

# Competitiveness of Wine Production: The Case of Bosnia and Herzegovina

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## Wettbewerbsfähigkeit der Weinproduktion in Bosien und Herzegowina

### 1 Introduction

Bosnia and Herzegovina (B&H) is one of the poorest European countries (e.g. WORLD BANK, 1997). The war in B&H followed the declaration of independence from the former Yugoslavia at the end of 1991 and was halted after the signing of the Dayton Agreement in 1995. As a result of this Agreement, B&H is set up as a state composed of two Entities: the Federation of B&H, which is divided into 10 cantons, and Republika Srpska (RS). The war and later political and institutional instabilities have caused delays in reforms and transformation processes. The studies for B&H show a dramatic reduction in living standards and a

dramatic increase in poverty levels, with reliance on remittances from abroad, humanitarian assistance and foreign aid (e.g. WORLD BANK, 1998 and 1999). Although the reconstruction program achieved some recovery from the depressed economic situation, one of the key development issues for emerging out of the depression trap is to provide opportunities for economic growth, employment and income generation. The imports are growing rapidly, while among exports there are only few products. Among them is wine, which is analyzed in this article.

The research object of our analysis is wine grapes and wine production in B&H, mostly developed in the Federation of B&H in the cantons Neretva and Western Herze-

### Zusammenfassung

Der Ansatz der Politik-Analysenmatrix (PAM) sowie Indikatoren für vergleichende Handelsvorteile in der Trauben- und Weinproduktion wurden herangezogen, um die internationale Wettbewerbsfähigkeit von B & H in diesem Bereich beurteilen zu können. Günstige Klima- und Bodenverhältnisse sowie niedrige Preise bei den Produktionsfaktoren deuten auf eine gute internationale Wettbewerbsfähigkeit der Weinproduktion in B & H. Der heimische Pro-Kopf-Verbrauch ist relativ gering, andererseits birgt der Tourismus in der Hauptanbauregion von B & H eine exzellente Absatzmöglichkeit für bosnischen Wein. Wein aus B & H wird traditionellerweise exportiert. Durch eine zusätzliche Verbesserung der Produktionseffizienz, der Weinqualität und dem Marketing könnte der Weinsektor in B & H international wettbewerbsfähig werden.

**Schlagerworte:** Politikanalysenmatrix, Wettbewerbsfähigkeit, Handelsvorteile, Marketing, Wein.

### Summary

The Policy Analysis Matrix approach and the indicators of comparative trade advantages for grapes and wine production are used to evaluate the international competitiveness of the wine sector in Bosnia and Herzegovina (B&H). Favorable natural conditions and relatively low costs of non-tradable domestic factors provide opportunities for internationally competitive wine production. Domestic wine consumption per capita is relatively small, but tourism in the main winegrowing region of B&H provides excellent niche marketing opportunities for wines. Wine from B&H is traditionally exported. With further improvements in production efficiency, wine quality and marketing, the wine sector in B&H is expected to become internationally competitive.

**Key words:** Policy analysis matrix, competitiveness, trade advantages, marketing, wine tourism.

govina, where the specific micro-climatic conditions of the river Neretva near the town of Mostar are combined with the favorable weather conditions of the Adriatic coast. Wine production of the geographically original wines (brand names "Blatina" and "Zilavka") has a very long tradition as part of the history and culture of this region. During the last two decades, in the wine producing cañtons there has been emerging rapidly growing international tourism largely associated with the religious site of Medugorje. Besides religious tourism, other important branches are cultural and most recently rural, including wine tourism. The wine sector in B&H has experienced similar transition developments to those in some other Central and Eastern European (CEE) countries, but due to the war, transformation and restructuring processes have not yet been completed.

The focus of the empirical analysis is on investigation of international competitiveness of the wine sector in B&H. The methods applied include both the Policy Analysis Matrix (PAM) approach and the measures of comparative trade advantages.<sup>1</sup> From the PAM are derived the nominal and effective protection rates (NPR and EPR, respectively) and indicators of efficiency and international competitiveness (private cost ratio, domestic resource cost and social cost benefit ratio – PCR, DRC and SCBR, respectively). The revealed comparative trade advantage measures include applied relative export advantage, relative import penetration and relative trade advantage. These approaches have already been applied in the analysis of competitiveness of agricultural and food products in some other CEE countries (BOJNEC, 2001a and 2002).

The main contributions of this article that are of broader research and policy relevance are twofold. Firstly, this is the first study to deal with the questions of competitiveness and comparative trade advantages for the agri-food sector in B&H. Besides this pioneering analytical research work for B&H, the study also provides a basis for potential expansion of research to other products and sectors in B&H. Secondly, the article conveys the main policy implications regarding international competitiveness of wine grapes and wine production in B&H. As the most striking results, the wine price level as an indication of wine quality and efficiency in marketing is found to be the key factor in improving international competitiveness of wine grapes and wine production in B&H. The wine quality improvements are likely to be linked to technological, processing, bottling, organizational and management improvements. Wine prices are additionally related to marketing improvements, promotional activities and touristic development in the wine growing cantons.

The subsequent sections are structured in the following way. The second section presents the essential evidence on the wine sector balances in B&H in comparison with the world top wine producing and exporting countries. It provides comparisons on production and international trade in grapes and wines, and also draws attention to wine consumption and wine prices in B&H. The third section explains PAM and key indicators of comparative trade advantages. The fourth section presents and evaluates empirical results of PAM indicators, focusing on protection and international competitiveness measures and indicators of international comparative trade advantages for wine grapes and wine in B&H. The final section concludes by highlighting prospects for improving international competitiveness and wine marketing opportunities on domestic and export markets.

## 2 The Wine Sector in B&H

The size of the B&H wine sector compared to the top world wine producing countries is relatively small, and therefore B&H is not a substantial player in the world wine markets (Table 1). However, wine production in B&H is important for local development, employment and income generation in the wine growing areas in the cantons of Neretva and Western Herzegovina. The top world wine producers are France, Spain and Italy, which are also the greatest wine exporters. Chile, the United States of America (USA), and Italy are significant grape exporters.

As a whole, the European Union (EU) is the world's greatest wine producer, exporter and importer. The world wine production during the last years was between 270 and 290 million hectoliters and the area devoted to vineyards is 7.3–7.4 millions hectares (FAO, 2006). The world wine consumption lies between 220 and 240 million hectoliters. Wine consumption per capita in the world is the highest in Luxembourg and France, but there is a considerable decline in wine consumption in France and Italy.<sup>2</sup> The world trade in wines lies between 60 and 74 millions hectoliters, while the share of imported wines in wine consumption has increased to around 30 % (AIGRAIN, 1998). This pattern is consistent with consumers' preferences and their demands towards greater qualities and varieties. Wine export growth is recorded by Spain, Portugal, Germany, some overseas countries (South Africa, the USA, Chile, Argentina, and Australia), and some CEE countries (Hungary and Bulgaria). The world largest wine importers are Germany and the

Table 1: Major World Grapes and Wine Producers, and B&H, 2003  
 Tabelle 1: Hauptproduzenten für Trauben- und Wein im Vergleich mit B&H, 2003

	Grapes (1.000 metric tons)			Wine (10.000 hectoliters)		
	Production	Imports	Exports	Production	Imports	Exports
World	62,932.7	6,891.5	7,146.1	27,181.0	7,079.6	7,333.0
Argentina	2,370.0	3.9	223.9	1,322.5	0.3	193.1
Australia	1,496.9	85.4	82.2	1,019.4	16.5	536.6
B&H	21.8	5.7	0.1	7.6	3.7	3.5
Chile	2,125.0	7.5	1,135.1	668.1	0.5	391.0
France	6,307.1	359.2	162.9	4,735.3	492.5	1,517.7
Germany	1,119.0	749.5	54.3	828.9	1,253.0	288.1
Italy	7,482.9	353.9	817.7	4,408.6	146.0	1,390.2
South Africa	1,663.5	14.1	350.5	885.3	7.0	233.2
Spain	6,863.9	46.6	349.8	4,623.8	28.3	1,220.4
USA	5,962.7	759.2	1,042.0	2,350.0	616.8	333.9

Source: FAO (2006)

United Kingdom. Among important marketing channels for wines are supermarkets (e.g. in Denmark, Argentina and Greece), specialized shops (e.g. in Sweden) and food services (e.g. in Japan and Spain) (POMARICI, 1999). In some countries, such as Austria, wineries also play an important role in wine marketing.<sup>3</sup> The world wine surpluses amounted between 50 and 60 million hectoliters. They are most often used for distillations. Trade in wines is increasingly becoming more two-ways, thus more of an intra-industry type providing differentiation of wines for consumers and encouraging specializations and market segmentations by producers. The increasing preference in the world wine trade is directed to wine qualities.

While B&H is not a major player in the global grape and wine markets, its recovery in local grape production after

the war has been achieved by an increase in yields (Table 2). Wine production and particularly wine exports in B&H reflect instabilities, but wine imports have increased. The latter increase is related to the presence of foreigners on duties in the post-war B&H. They introduced the demand for high quality imported wines. With the economic declines in the 1980s and the war during the 1990s, wine consumption per capita in B&H declined. At the same time there was an increase in the consumption of beer, mineral and other waters and fruit juices, but also of high quality wines. Besides cultural, climatic and economic factors, there are also changes in consumers preferences due to health reasons. The low level of wine consumption in B&H at around 2 liters per capita is a result of the low purchasing power of the population, and of religious and cultural fac-

Table 2: Market Balances for the Wine Sector in B&H, 1998–2002  
 Tabelle 2: Kennzahlen für Wein in B&H, 1998–2002

	1998	1999	2000	2001	2002
Grapes production (1.000 kilograms)	12,804	12,723	13,247	13,300	13,400
Area under vineyards (hectares)	3,600	3,600	3,600	3,600	3,600
Yields of grapes per hectare (kg/ha)	3,557	3,635	3,680	3,694	3,722
Wine production (1.000 liters)	6,944	5,800	4,769	5,000	5,200
Wine exports (1.000 liters)	2,671	2,200	440	1,900	1,109
Wine imports (1.000 liters)	1,592	1,770	1,400	2,500	2,033
Available for consumption (1.000 liters)	5,866	5,370	5,729	5,600	6,124
Consumption per capita (liters)	2.09	1.91	2.05	1.98	2.16

Source: FAO (2003) and national statistical data

tors. Consumption of wine in B&H differs considerably by regions and cantons. In the cantons of Western Herzegovina and Neretva, where the local wine production is situated, wine consumption is the highest in B&H.

The relatively low level of wine consumption per capita in B&H is encouraging wineries to improve marketing for niche markets.<sup>4</sup> There are two main opportunities: new niches in domestic markets and new export markets. In the domestic markets, the combination of religious, wine and food tourism is one option.<sup>5</sup> The role of religious tourism in Medugorje in the canton of Neretva, and events such as wine tourism products in wine-growing areas, are a way to promote sales of geographically original wines, including a specially bottled wine as a souvenir from this fascinating region. These require the appropriate methods of managing the individual cellars and the establishment of wineries as tourist attractions, the prime motivators for traveling to this region, and also as a secondary activity linked to the religious, cultural and other tourism. There are also foreigners working and living in B&H. They should form another niche market targeting group. In the export markets, the search for new export markets seems a more difficult task than does exploring the opportunities in wine tourism in the domestic markets. In the international wine markets there is strong competition and, as a rule, international wine markets are protected against imports from third countries.

After the war, foreign trade in B&H was registered by two entities, the Federation of B&H and the RS, respectively. Each entity established its own custom office, which registered trade entering in B&H in the entity.<sup>6</sup> As there were no custom offices between the entities, accurate evidence on inter-entities trade did not exist. As there is almost no market-oriented wine production in RS, trade flows of domestically produced wines are from the Federation of B&H to RS. There might be also some circular flows of imported wines between the entities, which are not included in the trade statistics. It is likely that some trade did not pass

through the custom offices, and therefore the registered trade flows may have been underestimated. We present wine trade for the Federation of B&H, where domestic wine production is also situated in B&H (Table 3).

The post-war emergency and reconstruction processes in B&H are accompanied by an increase in wine imports. In 2001, there is the peak in the level of wine imports in the Federation of B&H, where Sarajevo is situated, the capital of B&H. These wine import trade developments seem to be associated with the presence of international missions in B&H, where imports of wine played an important role in diversification of wine offers toward broader consumer tastes and preferences. Unit c.i.f. import values varied around 3.15 Convertible Marks (KM) per liter (l), supposing that imported wines of higher quality are dedicated to consumers with special preferences and higher incomes. On the other hand, exports of wine from the Federation of B&H have declined more in quantity than in value terms. The level of exports in quantity terms in 2002 is around half of that in 1999. After the war in B&H, a large amount of table wines was for the first time exported from B&H to France. This impact is nicely depicted for the year 1999. Exports of wines from B&H to the EU are within a preferential quota, which is largely used for exports to Germany, where the Diaspora from B&H is also present. The quantity level of wine exports from B&H is reduced due to both supply and demand factors. On the supply side, there are internal bottlenecks and constraints in the wine sector, which needs restructuring. There is room for investment in the wine sector in B&H, which can be conducted by domestic investors, the Diaspora and other foreign direct investors. The delays in transformation and restructuring reforms postpone necessary investments for improvements in viticulture, wine cellars and wine processing, wine marketing and promotion. However, the unit export value has increased, indicating that higher wine qualities, particularly bottled wines, are being increasingly exported. In spite of

Table 3: Trade of Wine in Federation of B&H  
Tabelle 3: Handelskennzahlen für Wein in B&H

	Exports (1.000 l)	Value of exports (1.000 KM)	Unit export value (KM/l)	Imports (1.000 l)	Value of imports (1.000 KM)	Unit import value (KM/l)
1999	2,214.8	1,817.2	0.82	1,775.2	6,312.7	3.56
2000	1,254.5	1,575.4	1.26	2,062.2	5,858.2	2.84
2001	1,490.2	2,066.9	1.39	2,688.6	7,932.6	2.95
2002	1,109.2	1,802.5	1.62	2,033.1	6,619.5	3.26

Source: Custom Office of Federation of B&H (2003)

that, the average export unit value remains much lower than was the average import unit value. The main reason lies in wine quality and wine marketing. There is a need for considerable improvements at both the winery and particularly the institutional levels. Among important constraints hindering the sector and its international competitiveness are the absence of protection of geographical origin of autochthony wines and underdeveloped food quality controls in B&H. Without a guarantee of product quality for consumers, it is difficult to improve the wine image and marketing opportunities. The well developed geographical origin of autochthony wines can bring benefits to the local wine industry and emerging wine tourist destinations.

It is interesting to note that the winery "Ljubiški", which is one of the largest wineries in B&H, has contractual relations with foreign partners, thus contributing to stable year-to-year prices, which are fixed in Euro. This is clearly depicted in Table 4, which presents export wine prices achieved by the "Ljubiški" winery, which exports bottled wines of higher quality in 0.75 and 1.0 liter bottles. These prices are higher than the average export price of wine from B&H, and varied by geographical export markets and by three different exported brand names of wines («Žilavka», «Blatina», and «Merlot»). Most of these exports are directed to Germany and Croatia, and partly to Sweden. The Diaspora from B&H is an important niche outlet in these markets.

### 3 Methods applied and data used

To evaluate international competitiveness and relative trade advantages for wine grapes and wines in B&H, we apply two main methodological approaches: the Policy Analysis Matrix (PAM) approach, and indicators of relative trade advantages.

#### 3.1 Policy Analysis Matrix (PAM)

The PAM compares revenues, costs of traded intermediary inputs, costs of non-traded intermediary inputs and costs of primary domestic resources (land, labor, and capital), and profitability (the difference between the revenues and all costs) at private (domestic) and economic (social) prices<sup>7</sup> to evaluate policy-induced transfers (Table 5). The private (domestic) prices are the market prices in the country and the economic (social) prices are the shadow prices of the intermediary inputs and primary domestic resources and of the product concerned. The PAM assesses actual net benefits and net benefits in terms of opportunity costs. The difference between them represents net policy transfers resulting from government policies occurring in output, traded and non-traded intermediary inputs, and primary domestic resources. Our focus in the PAM structure is on investigating the indicators of protection (NPR and EPR) and the indicators of efficiency (SCBR, DRC, and PCR).

NPR greater than zero (0) percent indicates implicit nominal protection or subsidy to producer, and vice versa implicit nominal tax, when NPR is less than 0 percent. EPR greater than 0 percent implies effective protection of value-added by producers, and vice versa effective taxation of value added by producers, when EPR is less than 0 percent. When PCR is less than 1, but greater than 0, this implies that a certain product is competitive under distorted domestic market conditions, and when PCR is greater than 1 this implies that a product is not competitive under domestic market conditions. When SCBR and DRC are less than 1, but greater than 0, this implies internationally competitive production. By contrast, SCBR and DRC greater than 1 imply that a certain product is not competitive internationally. Moreover, when SCBR and DRC are less than 0, then this implies a very unprofitable, internationally loss-making activity.

Tradable inputs are traded internationally (e.g. fertilizers), while non-tradable inputs are mainly domestic prima-

Table 4: Export Prices of Bottled Wine (€)  
Tabelle 4: Exportpreise von Flaschenwein (€)

	Bottles of 0.75 liter							Bottles of 1.00 liter		
	Germany			Croatia			Sweden	Germany		
	Žilavka	Blatina	Merlot	Žilavka	Blatina	Merlot	Blatina	Žilavka	Blatina	Merlot
2000	1.35	1.35	1.55	1.8	2.05	1.55	2.05	1.55	1.55	1.8
2001	1.35	1.35	1.55	1.8	2.05	1.55	2.05	1.55	1.55	1.8
2002	1.35	1.35	1.55	1.8	2.05	1.55	2.05	1.55	1.55	1.8

Source: "Hepok-Winery Ljubiški" Ljubiški (2003)

Table 5: Policy Analysis Matrix (PAM), indicators of protection and efficiency  
 Tabelle 5: Politik-Analysen-Matrix (PAM), Indikatoren für Schutz und Effizienz

	Revenue	Costs of tradable inputs	Costs of domestic resources	Profitability
Private values	A	B	C	$D = A - B - C$
Economic values	E	F	G	$H = E - F - G$
Policy transfers	$I = A - E$	$J = B - F$	$K = C - G$	$L = D - H = I - J - K$
Indicators of protection and efficiency				
Formula				
Nominal protection rate .....	$NPR = [(A / E) - 1] * 100$		It compares private revenue to economic (social) revenue. It measures the impact of price, trade, and exchange rate policies on output price.	
Effective protection rate .....	$EPR = [((A-B)/(E-F)) - 1] * 100$		It compares value-added by producers measured in private and economic (social) terms.	
Social cost-benefit ratio .....	$SCBR = (F+G)/E$		The SCBR is a measure of economic (social) profitability. It compares cost of inputs and primary domestic resources in economic (social) terms with the gross value of foreign exchange earned.	
Domestic resource cost .....	$DRC = G/(E-F)$		The DRC is an indicator for measuring competitiveness of domestic production vis-à-vis foreign competition as it measures the relative efficiency of domestic production in terms of its international cost competitiveness. It compares the cost of using primary domestic resources with the net value of foreign exchange earned in economic (social) terms.	
Private cost ratio .....	$PCR = C/(A-B)$ or $G/(A-B)$		The PCR is defined as a ratio between the opportunity costs of primary domestic resources and non-traded intermediary inputs, and the value-added at private (domestic) prices. It compares the cost of using primary domestic resources in economic or in private terms with the value-added by producers measured in private terms.	

Source: Monke & Pearson (1989), Tsakok (1990) and Bojnec (2001a)

ry resources (land, labor and capital) (e.g. GITTINGER, 1982). In similar studies land and labor are typically taken as non-tradable inputs, although there might be some labor flows across the country boundaries. The costs of capital include two types of costs. On one side, this is amortization cost for remuneration of basic assets such as buildings and agricultural machinery, which as private costs are evaluated according to accountancy rules. However, the use of capital induces opportunity costs, as the capital can be used in any other economic activity or is borrowed from a bank or financial institution with associated interest rates. Due to the specific situation in B&H, the banking sector lacks competition and is underdeveloped, and the country faces financial risks that result in higher costs for the use of capital in the country than it is the case in well developed and open international capital markets. We assume that in the specific country situation, where there are constraints on the international capital flows, it is more appropriate to accept the assumption that capital used in agriculture and food processing in B&H is to a great extent as non-tradable inputs, largely biased to local financial and banking conditions. At the same time, we have conducted sensitivity analysis of our results at different levels of interest rates on used capital.<sup>8</sup>

For calculations of revenues and production costs at private (domestic) prices for the wine sector of B&H we use available statistical data, the accountancy evidence obtained from the five largest wineries and data collected from family-farms, which are specialized in viticulture. Private (domestic) prices are prices at markets (e.g. prices of grapes or wine) in B&H. Because the concept of Farm Accountancy Data Network (FADN) does not exist in B&H, we apply the production technology which is commonly used in the wine growing sector (see IVANKOVIĆ, 2003).

For the calculations of the PAM elements at international (economic) prices for tradable inputs, have been used additionally adjusted import c.i.f. unit values or export f.o.b unit values.<sup>9</sup> For example, import parity price at the farm level for fertilizer is the adjusted import c.i.f. unit value with additional handling and transportation costs. For grapes and wine we also conducted price comparisons with other countries in the region (e.g. Croatia and Slovenia). The economic price for wine grapes is the adjusted farm-gate price in Croatia. Export parity price for wine at the winery level is export f.o.b. unit value with reduced costs for selling and transportations from the winery to the border.

Shadow prices of primary domestic resources (land, labor and capital) are the second best prices in an alternative use

of resources. They are estimated on the basis of opportunity prices.

For land, it is assumed that the opportunity cost is equal to its average rental (concession) value considering land quality, land classification and land accessibility.<sup>10</sup> Land market and land leasing in the winegrowing cantons in B&H are emerging. In the winegrowing cantons in B&H, rental value for 1 ha of agricultural land, for example in the municipality of Čapljina in the Neretva canton, is at 150 KM per ha.<sup>11</sup> This amount is taken as a rental value for land in our PAM calculations.

The opportunity cost for labor considers both the marginal product of labor in the second best use and unemployment in the economy. The labor market in B&H is emerging. Average wage in the Federation of B&H is higher than in the RS. As winegrowing areas are situated in the Federation of B&H, we consider these wages as more relevant for our calculations. The monthly average gross wage in the Federation of B&H increased from 551 KM in 1999 to 710 KM in 2002 (Table 6). The high rate of unemployment (about 40 %) is also considered in evaluating the shadow price of labor in the wine sector.<sup>12</sup>

The evidence on marginal productivity of capital in its the second best use is not available, but data are available for interest rates on loans from the Central Bank of B&H (CBB&H). The average annual interest rate with some variations across individual years amounted to 13.9 % for short-term loans and 11.2% for long-term loans. From the Investment Bank of Federation of B&H, the interest rates varied from 5.92 % for short-term loans and 6.33 % for long-term loans. These are favorable foreign investment and development loans to economic associations. In our PAM computations the real interest rate of the Investment Bank of Federation of B&H is considered at 5.92 %, while we have conducted several sensitivity analyses on changes in real interest rates and other capital costs such as prices of shares on capital, costs of repairs and similar capital costs.

### 3.2 Indicators of Relative Trade Advantages

Different indicators are developed to measure international competitiveness based on trade data. The advantage of using trade data is that demand and supply responses are considered simultaneously and that the costs of marketing and transport are taken into account (FROBERG and HARTMANN, 1997). Three measures of international competitiveness as relative measures that compare one sector relative to others are considered (e.g. BALASSA, 1989; SCOTT and WOLLRATH, 1992; EITELJÖRGE and HARTMANN, 1999; BOJNEC, 2001b):

(1) The Relative Export Advantage (RXA):

$$RXA_{ij} = (X_{ij} / \sum_{l,l \neq j} X_{il}) / (\sum_{k,k \neq i} X_{kj} / \sum_{k,k \neq i} \sum_{l,l \neq j} X_{kl})$$

(2) The Relative Import Penetration (RMP):

$$RMP_{ij} = (M_{ij} / \sum_{l,l \neq j} M_{il}) / (\sum_{k,k \neq i} M_{kj} / \sum_{k,k \neq i} \sum_{l,l \neq j} M_{kl})$$

(3) The Relative Trade Advantage (RTA):

$$RTA_{ij} = RXA_{ij} - RMP_{ij}$$

X and M refer to exports and imports, respectively. The subscripts i and k denote the product categories, while j and l denote the country categories. The numerator in equation (1) is equal to a country's exports, while in equation (2) to a country's imports of a specific product category relative to exports (imports) of this product from all the world excluding the considered country. The denominator reveals the exports (imports) of all products excluding the considered commodity from the respective country as a percentage of all other countries' exports of all other products. The level of these indicators shows the degree of relative revealed export competitiveness/import penetration. Values for RXA (RMP), which are above 1, suggest that the country has a relative revealed comparative export advantage (a relative comparative disadvantage in import penetration). Values for RXA (RMP), which are

Table 6: Wages and Unemployment in Federation of B&H  
Tabelle 6: Arbeitsmarktstrukturdaten in B&H

	1999	2000	2001	2002
Number of employed	407,754	410,808	407,199	394,132
Number of unemployed	262,971	259,702	269,004	282,473
Monthly average net wage in KM	374.54	412.72	443.26	482.71
Monthly average gross wage in KM	550.80	606.94	651.85	709.86
Wage per hour (180 hours) in KM	3.06	3.37	3.62	3.94

Source: Statistical Yearbook of Federation of B&H (2003).

below 1, indicate a low level of export competitiveness or a relative revealed comparative export disadvantage (a relative comparative advantage in import penetration) of the considered products. The RTA in equation (3) is implicitly weighted by the importance of the RXA and the RMP considering simultaneously both export and import activities. A positive RTA value greater than 0 indicates a relative revealed trade advantage, and vice versa when it is less than 0, a competitive trade disadvantage. Data used in calculations of relative trade advantages are obtained from the Statistical Office and Custom Office of the Federation of B&H.

#### 4 Empirical results

The calculated PAM for the wine sector in B&H contains the calculated elements of both the indicators of protection (NPR and EPR) and the indicators of efficiency and competitiveness (PCR, DRC and SCBR) (Table 7).

The NPR and EPR for wine grapes tend to decline. The EPR for wine grapes in 2002 is of the negative sign, indicating a slight taxation of value-added by producers. The NPR and EPR for wine explore greater variations, but they are found positive for all the analyzed years. Yet, the EPR for wine in 2002 is approaching the value of zero, implying rather neutral input and output price and trade policies toward the wine sector in B&H in that year.

The DRC and SCBR greater than 0, but less than 1, suggest that wine grapes production in B&H is efficient and internationally competitive.<sup>13</sup> Production of wine grapes is competitive when grape prices in the countries in the region (e.g. Croatia or Slovenia) as the benchmark are considered. However, international competitiveness of wine grape production is less predictable as it depends on the competitiveness of wine. Higher wine grape prices can improve the

quality of grapes, but may constrain the efficiency and competitiveness of wines. Restructuring of wine grape production to improve grape quality for high wine quality seems to follow marketing patterns towards higher quality of wines, which it would be possible to sell at higher prices. This was the reason that, in the PAM calculations, only prices of high quality wine are considered as potential for growth of the wine sector in B&H. The market selection process is forcing both wine grapes and wine producers towards higher quality. Producers not able to follow this market selection process will either reduce their production or even leave the sector, or else turn towards small-scale production for home consumption needs and hobby farming. Restructuring of viticulture households is caused by market pressures forcing an increase in efficiency and international competitiveness in response to demands for high quality wines. With some additional rationalization and cost reductions for non-tradable inputs (e.g. insurance) and primary domestic resources, the efficiency and international competitiveness in wine grape production can be further improved.

The DRC for wine is greater than zero and smaller than 1, except in 2001. The DRC results are particularly sensitive to economic wine prices, indicating that only high quality wines turned out to provide opportunities for internationally competitive wine production in B&H. This clearly suggests that high wine quality and marketing are the key factors for an internationally competitive wine production in B&H. Three processes are under way in the B&H wine sector inducing pressures toward greater efficiency and international competitiveness. First, production concentration is induced by a market selection process that results in concentration towards more efficient and internationally competitive wine grape producers and wineries. Second, there is a shift in wine production from quantity to higher quality of wines to achieve higher wine prices. Third,

Table 7: Policy Analysis Matrix (PAM), indicators of protection and competitiveness for the wine sector in B&H, 1999–2002

Tabelle 7: Politische Analysen-Matrix (PAM), Indikatoren für Wettbewerb und Schutzpolitik im Weinsektor in B&H, 1999–2002

Indicators of protection and competitiveness	Wine grapes				Wine			
	1999	2000	2001	2002	1999	2000	2001	2002
Nominal protection rate (NPR in %)	38.4	19.3	20.4	4.4	13.0	14.9	47.6	22.7
Effective protection rate (EPR in %)	46.5	19.6	20.9	-1.1	12.6	6.8	106.0	0.5
Social cost-benefit ratio (SCBR)	0.94	0.98	0.92	0.89	0.86	0.91	1.16	1.00
Domestic resource cost (DRC)	0.91	0.98	0.88	0.85	0.76	0.83	1.38	1.00
Private cost ratio (PCR)	0.64	0.86	0.76	0.90	0.67	0.78	0.67	0.67

Source: Ivanković (2003) and own calculations



product differentiation and market targeting towards segmented domestic and international niche markets are increasing of importance. On domestic markets, these are niche markets for domestic consumers with high income, foreigners and particularly tourists to explore the roles of religious events for the sale of wine tourism products and souvenirs.

On the other hand, the calculated results of indicators of relative trade advantages for the wine sector in B&H show the weaker, i.e. only slightly competitive wine industry in B&H (Table 8). The RXA does not confirm a relative revealed comparative advantage in B&H wine exports. The RMP indicates a relative comparative advantage in import penetration in wines in B&H as a reason that except in 1999 the RTA shows positive values suggesting a relative revealed trade advantage in the B&H wine sector. However, the positive RTA values are closer to zero, which means very low relative revealed trade advantages in B&H wine trade.

Table 8: Indicators of Relative Trade Advantages for Wine in Federation of B&H

Tabelle 8: Indikatoren für den relativen Wettbewerbsvorteil der Weinproduktion in B&H

	RXA	RMP	RTA
1999	0.3708	0.4016	-0.0308
2000	0.1248	0.0003	0.1245
2001	0.0005	0.0005	0.00001

Source: Own calculations

## 5 Conclusion

The PAM and revealed comparative trade advantage analyses for the wine sector in B&H have been conducted. It is found that the wine sector in B&H, under favorable natural conditions and relatively low costs of non-tradable domestic factors, provides the potential and opportunities to become internationally competitive. While consumption of wine in B&H remains low, demand increases are expected with real income growth and new arrivals of international tourists to the wine growing cantons of Neretva and Western Herzegovina in the Federation of B&H. As a large number of tourists are coming to the religious site of Medugorje, which is situated in the middle of the wine growing area in the Neretva's canton, wine is one of the potential souvenirs to be recognized by tourists visiting this region. This is consistent with the one of the most striking findings of our PAM analysis that the level of the wine price, which

expresses wine quality, including packaging and wine marketing, is the crucial factor for efficiency and international competitiveness of the wine sector in B&H. The DRC and SCBR for the wine sector in B&H are largely between 0.75 and 1, suggesting potentials for the sector's further development in an open, international environment. There are opportunities for further efficiency improvements in the wine sector of B&H. First, the process of transition and restructuring in B&H is lagging behind other CEE countries, also due to the war. Due to the unfinished privatization process, the ownership and operational structures in the largest wineries are not yet defined. The wineries are largely under the control of managers who lack managerial knowledge. The horizontal and vertical marketing chain linkages of the wine sector either collapsed or do not function properly. There is a need for further transformations of organizational relations within the wine chain between the grape growers and the wineries, and in the wine marketing chain between the wineries and supermarkets and other wine traders. The wine sector also needs capital for urgent investments in vineyards and particularly in improvements of technologies for wine making and wine bottling. The wine sector can be attractive for investments by the domestic Diaspora and by foreign direct investors. Second, wine marketing and promotion activities are a special challenge and opportunity for the wine sector in B&H. The focus on niche wine markets and wine market segmentation seems to be a strategy for B&H by which to develop the wine marketing opportunities. Very low wine consumption in B&H is determined by low real incomes, but also by cultural, ethnic and religious factors. There are opportunities to increase consumption of high quality wines by proper promotional activities for consumption of autochthony wines. With increasing incomes in B&H, domestic demand for wines is likely to increase. However, the great potential for wine sales is the growing religious tourism in the wine growing canton and other tourism in the neighborhood. The impact of tourists on this fragile area, the appropriate methods of managing the wine cellars, together with good food and wine as important aspects for tourist destination development, seems to be relevant for this micro-wine region in B&H in the middle of the religious site of Medugorje and close to the multi-ethnic historical town of Mostar. The advantage of wine production in B&H is also its geographical proximity to the Adriatic coast, where are also situated some well-known Croatian tourist towns, such as the most notable cultural image, the medieval walled city of Dubrovnik. There are also opportunities for wine promo-

tion in Western countries where the Diaspora from B&H is to be found. The export opportunities on the international markets are mixed, largely constrained by internal factors inside the economy of B&H. Third, efficiency and international competitiveness in the wine sector is considerably biased towards wine prices. Efficiency of grape production and selling of grapes is considerably associated with and dependent on wineries. The quality of wine making, wine bottling and wine marketing are the crucial determinants for achieving higher wine prices, efficiency improvements and international competitiveness in the wine sector. The emerging tourist destinations within the wine region and the neighborhood seem to provide the greatest opportunities and challenges for the wine sector in B&H to develop long-term sustainable wine production promoting the cultural, historical, gastronomic, environmental and societal aspects of these fascinating regions. Finally, with delay, but with the intention of joining the World Trade Organization (WTO) and of becoming a member of the EU, B&H needs to develop primary evidences on which agricultural and food policy modeling can be developed. Lack of data and lack of coordination in data collection represent considerable constraints in any data base development and policy modeling. The methodological approaches used can be expanded to other agricultural and food chains and other economic activities to show their development potentials in an international environment. Such results provide indications for entrepreneurs as to the directions in which to restructure or invest, and for policy makers in taking decisions and for negotiations of B&H for membership in WTO and in EU. The international competitiveness of the agri-food sector in B&H is also constrained by some other, non-economic factors such as compliance with quality, phytosanitary, health and veterinary EU standards required in trade with the EU and other developed countries. Although they are not explicitly addressed in this article, they are still an issue for future research.

## Notes

- 1 The empirical part of this article is largely based on the Ph.D. dissertation by IVANKOVIĆ (2003), which was conducted under the supervision of Ante Kolega and Štefan Bojnec.
- 2 On the territory of the former Yugoslavia, the average wine consumption per capita was around 28 liters, but with considerable variations from 0.5 liters per capita in Kosovo to 60 liters in Slovenia (KOLEGA and MILAT, 1990).
- 3 Austria is also known as a country with wine tourism in individual cellars and with development of tourist destinations in wine growing areas.
- 4 We also estimated income elasticity of demand for wine in B&H, which is around 1.2, suggesting relatively elastic and thus responsive wine demand with respect to real income increases in B&H.
- 5 A growing body of literature has become known as wine and food tourism (e.g. HALL and MACIONIS, 1998; HALL et al., 2000; and GETZ, 2000).
- 6 Most recently the custom offices have been merged into the one custom office of B&H.
- 7 See also MONKE and PEARSON (1989), TSAKOK (1990), and BOJNEC (2001a).
- 8 See also BOJNEC (1999) for similar explanation in the case of Slovenian agriculture and the food sector.
- 9 Import c.i.f. (cost insurance and freight) unit values and export f.o.b. (free on board) unit values.
- 10 Several initial studies for CEE countries omitted the shadow price of land in their computations. One of the reasons was that land prices and land rental values at the beginning of transition were very low compared to EU countries.
- 11 Source: Viticulture enterprise „Plantaže“, Čapljina with wine grapes production on 130 ha of state land.
- 12 In 2002, the rate of unemployment was 41.7 % in Federation of B&H and 38.6 % in RS.
- 13 PCR greater than 0 but less than 1 indicates efficient wine grapes and wine production in B&H at domestic conditions.

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