2
Fertiliser Organic price	leke/unit	100	2000	4000	2000
Fertiliser Phosphate application	unit/year	0	1	4	0
Fertiliser Phosphate price	leke/unit	2200	2200	2200	2200
Fertiliser DAP application	unit/year	2	0	0	1
Fertiliser DAP price	leke/unit	4500	0	0	5400
Chemicals application	unit/year	0	7	0	0
Chemicals price	leke/unit	800	800	800	800
Irrigation	leke/year	0	0	0	20000
Pruning	leke/year	0	0	0	0
Hoeing	leke/year	0	0	0	0
Water	leke/year	0	0	0	0
Electricity	leke/year	0	0	12000	0
Vineyard depreciation	leke/year	42000	72000	69600	69600
Buildings					
#Annual depreciation	leke/year	2000	2000	2000	2000
#Annual maintenance	leke/year	1000	1000	1000	1000
Machinery and irrigation					
#Annual depreciation	leke/year	500	500	500	500
#Annual maintenance	leke/year	500	500	500	500
Labour					
#Skilled labour	hours/year	4400	1690	2340	1430
#Skilled wage	leke/hour	70	70	70	70
Transport costs	leke/year	100	100	100	100

Source: Survey results, authors' calculations.

Table A 10: Typical farm data grape production scenarios 3 to 6 (€)

	Unit	Tirane	Lushnje	Kucove	Permet
Outputs					
Grape output	kg/year	3000	3000	11000	3700
Grape price	€/kg	0.50	0.44	0.50	0.45
Inputs					
Vineyards	ha	0.5	0.2	0.6	0.6
Opportunity costs of land	€/ha	0.00	0.00	0.00	0.00
Service charges land preparation	€/year	142.86	107.14	107.14	28.57
Operational costs of machinery	€/year	7.14	7.14	7.14	7.14
Operational costs of irrigation	€/year	17.86	3.57	57.14	10.71
Fertiliser Nitrate application	unit/year	0	2	0	0
Fertiliser Nitrate price	€/unit	14.29	14.29	14.29	14.29
Fertiliser Urea application	unit/year	3	1	2	1
Fertiliser Urea price	€/unit	21.43	25.71	20.00	25.71
Fertiliser Organic application	unit/year	50	0	100	2
Fertiliser Organic price	€/unit	0.71	14.29	28.57	14.29
Fertiliser Phosphate application	unit/year	0	1	4	0
Fertiliser Phosphate price	€/unit	15.71	15.71	15.71	15.71
Fertiliser DAP application	unit/year	2	0	0	1
Fertiliser DAP price	€/unit	32.14	0.00	0.00	38.57
Chemicals application	unit/year	0	7	0	0
Chemicals price	€/unit	5.71	5.71	5.71	5.71
Irrigation	€/year	0.00	0.00	0.00	142.86
Pruning	€/year	0.00	0.00	0.00	0.00
Hoeing	€/year	0.00	0.00	0.00	0.00
Water	€/year	0.00	0.00	0.00	0.00
Electricity	€/year	0.00	0.00	85.71	0.00
Vineyard depreciation	€/year	300.00	514.29	497.14	497.14
Buildings					
#Annual depreciation	€/year	14.29	14.29	14.29	14.29
#Annual maintenance	€/year	7.14	7.14	7.14	7.14
Machinery and irrigation		0.00	0.00	0.00	0.00
#Annual depreciation	€/year	3.57	3.57	3.57	3.57
#Annual maintenance	€/year	3.57	3.57	3.57	3.57
Labour					
#Skilled labour	hours/year	4400	1690	2340	1430
#Skilled wage	€/hour	0.50	0.50	0.50	0.50
Transport costs	€/year	0.71	0.71	0.71	0.71

Source: Survey results, authors' calculations.

Table A 11: Profitability calculations farm-level grapes base run and scenarios 3 to 6 (leke)

	Unit	Trada-bility	Base run	Tirane	Lushnje	Kucove	Permet
Outputs							
Hectare yield grapes	kg/ha		7,800	6,000	15,000	18,333	6,167
Grapes	leke/ha	1.00	491,400	420,000	915,000	1,283,333	388,500
Inputs							
Opportunity costs of land	leke/ha	0.00	0	0	0	0	0
Service charges land preparation	leke/ha	0.50	30,000	40,000	75,000	25,000	6,667
Operational costs of machinery	leke/ha	0.50	2,000	2,000	5,000	1,667	1,667
Operational costs of irrigation	leke/ha	0.00	3,000	5,000	2,500	13,333	2,500
Fertiliser Nitrate costs	leke/ha	1.00	4,000	0	20,000	0	0
Fertiliser Urea costs	leke/ha	1.00	7,200	18,000	18,000	9,333	6,000
Fertiliser Organic costs	leke/ha	0.00	0	10,000	0	666,667	6,667
Fertiliser Phosphate costs	leke/ha	1.00	4,400	0	11,000	14,667	0
Fertliser DAP costs	leke/ha	1.00	0	18,000	0	0	9,000
Chemicals costs	leke/ha	1.00	0	0	28,000	0	0
Irrigation	leke/ha	0.00	0	0	0	0	33,333
Pruning	leke/ha	0.00	0	0	0	0	0
Hoeing	leke/ha	0.00	0	0	0	0	0
Water	leke/ha	1.00	0	0	0	0	0
Electricity	leke/ha	1.00	0	0	0	20,000	0
Vineyard depreciation	leke/ha	0.00	116,000	84,000	360,000	116,000	116,000
Buildings							
#Annual depreciation	leke/ha	0.00	4,000	4,000	10,000	3,333	3,333
#Annual maintenance	leke/ha	0.50	2,000	2,000	5,000	1,667	1,667
Machinery							
#Annual depreciation	leke/ha	0.50	1,000	1,000	2,500	833	833
#Annual maintenance	leke/ha	0.50	1,000	1,000	2,500	833	833
Labour							
#Labour costs	leke/ha	0.00	327,600	616,000	591,500	273,000	166,833
Transport costs	leke/ha	0.50	200	200	500	167	167
Profit per ha	leke/ha		-11,000	-381,200	-216,500	136,833	33,000

Source: Survey results, authors' calculations.

Table A 12: Profitability calculations farm-level grapes base run and scenarios 3 to 6 (€)

	Unit	Trada-bility	Base run	Tirane	Lushnje	Kucove	Permet
Outputs							
Hectare yield grapes	kg/ha		7,800	6,000	15,000	18,333	6,167
Grapes	€/ha	1.00	3,510.00	3,000.00	6,535.71	9,166.66	2,775.00
Inputs			0.00	0.00	0.00	0.00	0.00
Opportunity costs of land	€/ha	0.00	0.00	0.00	0.00	0.00	0.00
Service charges land preparation	€/ha	0.50	214.29	285.71	535.71	178.57	47.62
Operational costs of machinery	€/ha	0.50	14.29	14.29	35.71	11.91	11.91
Operational costs of irrigation	€/ha	0.00	21.43	35.71	17.86	95.24	17.86
Fertiliser Nitrate costs	€/ha	1.00	28.57	0.00	142.86	0.00	0.00
Fertiliser Urea costs	€/ha	1.00	51.43	128.57	128.57	66.66	42.86
Fertiliser Organic costs	€/ha	0.00	0.00	71.43	0.00	4,761.91	47.62
Fertiliser Phosphate costs	€/ha	1.00	31.43	0.00	78.57	104.76	0.00
Fertliser DAP costs	€/ha	1.00	0.00	128.57	0.00	0.00	64.29
Chemicals costs	€/ha	1.00	0.00	0.00	200.00	0.00	0.00
Irrigation	€/ha	0.00	0.00	0.00	0.00	0.00	238.09
Pruning	€/ha	0.00	0.00	0.00	0.00	0.00	0.00
Hoeing	€/ha	0.00	0.00	0.00	0.00	0.00	0.00
Water	€/ha	1.00	0.00	0.00	0.00	0.00	0.00
Electricity	€/ha	1.00	0.00	0.00	0.00	142.86	0.00
Vineyard depreciation	€/ha	0.00	828.57	600.00	2,571.43	828.57	828.57
Buildings							
#Annual depreciation	€/ha	0.00	28.57	28.57	71.43	23.81	23.81
#Annual maintenance	€/ha	0.50	14.29	14.29	35.71	11.91	11.91
Machinery							
#Annual depreciation	€/ha	0.50	7.14	7.14	17.86	5.95	5.95
#Annual maintenance	€/ha	0.50	7.14	7.14	17.86	5.95	5.95
Labour							
#Labour costs	€/ha	0.00	2,340.00	4,400.00	4,225.00	1,950.00	1,191.66
Transport costs	€/ha	0.50	1.43	1.43	3.57	1.19	1.19
Profit per ha	€/ha		-78.57	-2,722.86	-1,546.43	977.38	235.71

Source: Survey results, authors' calculations.

Table A 13: Profitability calculations processing-level wine (leke per t raw grapes)

	Unit	Tradability	Ballsh	Korce
Outputs				
Wine	leke	1.00	163,800	154,667
Inputs				
Grapes	leke		60,000	42,000
Transport	leke	1.00	2,000	2,000
Buildings depreciation	leke	0.00	1,200	1,667
Buildings maintenance	leke	0.00	2,500	7,000
Machinery depreciation	leke	0.50	1,200	1,233
Machinery maintenance	leke	0.50	5,000	717
Labour skilled 1	leke	0.00	1,200	6,400
Labour skilled 2	leke	0.00	720	3,200
Labour unskilled	leke	0.00	2,100	17,920
Operational costs				
#Fuel	leke	1.00	1,250	2,000
#Water	leke	1.00	250	500
#Electricity	leke	1.00	250	333
#Services	leke	0.00	1,500	1,333
#Quality control	leke	0.00	250	500
Packaging costs	leke	1.00	23,750	37,167
Information&consulting	leke	0.50	2,500	1,733
Transport&marketing	leke	0.50	34	67
Annual profit	leke		58,096	28,897
Return on sales	%		35	19

Source: Survey results, authors' calculations.

Table A 14: Profitability calculations processing-level wine (€ per t raw grapes)

	Unit	Tradability	Ballsh	Korce
Outputs				
Wine	€	1.00	1,170.00	1,104.76
Inputs				
Grapes	€		428.57	300.00
Transport	€	1.00	14.29	14.29
Buildings depreciation	€	0.00	8.57	11.91
Buildings maintenance	€	0.00	17.86	50.00
Machinery depreciation	€	0.50	8.57	8.81
Machinery maintenance	€	0.50	35.71	5.12
Labour skilled 1	€	0.00	8.57	45.71
Labour skilled 2	€	0.00	5.14	22.86
Labour unskilled	€	0.00	15.00	128.00
Operational costs				
#Fuel	€	1.00	8.93	14.29
#Water	€	1.00	1.79	3.57
#Electricity	€	1.00	1.79	2.38
#Services	€	0.00	10.71	9.52
#Quality control	€	0.00	1.79	3.57
Packaging costs	€	1.00	169.64	265.48
Information&consulting	€	0.50	17.86	12.38
Transport&marketing	€	0.50	0.24	0.48
Annual profit	€		414.97	206.41
Return on sales	%		35	19

Source: Survey results, authors' calculations.

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