

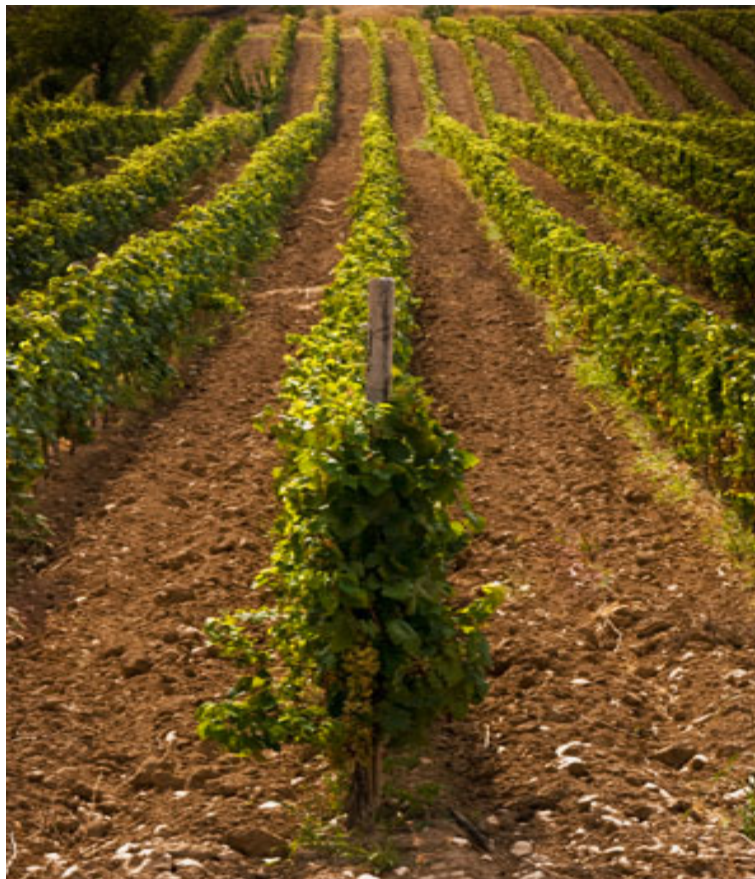


Swedish University of Agricultural Sciences  
Faculty of Natural Resources and Agricultural Sciences  
Department of Economics

# The wine production in FYROM

## - Does the wine sector have a comparative advantage?

*Per Andersson & Magnus Ödlund*



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**Wine production in FYROM – Do they have a comparative advantage?**

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# Abstract

FYROM has a long tradition of producing wine. Wine production in FYROM is one of the greatest contributors of the agricultural share of their GDP. The aim of the thesis is to see if the wine production in FYROM has a comparative advantage compared to other countries that produce wine and if FYROM is able to sustain the advantage in the future. The countries chosen for comparison are Bulgaria, Croatia, France and Italy.

The methods used in the thesis are the Balassa Index and Porter's *Diamond of National Advantage*. These economic tools address the comparative advantage of a nations sector of production. The calculation of the Balassa Index show that FYROM has a comparative advantage in wine production in respect to Bulgaria and Croatia, but not compared to France and Italy. The vineyards are outdated and the vines and grapes do not meet the foreign market demands in respect to quality of the wine produced. There is therefore a need of a renewal of the vineyards to improve the quality. The economic situation of the wine farmers requires aid from the government for the renewal and for FYROM to sustain and strengthen their comparative advantage.

# Sammanfattning

FYROM har en lång tradition av vinproduktion. Produktionen av vin är en av de största bidragande industrierna till jordbrukssektorns del av FYROMs BNP. Syftet med uppsatsen är att undersöka om vinproduktionen har komparativa fördelar jämfört med andra vinproducerande länder, och om FYROM har möjlighet att uppehålla denna fördel i framtiden. De länder som jämförs är Bulgarien, Kroatien, Frankrike och Italien.

Metoderna som används i uppsatsen är Balassa Index och Porters *Diamond of National Advantage*. Dessa ekonomiska verktyg undersöker om ett lands sektor har komparativa fördelar eller inte. Beräkningarna av Balssa Index visar att FYROM har komparativa fördelar i vinproduktionen jämfört med Bulgarien och Kroatien, men inte jämfört med Frankrike och Italien. Vingårdarna är gamla och vinrankorna och druvorna möter inte efterfrågan från de externa marknaderna gällande kvaliteten på vinet. Det finns därför ett behov av att förnya vingårdarna för att förbättra kvaliteten. Den ekonomiska situationen för vinodlarna kräver ekonomiskt stöd från staten för att förnya vingårdarna och att uppehålla och stärka dess komparativa fördelar.

# Abbreviations

BI	Balassa Index
BNAC	Balkan Non-Associated Countries
CEEC	Central and Eastern European Countries
DRC	Domestic Resource Cost
ETC	Early Transition Countries
EU	European Union
EUR	Euro
FAO	Food and Agriculture Organization of the United Nations
FSU	Former Soviet Union
FYROM	Former Yugoslavian Republic of Macedonia, the
GCR	Global Competitiveness Report
GDP	Gross Domestic Product
OIV	International Organization of Vine and Wine
RCA	Revealed Comparative Advantage
RSCA	Revealed symmetric comparative advantage
WBC	Western Balkan Countries
WTO	World Trade Organization
\$	US Dollar

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# 1 Introduction

In this chapter a brief background of FYROM will be presented. It will mainly focus on the history of FYROM, the political and economic climate and a background of the agri-sector with a brief introduction to the wine industry in FYROM. Finally the problem of the thesis will be presented.

## 1.1 Background

### 1.1.1 History of FYROM

The Macedonian territory has, throughout history, always been a crossroad between the Mediterranean area and Asia (www, US Department of State, 2010). This has led to a rich and varied culture and traditions throughout history. The Macedonian area belonged to the Roman Empire until its fall in the 5<sup>th</sup> century. It was then undertaken the Byzantine Empire during the 5<sup>th</sup> and 6<sup>th</sup> century until they were conquered by the Ottoman Empire in the 15<sup>th</sup> century. The Macedonian area was under Ottoman rule until 1912.

In the middle of the 19<sup>th</sup> century Greece, Bulgaria and Serbia were competing for influence in the Macedonian area of the Ottoman Empire (ibid.). At the same time nationalist uprisings began in the Macedonia area which ultimately led to the Ilinden Uprising in 1903. The uprising was initially successful, but was finally put down by the Ottoman army. Macedonian guerrilla campaigns continued a few years and later led to the Macedonia area being split up between Serbia<sup>1</sup> in the north, Greece in the south and Bulgaria in the east.



Figure 1. Map of FYROM. Source: (www, CIA, 2011)

During the First World War the Macedonian area was occupied by its neighbouring countries, and in the Versailles treaty that followed the war it was decided that *Vardar Macedonia*<sup>2</sup> should be incorporated into the *Kingdom of Serbs, Croats and Slovenes* (ibid.). During the Second World War the Macedonia area was occupied by Italy and Bulgaria. There were partisan movements within FYROM which later led to the liberation of the area in 1944. After the war FYROM became a part of the Socialist Federal Republic of Yugoslavia. In this time period the culture and language of the Macedonians flourished.

<sup>1</sup> Later Yugoslavia

<sup>2</sup> The area representing FYROM today

During the late 20<sup>th</sup> century communist regimes fell throughout Europe, and FYROM declared its independence from Yugoslavia in 1991 (ibid.). Since FYROM had not been an independent state for hundreds of years there were a number of different ethnicities within FYROM's community. Most of them, including the majority of the Slavic people, identified themselves as Macedonian while other minorities such as the ethnic Albanians kept their own culture and language. There were a number of small ethnic disputes during the 1990's which ultimately led to an armed conflict erupting by the Kosovo border in 2001. Due to international mediation a *cease fire* was declared in the summer of 2001, and later on the government sought through a constitution in order to opposing parties representing the minority groups within FYROM in the government.

When FYROM declared its independence from the Socialist Federal Republic of Yugoslavia they declared it under the name *Republic of Macedonia (ROM)* (www, Hellenic Ministry of Foreign Affairs, 1, 2010). This was not approved by the Greek government which meant that the name made intrusions on the history of Greece. According to the Greek government the name *Macedonia* refers to the civilisation and state of Macedonia who have been part of Greece's national and historical heritage and has no connection to the inhabitants of the *ROM*, who mostly consists of Slavic people. They also claim that FYROM is not only the area of *ROM*, but includes a larger area that includes both Bulgaria and Greece. When the *ROM* entered the UN there were many complaints from Greece that they did not recognize this name. The *ROM* then agreed to change their name within the UN to the *Former Yugoslav Republic of Macedonia (FYROM)*. This dispute is still going on with uncertainty of what *ROM*'s or *FYROM*'s official name is. In 2008 *FYROM* wanted to join NATO, but Greece put up a veto against their entry unless there is a resolution of what the final name *FYROM* will use (www, The Washington Times, 2008).

### 1.1.2 FYROM's Economy

*FYROM* is a small and open economy (www, CIA, 2011). After the independence in 1991 *FYROM* was the least developed area of the former Yugoslav republics. The separation led to many challenges for *FYROM*, leaving a large open-market with twenty-two million possible consumers to a single market with only two million inhabitants. They also lost the large transfer payments from the Yugoslav government and faced many years of political and ethnic difficulties in the region. *FYROM* was and is very trade-dependent and these factors led to a shock for the economy of *FYROM* (www, US Department of State, 2010). After the independence the government had to make extensive structural reforms to the economy and imposed macroeconomic stabilization programmes, which generated additional disturbances to the economy.

The name dispute with Greece ultimately led to a trade embargo by the Greeks towards *FYROM*, who were very dependent on the trade with Greece (ibid.). The Albanian ethnic armed conflict in *FYROM* frightened foreign investors to invest in the country and led to a decline in demand for their products such as textiles and steel. Since then *FYROM* has had a restrained economic growth which was affected by the financial crisis. In 2003, *FYROM*



joined WTO and have since then joined several trade agreements including CEFTA in 2006 (Dimitrievski and Kotevska, 2008). In 2001 they signed the Stabilization and Association Agreement with the EU and in December 2005, they became a candidate for EU accession.

FYROM had an estimated GDP of \$9.3 bn in 2010 (\$5.8 bn in 2005, \$9.8bn in 2008) (www, IMF, 2011). There has been a significant increase since 2005, but the economy declined after the financial crisis in 2008. The estimated GDP per capita for 2010 is \$4 546 (\$2 854 in 2005, \$4 786 in 2008). The same effect can be seen here. FYROM's unemployment rate is high, 33 % in 2010, but has had a steady decline since 2005 when it was 37 %. They had an increasing growth rate, as of GDP, from 4 % in 2005 to 5 % in 2008, but it has declined mostly due to the financial crisis to -0.8 % in 2010.

*Table 1. Economic Indicators 2009. Source: (www, IMF, 2011)*

<b>Indicator/Country</b>	<b>FYROM</b>	<b>Bulgaria</b>	<b>Croatia</b>	<b>France</b>	<b>Italy</b>
<b>GDP (current prices in US \$)</b>	9.3 bn	47.1 bn	67.2 bn	2656.3 bn	2118.2 bn
<b>GDP/Capita (current prices in US \$)</b>	4 546	6 223	15 283	42 412	35 435
<b>Growth rate (as of GDP)</b>	-0.80 %	-5 %	-5.80 %	-2.50 %	-5 %
<b>Foreign Direct Investment (net inflow in US \$)</b>	0.247 bn	4.5 bn	2.9 bn	59.9 bn	28.9 bn
<b>Unemployment rate</b>	33 %	6.80 %	9.20 %	9.40 %	7.80 %

The table above shows some economic indicators for FYROM in comparison to other countries in the region, Bulgaria and Croatia, and Italy and France as large wine producers.

### 1.1.3 FYROM's agriculture

FYROM is a landlocked country and has an agriculture that is on the way of impoverishing (Dimitrievski et al, 2010). FYROM has a surface area of 25,713 km<sup>2</sup> and the country consist mainly of a hilly and mountainous geography. The agricultural area is about 41 % of the total surface area and is 1.1 million ha in size. There is an urbanization taking place in FYROM, where a large amount of the population is living in the larger cities of the country and where farmers are changing to another occupation.

The agriculture played and is an important part of FYROMs economy (ibid.). Even though there has been instability in the country's past, agriculture has been flexible and has contributed to stability in the social and economic part of the country.

The agriculture accounts for 10 % of the GDP in FYROM, and combined with the food industry it accounts for about 15 % (ibid.). In the 1990's several industries closed down, which led to an increase of labour availability in the agri-sector. The share of agriculture in total employment is about 20 % and will probably be the same amount in the future. Today FYROM is in the integration process of becoming an EU member. The integration process has contributed to positive aspects in the agri-sector of FYROM.

*Table 2. Percentage shares of agriculture in GDP and percentage shares of agri-food exports and imports. Source: Dimitrievski et al, 2010:147.*

	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Share of agriculture in GDP</b>	10	9.8	10	11.4	11.3	10.8	10.8	9.4	10.4
<b>Share of agriculture in total employment</b>	27	24.9	23.8	22	16.8	19.5	22.1	18.2	19.6
<b>Share of agri-food exports in total goods exports</b>	12	14	15	14	14	13	12	12	11
<b>Share of agri-food imports in total goods imports</b>	10	17	19	17	16	17	16	14	14

The agri-sector and arable land are fragmented in FYROM (Dimitrievski et al, 2010). Due to the privatization of the agri-sector, the arable land is mainly owned by family farms. Some of the arable land is still owned by the government, which are either leased by family farms or by private companies. As mentioned before, the family farms cultivate and use most of the arable land in FYROM, but they are however distributed on a very large amount of families and the average size for a family farm is 1.4 ha (ibid.). On the other hand you have the private companies that have an average farm size of 265 ha. In recent years, there is a trend pointing towards an increase of private companies in the agri-sector of FYROM.

## 1.2 Problem

In 1999, three regions in Europe accounted for 9.3 % of the wine output in the world (Noev and Swinnen, 2001). These three regions are the CEEC, BNAC (or sometimes referred to the WBCs) and FSU. Together they could compete with the wine production in the USA which accounted for 7.4 % of the world wine output in 1999.

Vegetables and horticulture are a large part of the agricultural output in FYROM, being 28 % of total agricultural output (Dimitrievski et al, 2010). Horticulture includes the production of wine (viticulture). The production of wine is an old tradition in FYROM due to its favourable climate and fertile soil. Almost 80 % of the grape production is used in the production of wine. It is mostly produced by family farms in order to make an extra income. It is also important for the country's economy because a large share of the wine is exported. Wine and other beverages are the second largest agricultural commodity being exported by the country after tobacco and tobacco products.

FYROM is one of the largest net exporters of wine of the three transition regions (Noev and Swinnen, 2001). Wine production is of great significance for FYROM, it alone contributes with a 20 % share of the agricultural share in GDP and a large share of the wine produced is being exported (Dimitrievski and Kotevska, 2008).

All of the regions mentioned above have one thing in common, their transition from being under a communist rule to be liberalized have had its effects on their production of wine (Noev and Swinnen, 2001). During the 1990s there was a decline of 25 % in the wine output and a decline of 27 % in vineyards for the BNAC.

The law of comparative advantage was introduced by David Ricardo in his book *The Principles of Political Economy and Taxation* in 1911 (Koo and Kennedy, 2005). He argued that if a country has a comparative advantage in the production of several different commodities, the country should choose to produce the commodities that have the greatest comparative advantage. The trading partner should then decide to produce the commodities by which it has the least disadvantage in producing. By trading their output with each other, they will both be able to produce and consume more than they did before.

A country has a comparative advantage compared to another country if it has to use less input in order to produce an output (Koo and Kennedy, 2005). The input, in the common trade theory, is either capital or labour. The wine production in FYROM is labour intensive, this is mainly the case for the family farms that produce wine (Noev and Swinnen, 2001) which there are many of in FYROM (www, FAO, 1, 2011).

**The objective of the study is to see if the wine production in FYROM has a comparative advantage in respect to other countries that produce wine.** In regard to what have been mentioned above, an assumption can be made that the wine production in FYROM will have a comparative advantage. This leads to the question of: **how can FYROM keep its comparative advantage and/or competitiveness against other wine producing countries?**

### 1.3 Aim and delimitations

The aim of the study is to see if the wine production in FYROM has a comparative advantage and if it is competitive in respect to other wine producing countries. Limitations have been done so that the study only focuses on the comparison between the wine production in FYROM and other wine producing countries instead of comparing different agricultural commodities in FYROM. The countries chosen for a comparison are Bulgaria, Croatia, France and Italy.

## 2 Method

In this chapter the method of the study is presented. The method used is a literature review to explain the comparative advantage and competitiveness. The chapter also gives an outline of the study.

### 2.1 Literature review

The method being used for the study is a quantitative literature review. It will review literature of comparative advantage, wine production in FYROM as well as for the international wine sector, and a review of aspects that can provide and contain a comparative advantage in a production.

The study uses three analytical approaches in order to explain and show the comparative advantage and competitiveness of the wine production in FYROM. The three analytical tools will be the empirical part for the forth coming analysis. The three analytical approaches are:

- Porter's *Diamond of National Advantage*
- Balassa index (BI)
- Domestic resource cost (DRC)

A brief theoretical approach of the DRC is presented in the literature review, the full review is located in appendix E. This has been done due to that no data was gathered in order to calculate the DRC. A contact at a winery in FYROM was contacted, but did not have the time to send the information in time for evaluation of the thesis.

The literature review will consist of scientific articles, university textbooks, reports, documents and web pages. The data used for the calculation of the two economic models have been assessed through databases provided by organizations online, such as FAO and UNcomtrade.

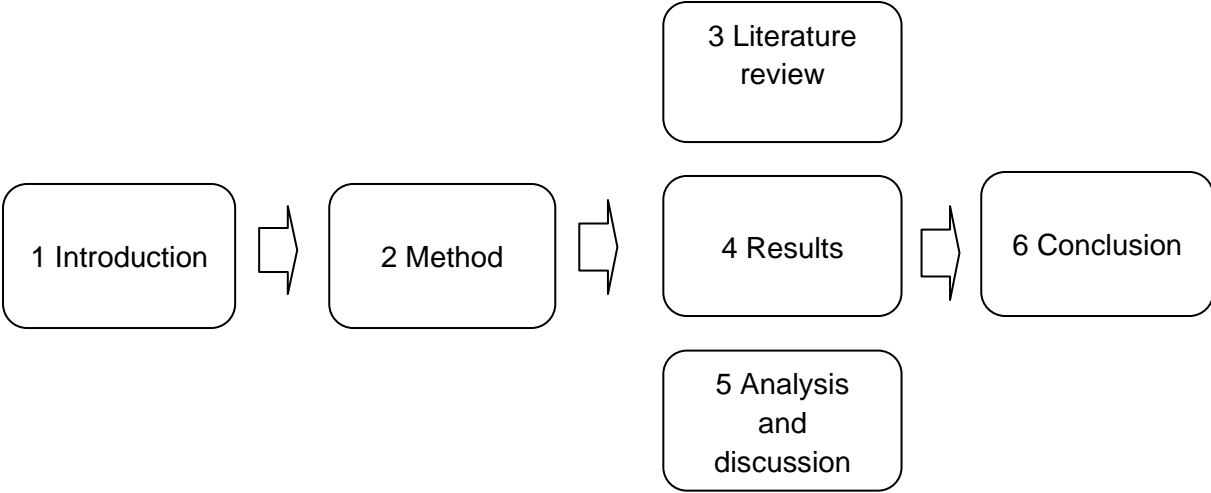
### 2.2 Outline

This subchapter will explain the outline of the study made and is illustrated in figure 2 below.

(Chapter 1) is the introduction which gives background information of FYROMs history, economic climate and the problem of the study. (Chapter 2) is a description of the methods used in the thesis in order to analyze the problem stated in the introduction. (Chapter 3) is the literature review which explains the concepts of comparative advantage and competitiveness. It also includes the description and expressions and formulas of the two economic tools used in the thesis. (Chapter 4) will present the wine sector of the world, the trade of FYROM and FYROMs wine sector more thoroughly. The chapter includes the results from the calculations of the BI and a presentation of FYROMs *Diamond of National Advantage*.

(Chapter 5) will analyze and discuss the problem stated in the first chapter by the help of the information assessed and presented in chapter 3 and 4. Out of the analysis there have been

conclusions drawn and some concluding remarks will be presented. A figure explaining the outline of the study is presented below:



*Figure 2. An illustration of the outline of the study. Source: Own illustration.*

## 3 Literature review

“No single measure or definition of competitiveness has gained the universal acceptance of either economists or management theorists.” (Banse et al, 1999:1)

This chapter will present two approaches that will be used in the thesis in order to explain and measure if the wine production in FYROM is competitive and has a comparative advantage or not in respect to other wine producing countries. The expressions and formulas for the two economic models are presented and explained as well as Porter’s *Diamond of National Advantage*.

### 3.1 Concept of comparative advantage

*The Wealth of Nations* by Adam Smith is one of the cornerstones for the international trade theory today (Husted and Melvin, 2004). In it he wrote about the factors of production, where men were specialized in different parts of the production of a good. He then concluded that if countries also specialized themselves in the production of a few goods they then could produce more of them. The only input used at that time was labor, so the production of goods only exhibits constant return to scale.

Adam Smith was the founder of the absolute advantage, which is when a country can produce a good with fewer inputs than any other country in the world (Husted and Melvin, 2004). Assume two countries, *A* and *B* producing two goods: *X* and *Y*. If country *A* can produce good *X* faster and with less labor than country *B*, then country *A* have a absolute advantage in the production of good *X*. Presumably, by logic reasoning, country *B* will have an absolute advantage in the production of good *Y*.

Those who read the book by Adam Smith started to think, what if a country has an absolute advantage in the production of both goods? The answer was given by David Ricardo, who came up with the law of comparative advantage (Husted and Melvin, 2004).

“A country has a comparative advantage in producing a good if the opportunity cost of producing that good in terms of other goods is lower in that country than it is in other countries” (Krugman and Obstfeld, 2000:13)

and

“A country has a comparative advantage in a good if the product has a lower pretrade relative price than is found elsewhere in the world” (Husted and Melvin, 2004:60)

Assume, again, two countries *A* and *B*, trading two goods with each other: *X* and *Y*. In order for a country to produce either one of the two goods it have to use a certain amount of resources. If a country chooses to produce more of good *X*, it has to give up resources used in the production of good *Y*. What has been previously mentioned is a simplified explanation of the opportunity cost. An opportunity cost is a description of a trade-off (Baron, 2000) between the good *X* and *Y*. It considers how many goods of *X* a country could have produced with the resources it has in respect to how many it could have produced of the good *Y*.

With trade taken into consideration, country *A* may choose to produce both goods, but the production of the good *X* is more costly than the production of good *Y* and in country *B* it is the other way around. With this background stated, country *A* should then produce more of good *X* because it has a comparative advantage in the production of it in respect to country *B*. Country *B* will on the other hand produce more of the good *Y* because it has a comparative advantage in the production of it. Both countries will benefit from trade; if they choose to specialize in the production of the good they have a comparative advantage in (Baron, 2000).

It is stated above that country *A* has a comparative advantage in producing good *X* while country *B* has a comparative advantage in producing *Y*, there is no great authority that decides that they should specialize their production (Krugman and Obstfeld, 2000). Instead it is the supply and demand on the world market that decides what is being produced.

Economists are like scientists, never satisfied with their findings and always in search of a better descriptive model or answer (Husted and Melvin, 2004). Some abandoned the classical theory of comparative advantage and two of them came up with a new theory for international trade, namely Eli Heckscher and Bertil Ohlin who developed an alternative model to explain the formation of trade between nations.

The HO model takes more variables into account than the classical theory of comparative advantage (Husted and Melvin, 2004). They built their model around two characteristics, first that each country are different in regard to the factors they possess for production, and second that the factors used for production differ from each other. A country can have a comparative advantage in the production of a good if it uses less factor endowments<sup>3</sup> than another country. For instance, if a country has a large amount of natural resources such as iron, that country will have a comparative advantage in the production of metal and goods made out of metal.

The HO model have not performed its best in empirical tests, therefore new alternative theories have been developed in order to better explain comparative advantage (Husted and Melvin, 2004). One of these theories is the *Human Skills Theory* developed by Donald Keesing. He argued that the theory of comparative advantage should not take too much of the factor endowments into consideration, instead it should look at the skilled- and unskilled labor for production in a country. For example, some production processes need more skilled labor than others (production of computers contra textiles).

Another theory is the *Similarity of Preferences Theory* developed by Stefan Linder (Husted and Melvin, 2004). All theories about comparative advantage have all been examining the supply side of a country, Linder hypothesis looks at the demand side instead for describing the comparative advantage of a country. He argued that a country produces goods after the preferences of the consumer, but no consumer is the other one alike. Many consumers can choose to buy close substitutes in order to maximize their utility. By international trade, a consumer has a larger variety of goods to consume, many of which are close substitutes. The hypothesis also explains how countries trade with each other. The trade will initiate between

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<sup>3</sup> Different inputs of production such as land, labor, capital and/or natural resources (Husted and Melvin, 2004).



countries with similar standards, the factor endowments are the ones which set the terms for standards in the countries. This implies that rich countries tend to trade with other rich countries, while poor countries trade with other poor countries. The model, however, is not applicable for all goods produced in a country, but mainly for agricultural and raw material products. Despite this, the model does explain how intra-industry<sup>4</sup> trade occurs, which other models of comparative advantage do not.

### 3.2 Concept of competitiveness

In the article “*The Competitive Advantage of Nations*” Michael E. Porter states that:

“A nation’s competitiveness depends on the capacity of its industry to innovate and upgrade. Companies gain advantage against the world’s best competitors because of pressure and challenge. They benefit from having strong domestic rivals, aggressive home based suppliers, and demanding local customers.” (Porter, 1990:73)

The strategies of world leading companies differ from each other, but the underlying mode and character of all successful companies is fundamentally the same (Porter, 1990). The question is why these companies have succeeded, why they are capable of innovation and pursue improvements and why they are able to overcome barriers. Porter has developed the “*Diamond of National Advantage*” to determine what conditions and business environment that is necessary for a nations industry to succeed. The model uses four attributes of a nation, creating a system that constitutes as the diamond of national advantage. The attributes are (a) Factor Conditions, (b) Firm strategy, Structure and Rivalry, (c) Demand Conditions and (d) Related and Supporting Industries.

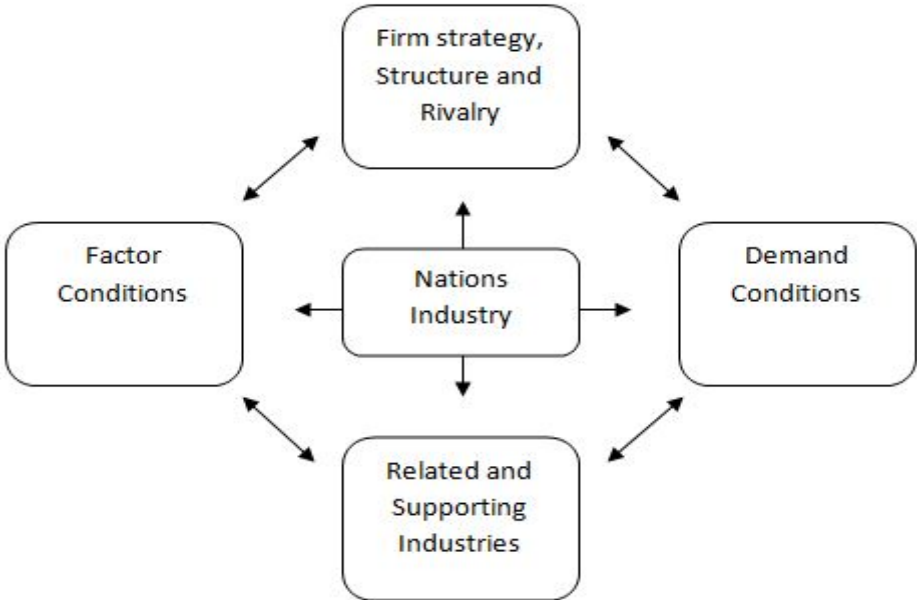


Figure 3. Porter's Diamond of National Advantage. Source: Porter, 1990:78

<sup>4</sup> Explaining how a country can both import and export a similar good at the same time (Husted and Melvin, 2004:136).

- (a) *Factor Conditions concern the nations factors of production such as labor, infrastructure, resources and capital. It is not only sufficient to have an educated workforce and basic resources, these factors need to be specialized into an industry's particular needs to support the concept of a competitive advantage. These factors are more scarce and difficult to imitate and therefore require continued investments to create.*
- (b) *Firm strategy, Structure and Rivalry concern the creation of companies, how they are organized and managed and the domestic competition. There is no universal management system that is best, it depends on the type of business and on the business climate in the specific nation. There also has to be a strong domestic rivalry to stimulate the need to create competitive advantages. Domestic rivalry is the most important attribute to the model, because of its affect on all the other attributes.*
- (c) *Demand Conditions concern the local demand for the nations industry. There has to be a sophisticated home-market where buyers can indicate emerging needs and pressure the companies to faster innovation and higher standards. This attribute is most helpful when the local market is greater than the international one, and the effects of the sophisticated consumers will then go out on the international market.*
- (d) *Related and Supporting Industries concern the presence of local internationally competitive suppliers and other related industries. An internationally competitive supplier on the home-market delivers the most cost efficient and rapid inputs for the production. There is also important to be close to information from related industries with an exchange of ideas and innovation. Companies would have a bigger opportunity to influence their suppliers if they are located within the same nation.*

Each of these attributes must work together as a system to form a competitive advantage for the industry (Grant, 1991). Innovation and quality improvements are stimulated by high domestic rivalry and a sophisticated demand, at the same time as domestic rivalry is stimulated by the creation of new companies stimulated by the availability of local factors. The system brings tight interaction between firms and creates industry clustering. These linkages, both horizontally and vertically, stimulate the creation of specialized factors, such as technologies, employee skills and infrastructure that would create a competitive advantage to the nation.

### 3.3 Economic tools for measurement

There is no best way to measure comparative advantage or competitiveness, therefore the choice was made to use two different approaches in order to measure the comparative advantage and competitiveness of the wine production in FYROM. However, due to a shortage of time and the failure of assessing the figures needed to calculate the DRC, brief theory behind the DRC is presented in this chapter. The full theoretical review of the DRC has been placed in appendix E. The Balassa Index (BI) and its expressions for measurement are presented in the subchapter below.

#### 3.3.1 Balassa index

In 1965 Bela Balassa published a paper where someone for the first time used the revealed comparative advantage (RCA) (Laursen, 1998). RCA has since then been frequently used by several reports and academic publications in order to measure the specialization of the international trade. With the emergence of the new trade theory, new ways of trying to explain and predict the trade flows arose, such as economies of scale. Despite this, the comparative advantage is the one that explains the world trade flow the best (Benedictis and Tamberi, 2001).

The original concept behind RCA is to see which sectors in a country that is either strong or weak (Hinloopen and Marrewijk, 2001). The RCA is usually referred to the Balassa Index (BI) of the RCA (Benedictis and Tamberi, 2001). The BI is part of the RCA and the BI only uses exports as the variable for information, it does not take imports into account.

BI cannot be derived theoretically which makes it hard to interpret the values that are given through the calculation of it (Hinloopen and Marrewijk, 2001). Even though, the BI is used widely and was for example used by Michael Porter in his book about *The Competitive Advantage of Nations*.

Below is the expression for the BI presented:

$$BI = \frac{\frac{X_{cs}}{X_c}}{\frac{X_{ws}}{X_w}}$$

with

$X$  being exports.

$X_{cs}$  being exports for a specific country  $c$  in a specific  $s$ .

$X_c$  being the total exports of the country  $c$ .

$X_{ws}$  being the world  $w$  exports of a specific sector  $s$ .

$X_w$  being the total exports in the world  $w$ .

The expression of the BI varies between different authors, and this one was used by Benedictis and Tamberi (2001) in their paper about the BI. By calculating the expression of the BI, you will either get a number less than one or more than one.

If:

- $0 < BI < 1$ : There is a comparative disadvantage in the sector  $s$  in country  $c$ .
- $1 < BI$ : There is a comparative advantage in the sector  $s$  in country  $c$ .

Expression (1) only compares one specific country with a set of countries or the world (Benedictis and Tamberi, 2001). However, there are two other expressions that can be used when doing a cross-country analysis and they are presented below for country 1:

$$BI_{[1s]} = \frac{\frac{X_{1s}}{X_{ws}}}{\frac{X_1}{X_w}}$$

and for country 2:

$$BI_{[2s]} = \frac{\frac{X_{2s}}{X_{ws}}}{\frac{X_2}{X_w}}$$

with

$X$  being exports.

$X_{1s, 2s}$  being exports for country 1 or 2 in a specific sector  $s$ .

$X_{ws}$  being the world  $w$  exports of a specific sector  $s$ .

$X_{1,2}$  being total exports for country 1 or 2.

$X_w$  being total exports in the world  $w$ .

There is a difference between the cross-country analysis and the original BI. The difference is the exclusion of both countries 1 and 2 that are compared from the world  $w$  (Benedictis and Tamberi, 2001).

### 3.3.2 Implications of the Balassa Index

Some authors have made implications about the use of the Balassa Index or the RCA. For example, Laursen (1998) uses a different kind of measure in order to see if a country is specialized in a specific sector. He uses the Revealed Symmetric Comparative Advantage (RSCA). By doing a regression of both the RCA and the RSCA, he concludes that the usage of a non-adjusted RCA can lead to biased results.

Hinloopen and Marrewijk (2001) states that it is hard to interpret the numbers gained from the measurement of the BI. They also mention the problem of that a particular value of the BI for a country implies the same comparative advantage as for another country's value. In their article, they make an empirical analysis of how the distribution of the BI differs between

countries. They choose to look at the EU-12 and their exports to Japan in sectors where they are almost equal. They conclude that the distribution of the BI is skewed and confirms that a comparison of the BI between countries is problematic. In their empirical analysis they also found that the BI differs little over time.

Benedictis and Tamberi (2001) choose to look at two alternative normalizations of the BI by Proudman and Redding (1998) and Laursen (2000). The first normalization done by Proudman and Redding is about fixing the mean of the BI, while the other by Laursen (2000) is about using a symmetric BI. Benedictis and Tamberi conclude that the new normalizations of the BI have made it more limited than before. They further conclude that the statistical information given by the measurement of the BI distribution give an interesting insight in the dynamics of the advantages of a country in their international trade.

Siggel (2006) did a survey of all the views on competitiveness and comparative advantage in his article *International Competitiveness and Comparative Advantage: A Survey and a Proposal for Measurement*. In it he discussed that the Balassa's RCA or BI is the most popular method for measurement. However, he points out that the RCA actually measure competitive advantage instead of comparative advantage. This is because that the RCA is calculated by the export performance of a country and thus there may be distortions included in the calculations. Instead he mentions the DRC as the method to be used in order to look at comparative advantage of a country. This he shows by deriving the DRC through the Ricardian model of comparative advantage.

### 3.3.3 Domestic resource cost

“The concept of DRC relates to a measure of real opportunity cost in terms of total domestic resources, of producing (or saving) a net marginal unit of foreign exchange” (Bruno, 1972:16).

The domestic resource cost (DRC) was developed by Bruno in the 1960s (Masters and Winter-Nelson, 1995). The initial use of the DRC was to see what the gains were from the expansion of a profitable project. The evaluations of the profitable projects were measured initially in Israel in the 1960s by Bruno (Warr, 1983). It has since then gone from being used for project evaluation to be used by trade theorists in order to assess comparative advantage. The DRC is also used as an indicator to see if the private sector industries of a country are efficient (Fane, 1995).

Developing countries use the DRC frequently as an indicator for comparative advantage and as a guide for policy reforms (Masters and Winter-Nelson, 1995). It is also used in order to see how competitive a country is in the production of a commodity (Gorton and Davidova, 2001).

$$\text{DRC} = \frac{\text{Value added domestically in terms of opportunity costs}}{\text{Value added in border prices}}$$

By calculating the DRC it will take on different values which can be interpreted in order to see if the commodity produced has a comparative advantage or disadvantage:

- $DRC > 1$ : Comparative disadvantage exists.
- $DRC < 1$ : Comparative advantage exists.

## 4 Results

This chapter will present the trade of FYROM, international wine sector and FYROMs wine sector. The calculations of the BI will also be presented as well as numbers for the trade flow of wine from FYROM. The wine sector is then put into respect of Porter's *Diamond of National Advantage*.

### 4.1 Trade policy and trade flow in FYROM

Since 1992, FYROM has been undergoing a transition and are to some extent still undergoing it today (Roceska and Kostoska, 2006). The transition began with trade liberalization for the country and is still set on a path for WTO accession. Today FYROM is trying to integrate itself with the EU and is on the path to EU accession. The transition has had a large impact on the economy of FYROM, some of which are: a narrow domestic market, reduced purchasing power of the population, high level of import dependency, economic and political crisis and a very poor institutional infrastructure.

Due to the problems that arose from the transition, the export share of the GDP for FYROM has been low (Roceska and Kostoska, 2006). The enterprises in FYROMs economy have also experienced an enlarged external competition because of the foreign trade liberalization.

The trade between EU and FYROM is regulated by trade quotas, since FYROM signed the Stabilization and Association Agreement in 2001 (www, KSV, 2011). Since then, duty-free exports of industrial and agricultural products to EU market have been possible for FYROM, with the exception of three products: veal, fish and wine. FYROM can export the products by an annual quota set up by the EU.

*Table 3. The Major trading partners of FYROM (value in thousand EUR). Source: (www, KSV, 2011)*

	2007	2008	2009
<b>EU-27</b>	1 617 350	1 599 210	1 082 170
<b>Germany</b>	365 740	381 850	323 800
<b>Italy</b>	255 320	219 250	155 470
<b>Bulgaria</b>	177 300	253 500	154 050
<b>Slovenia</b>	50 470	43 760	24 440
<b>Romania</b>	14 040	22 400	14 090
<b>Switzerland</b>	7 860	10 880	12 270
<b>Slovakia</b>	4 420	8 110	8 580
<b>Czech Republic</b>	8 180	9 700	6 660
<b>Poland</b>	8 130	11 360	5 850
<b>Hungary</b>	4 910	4 840	2 710
<b>Other</b>	693 406	892 590	459 930
<b>Serbia</b>	469 170	613 380	246 440
<b>Croatia</b>	119 740	155 520	110 050
<b>Bosnia &amp; Herzegovina</b>	64 740	71 060	61 850
<b>Montenegro</b>	20 320	26 050	17 760

As can be seen in the table above, FRYOM main exports go to the EU-27. However, there is a decrease in exports to almost all countries between the years of 2008 and 2009.

One of the largest exported commodities of FYROM is wine, after tobacco and tobacco products (Dimitrievski et al, 2010). Below a table is presented that shows different countries that import the most of wine produced in FYROM.

*Table 4. Main importers of wine originating from FYROM (quantity in tones and value in 1000\$). Source: (www, FAO, 2, 2011)*

	2005		2006	
	Wine (Quantity)	Wine (Value)	Wine (Quantity)	Wine (Value)
<b>Albania</b>	251	322	210	353
<b>Bosnia &amp; Herzegovina</b>	230	358	347	685
<b>Bulgaria</b>	3084	1133	5782	2429
<b>Canada</b>	224	149	116	82
<b>Croatia</b>	7513	6522	9889	8633
<b>Czech Republic</b>	2138	920	24937	15229
<b>Germany</b>	<b>37828</b>	<b>16288</b>	<b>35015</b>	<b>13839</b>
<b>Japan</b>	361	293	305	195
<b>Russian Federation</b>	503	351	4510	1472
<b>Serbia &amp; Montenegro</b>	11874	8155	-	-
<b>Slovenia</b>	1095	812	891	732
<b>Sweden</b>	13	27	0	1
<b>USA</b>	115	235	95	224

As can be seen in the table above, the main importers of wine from FYROM are Germany followed by the WBCs and the Russian Federation. The interesting part is that there is a difference between the quantity imported and the value of it, especially between the WBCs and the western countries. For example in year 2005, Albania imports 251 tons at the value of \$322 000 while Canada imports 224 tons at a value of \$149 000. This can be explained by the fact that the main exports of wine from FYROM to western countries and others are in bulk which is wine with a lower quality (www, FAO, 1, 2011).

To see the quality of the exports of wine from FYROM the calculation of the export unit value has been used. Export unit value can be used to compare the quality of a product exported by comparing exports originating from different countries to one importer. Due to Germany being one of the largest export markets of wine from FYROM, it has been used as the comparative market for the export unit value for FYROM, Bulgaria, Croatia, France and Italy. The calculations show that FYROM has the lowest quality wine exported to Germany in comparison to the other countries. Croatia and France have the largest quality wine being exported to Germany of the comparing countries. The calculations can be found in appendix F. The export unit value for all of the comparing countries is presented in table 5 below.



Table 5. Export unit value. Source: (www, UNcomtrade, 2011) Note: Own calculations. In 2008 there were no values found for FYROM.

	<b>FYROM</b>	<b>Bulgaria</b>	<b>Croatia</b>	<b>France</b>	<b>Italy</b>
<b>2002</b>	0,307	0,577	1,526	2,125	1,236
<b>2003</b>	0,399	0,789	2,379	2,588	1,646
<b>2004</b>	0,459	0,91	3,151	2,86	1,727
<b>2005</b>	0,43	0,915	3,224	3,045	1,553
<b>2006</b>	0,395	0,973	3,573	3,085	1,384
<b>2007</b>	0,435	1,182	4,004	3,304	1,647
<b>2008</b>	-	1,539	4,616	4,078	1,968
<b>2009</b>	0,505	1,497	4,736	3,655	1,7

The total export unit value has been calculated for FYROM as well in order to show a positive trend in the quality of wine exported. In table 5 below, the total export unit value is presented. Although the trend is positive for FYROM there are still room for further quality improvements when comparing to France. The total export unit value for France is presented in table 6 below.

Table 6. Total exports and export unit value of wine from FYROM (value in \$ and quantity in kg). Source: (www, UNcomtrade, 2011) Note: Own calculations.

	<b>Value</b>	<b>Quantity</b>	<b>Export unit value</b>
<b>2002</b>	28 172 420	55 127 076	0,511045
<b>2003</b>	28 172 420	55 127 076	0,511045
<b>2004</b>	32 620 989	56 758 639	0,574732
<b>2005</b>	36 237 302	66 350 760	0,546148
<b>2006</b>	45 122 449	83 783 846	0,538558
<b>2007</b>	60 054 449	92 959 186	0,64603
<b>2008</b>	-	-	-
<b>2009</b>	52 820 032	68 770 159	0,768066

Table 7. Total exports and export unit value of wine from France (value in \$ and quantity in kg). Source: (www, UNcomtrade, 2011) Note: Own calculations

	<b>Value</b>	<b>Quantity</b>	<b>Export unit value</b>
<b>2002</b>	5 393 313 574	1 638 101 650	3,29
<b>2003</b>	6 603 605 815	1 553 753 421	4,25
<b>2004</b>	6 919 139 484	1 439 175 989	4,81
<b>2005</b>	6 961 912 450	1 410 378 298	4,94
<b>2006</b>	7 830 415 090	1 465 549 941	5,34
<b>2007</b>	9 279 545 137	1 517 600 810	6,11
<b>2008</b>	10 060 794 296	1 368 977 986	7,35
<b>2009</b>	7 690 812 934	1 252 645 037	6,14

## 4.2 International wine sector

For most of the countries around the world, there is only one species of grapes in use in the production of wine namely *Vitis vinifera* (www, FAO, 1, 2011). In some CEE countries there can be some other species found, but they unfortunately produce a lower quality wine. The quality and quantity of the wine produced are influenced by three key factors; climate (grapes need a certain climate condition in order to grow), soil (the structure of the soils is important for the vines) and viticulture practices (different parameters for a “good” growth of vines and grapes).

The cost of planting new vines on 1 ha of land differs significantly around the world (www, FAO, 1, 2011). The differences are partially explained by different soil and landscape between countries. In Europe it cost between 20 000 and 25 000 EUR to plant 1 ha of vines. In the cost, everything from material to all the operations needed during the four years it takes for a vine to produce grapes with the right quality is included.

Since the 1970s there has been a slow decline of the surface of vineyards in the world (www, OIV, 2011). Between the years of 1998-2000, there was an increase of vineyards in the world but has after that been declining again. In Europe, let alone, there has been a steady decrease of vineyards since the year of 2000. This is mainly caused by an uprooting of old vines in Europe, which the New World producers<sup>5</sup> cannot make up for in plantation of new vines (www, FAO, 1, 2011). However, Europe still has the leading market share of wine and grapes produced in the world. The latest figure for the total surface of vineyards is from 2007 and was 7.792 mha<sup>6</sup>.

Despite the decrease in surface of vineyards, there has been an increase in the production of grapes around the world since the 1990s (www, OIV, 2011). This is explained by an increase in the yields of grapes that in turn is explained by a new geographical distribution of vineyards around the world to more favorable locations. Even though there has been an increase in the production of grapes, there has been a slow decrease in the production of wine throughout the world. In 2007, the wine production for the whole world was 265.9 mhl<sup>7</sup>.

Table 8 shows all the large wine exporting countries in the world. France, Italy and Spain are the largest exporters of wine in the world. They are followed by the New World producers of wine, Australia, Chile and USA. FYROM is between New Zealand and Croatia in the table.

Out of the countries chosen for a comparison, France and Italy are the ones that export the most wine. During the years 2004 to 2008, Bulgaria exported more wine than FYROM. However, during the last years (2007 to 2009), the exports have decreased for Bulgaria. In 2009, FYROM was exporting more wine than Bulgaria. Croatia has been exporting the least wine of all the comparing countries, and the exports have also been decreasing during the years shown in the table.

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<sup>5</sup> New World producers are countries from South America, America, South Africa and Oceania.

<sup>6</sup> Million hektar

<sup>7</sup> Million hekto liter

Table 8. Exports of wine in the world (values in kg). Source: (www, UNcomtrade, 2011).  
 Note: There were no values found for either USA or FYROM for the year of 2008.

	2004	2005	2006	2007	2008	2009
<b>France</b>	1 426 879 255	1 385 191 839	1 465 549 941	1 517 600 810	1 368 977 986	1 252 645 037
<b>Italy</b>	1 426 976 773	1 609 791 731	1 830 247 042	1 882 650 356	1 806 681 608	1 951 893 491
<b>Spain</b>	1 458 070 801	1 417 832 524	820 914 484	1 543 554 301	2 408 085 139	1 493 185 068
<b>Australia</b>	646 160 603	695 667 781	762 471 902	782 018 298	701 076 020	771 983 633
<b>Chile</b>	473 998 265	421 087 253	475 539 886	611 046 183	589 932 048	694 429 195
<b>USA</b>	391 598 721	348 169 047	377 642 020	423 834 789	-	398 270 878
<b>Portugal</b>	321 452 092	258 278 705	286 328 075	341 124 029	286 722 190	231 184 102
<b>Moldova</b>	294 403 258	321 548 731	194 628 513	105 324 360	119 267 815	96 330 071
<b>Germany</b>	271 309 384	290 223 851	320 163 229	345 032 898	358 515 151	350 429 436
<b>South Africa</b>	261 387 482	349 396 219	272 596 706	500 820 330	433 084 085	429 336 718
<b>Bulgaria</b>	92 342 767	114 265 181	112 845 189	114 252 343	88 006 775	53 806 292
<b>Argentina</b>	81 344 335	220 758 459	299 209 789	362 499 231	429 494 047	294 590 960
<b>New Zealand</b>	75 809 994	57 385 250	64 731 753	84 134 807	98 721 223	128 513 975
<b>FYROM</b>	20 269 021	65 992 434	83 287 828	92 508 078	-	68 398 544
<b>Croatia</b>	5 006 309	2 855 566	3 020 570	3 006 352	2 635 990	2 603 331

It is interesting to compare table 8 above and the export unit value presented in table 5. Croatia is not exporting as much wine as FYROM, despite this, they have a very large export unit value compared to FYROM, Bulgaria and Italy. Another interesting point to make is that even though the exports have decreased for Bulgaria in the past three years, its export unit value has increased for all of the years. This is clarified in table 9 below.

Table 9. Export unit value and wine exports. Source: (www, Uncomtrade, 2011)  
 Note: Own calculations of export unit value.

	FYROM		Bulgaria		Croatia	
	<i>EUV</i> <sup>8</sup>	<i>Wine exports</i>	<i>EUV</i>	<i>Wine exports</i>	<i>EUV</i>	<i>Wine exports</i>
<b>2004</b>	0,459	20 269 021	0,91	92 342 767	3,151	5 006 309
<b>2005</b>	0,43	65 992 434	0,915	114 265 181	3,224	2 855 566
<b>2006</b>	0,395	83 287 828	0,973	112 845 189	3,573	3 020 570
<b>2007</b>	0,435	92 508 078	1,182	114 252 343	4,004	3 006 352
<b>2008</b>	-	-	1,539	88 006 775	4,616	2 635 990
<b>2009</b>	0,505	68 398 544	1,497	53 806 292	4,736	2 603 331

<sup>8</sup> Export unit value

### 4.3 Wine sector of FYROM

FYROM have more than 28 000 ha of vineyards (UNECE, 2002). In the WBCs and the ETCs<sup>9</sup> together there is an approximate total of 500 000 ha of vineyards (www, FAO, 1, 2011). The total amount of vineyards in the WBCs and ETCs only account for 7 % of the total surface of vineyards in the world. The Republic of Moldova is the country that has the largest share of vineyards of the WBCs and the ETCs.

Out of the 28 000 ha of vineyards in FYROM, 64 % of them is owned by small private producers (UNECE, 2002). This number have in the recent years increased due to an increase in wineries in the country (www, FAO, 1, 2011). In 2003 there were 28 registered wineries in FYROM, in 2009 they had increased to 45. Even though there has been an increase of wineries in the country, there has been a decrease in the total area of vineyards in the country.

*Table 10. The change in area of vineyards in FYROM. Source: SSO*

	<b>Vineyards in ha</b>	<b>% change</b>
<b>2003</b>	25 692	-
<b>2004</b>	24 777	-6.4
<b>2005</b>	25 044	+1.1
<b>2006</b>	24 266	-3.1
<b>2007</b>	24 584	+1.3

As can be seen above, there has been a steady decrease of ha of vineyards in FYROM. Despite there being small increases, the negative percentage change is larger than the positive.

*Table 11. The age of the vineyards in FYROM. Source: (www, AgBiz, 2011)*

<b>Age range</b>	<b>% of total area</b>
< 5	8 %
<b>5 to 10</b>	14 %
<b>10 to 15</b>	17 %
<b>15 to 20</b>	23 %
<b>20 to 25</b>	18 %
> 25	20 %

The table above shows that there is a large amount of vineyards that are very old in FYROM. Around 38 % of the vineyards in FYROM are in their end of production cycle, and need to be uprooted and replanted with new vines (www, AgBiz, 2011). The plantations of new vines is needed to be done, otherwise there cannot be a quantitative or qualitative production of grapes in FYROM in the future.

The plantation of new vineyards in FYROM is however a slow process because of three major issues:

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<sup>9</sup> Early Transition Countries or Former Soviet Union

- **Few vine distributors and a weak control of vines that are being sold.** In FYROM and the other WBCs and ETCs there is a reconstruction of the vineyards (www, FAO, 1, 2011). The countries are uprooting their vineyards and are on their way to plant new vineyards with grapes that are demanded on the international market. Unfortunately, there are few suppliers of different grape varieties in the countries and there is a poor control if the vines are virus free.
- **The trouble of assessing loans to plant new vineyards.** The local governments of the WBCs and ETCs encourage producers to plant more vineyards, and some provide subsidies for it (www, FAO, 1, 2011). In FYROM, the Ministry of Agriculture decided to assist the plantation of 1 800 ha of vineyards in the country with a budget of 2.5 million EUR. Despite the large budget, it will only cover 14 % of the costs. There is then a need for a loan from a bank, this is however hard because of the difficulty of assessing collateral. In a normal case, a farmer could use land as collateral. This is however difficult, instead they have to use other fixed assets such as machinery and buildings.
- **The problem of land fragmentation and the privatization of the wine sector.** When land was privatized in FYROM, it was divided between large amounts of farmers, so the vineyards were very small for them (www, FAO, 1, 2011). In FYROM the vineyards was about 0.5 ha in size and they were mainly producing wine for home consumption.

The problem of not having the option to use land as collateral have been worsened because of the privatization and land fragmentation (www, FAO, 1, 2011). This is partly because of the majority of vineyards being owned by private farmers that produces grapes and 30 % of the vineyards being owned by wineries. However, in recent years, there has been a change in the market structure and more and more wineries buy their own land for the production of grapes. This is done in order for the wineries to secure a quality of the grapes grown, and later the wine produced.

Grape production in FYROM is mainly of local varieties (www, FAO, 1, 2011). The Vranec grape is the one produced the most in the country and is planted on 50 % of the vineyards total surface. In recent years there has been an increase in the plantation of foreign vine varieties in order to make more exports of quality wine (UNECE, 2002) and to meet the demand of foreign markets (www, FAO, 1, 2011). However, there is a lack of knowledge in the production of grapes in respect to international standards, and therefore there is still an absence of quality in the wine produced (ibid.). The production of wine is mainly influenced by old traditions which see quantity as greater factor than quality. There is also a lack of funds in order to send researchers and professors overseas to study how international wineries assess quality in their wine.

For many of the WBCs and ETCs with FYROM included, there is no domestic manufacturer of machines or equipment for the production of wine (www, FAO, 1, 2011). Instead, much of it has to be imported. The quality of the wine can therefore be inconsistent because of a lot of the machinery and equipment in use is either being old or old-fashioned.

Lately the government of FYROM is in the process of building a functioning computer system for the control and management of the cadastre of the vineyards in the country with the help of the EU and the ministry of agriculture (www, EC, 2011). The system will be in EU standard and will satisfy Eus export requirements, such as the information about where the production is originating from. The system will also be able to monitor the production potentials in FYROM and will be a starting point for the establishment of a quality control system in the future.

Below is a graphical presentation and map over the different provinces in FYROM that have vineyards and at what amount and the distribution of them.

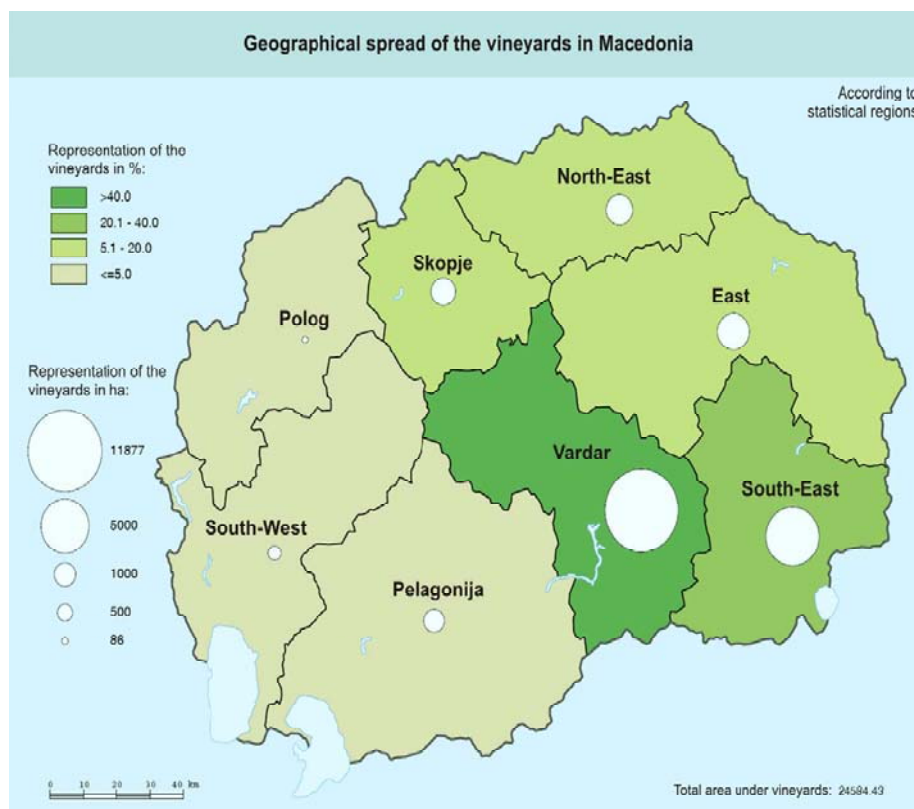


Figure 4. Map over provinces and their vineyards in FYROM. Source: SSO

As is shown and proven above in the map, the province of Vardar is the one that has the most vineyards in the country (more than 40 %). Vardar is the name of FYROMs largest river that flows through the whole country, from the north (Prolog and Skopje provinces) to the south (Vardar province) and continue into Greece.

In the Vardar province, agriculture specialized in vegetables and fruits, including grapes, have been produced for a long time (UNECE, 2002). This is because there are two large basins of water in the province that have been beneficial for production. In the province are the largest wineries situated, one of them is Tikves winery, which is the largest winery in FYROM in respect to market share of the domestic market and share of surface area in use for the production of grapes. Tikves also have the largest market share of exports, 62 %. 40 % of the exports go to Germany alone.

### 4.3.1 Balassa Index

In this subchapter, the calculations of the BI will be presented in order to see if the wine production in FYROM has a comparative advantage (RCA) or not.

*Table 12. Balassa Index. Source: (www, FAO, 2, 2011) Note: Own calculations*

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Bulgaria</b>	5.75	3.95	4.3	3.73	2.59	2.63	2.3	2.34	2.79	2.31	1.47
<b>Croatia</b>	0.73	0.65	0.61	0.62	0.59	0.51	0.58	0.38	0.35	0.38	0.39
<b>France</b>	4.89	4.93	4.95	5	4.83	4.71	5.54	4.72	4.98	5.03	5.27
<b>Italy</b>	4.67	4.59	4.63	4.77	4.61	4.45	4.45	4.65	4.66	4.81	5.11
<b>FYROM</b>	2.79	3.98	4.56	4.71	4.08	3.66	3.83	3.39	3.67	5.91	3.76

In the table above are the Balassa Indexes presented. The countries have earlier been chosen in order to compare them with FYROM. As can be seen in the table, FYROM has a higher BI than Croatia for all the years calculated. FYROM also has a higher BI than Bulgaria for the years between 1999 and 2008. However, France and Italy have a higher BI than FYROM for all the years except for 2007. FYROM is though in a close proximity of Italy in the years of 2000 and 2001.

In appendix C, the cross-country BI is attached. When a cross-country analysis is done, it is only done between two countries, not one compared to the world as it is done in the table above. The cross-country analysis however show similar outcome as the BI but with some small changes. In the cross country analysis, FYROM has a comparative advantage against Croatia for all years calculated, and for the years between 1999 and 2008 in respect to Bulgaria. The small changes are that FYROM has a greater comparative advantage in respect to Italy in the years 2001, 2002 and 2007. When looking at the difference between France and FYROM, there is only one year that FYROM has a larger comparative advantage than France and that is in 2007.

For a more clarified picture of how the Bis differ from a country to another and a year to another, they are presented in two figures below. Figure 3 show the Bis for France, Italy and FYROM and figure 4 show the Bis for Bulgaria, Croatia and FYROM.

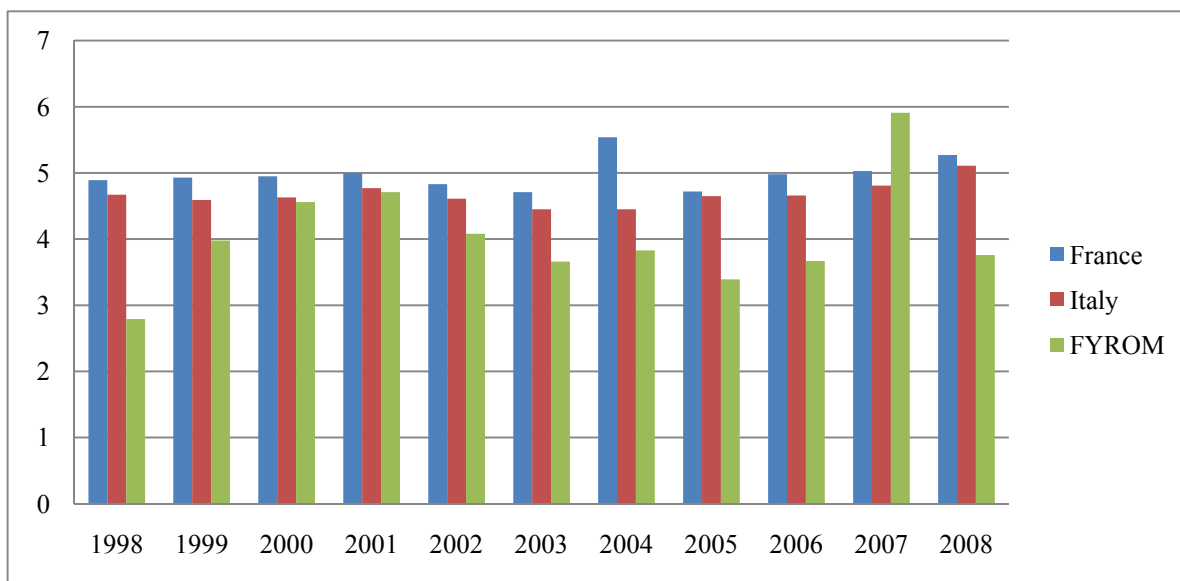


Figure 5. Balassa Indexes for France, Italy and FYROM over a ten-year period. Source: (www, FAO, 2, 2011) Note: own calculations

Figure 3 gives a clear picture of how FYROMs BI changes from year to year, and seems to be increasing and is there after decreasing. For France and Italy, their Bis are not changing so much over the years.

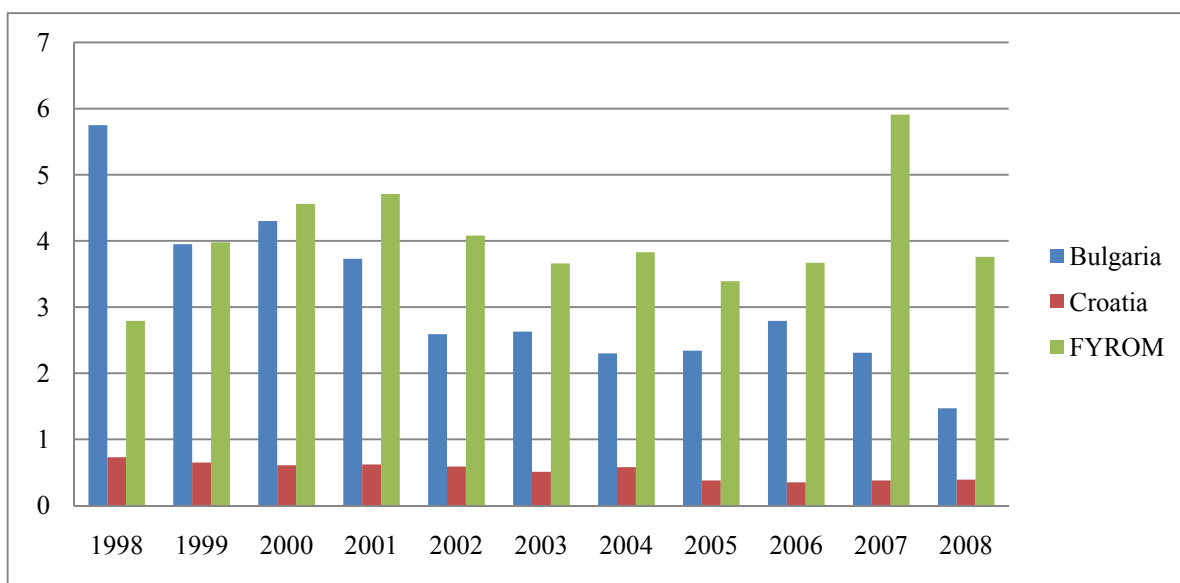
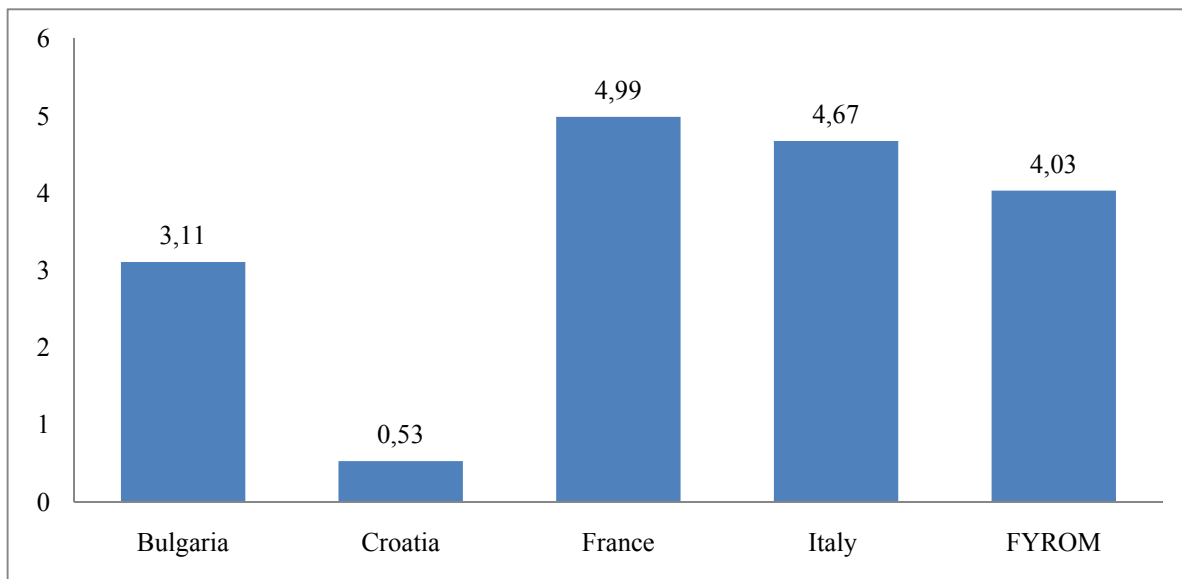


Figure 6. Balassa Indexes for Bulgaria, Croatia and FYROM over a ten-year period. Source: (www, FAO, 2, 2011) Note: own calculations

Figure 4 present the same picture for the Bis for FYROM, where they both increase and decrease. For Bulgaria however, the BI seem to be steadily decreasing over the years, while for Croatia the Bis are low and below one for all of the years.





*Figure 7. The mean of the Bis for (1998-2008). Source: (www, FAO, 2, 2011) Note: own calculations*

In the literature review it is stated that a country has a comparative advantage if they have a BI that is greater than one. In figure 5 above, it is clearly shown that four countries have a comparative advantage in the production of wine, namely Bulgaria, France, Italy and FYROM. Croatia however does not have a comparative advantage in the production of wine due to their BI being lower than one. Another thing that is mentioned in the literature review (chapter 3.3.2) is that it is problematic to compare the BI between countries. Therefore the best way to address the problem is to only state that FYROM has a comparative advantage based on the theoretical concept of the BI. The same accounts for France, Italy and Bulgaria, but not for Croatia.

## 4. 4 FYROMS National Diamond

With a relatively small domestic market size FYROM needs, among other things, to further expand their market outside their borders for further growth and attraction of foreign investors. The local market is at only around the 2 million inhabitants of FYROM. Before the collapse of the Republic of Yugoslavia the wine industry supplied wine to all of the approximately 20 million inhabitants of the Republic, but since the early 90's these exports have stopped. To see the capacity of the wine industry's innovation and growth the use of Porter's National Diamond is implemented, where an analysis of the four different attributes of the Diamond are presented.

### 4.4.1 Factor Conditions

Critical points of competitiveness concern the factors of production. There has to be a resource and a workforce to work with the resource. There is also a need for infrastructure and capital to fund the production and innovation.

FYROM has since its independence been battling high unemployment rates and very low employment rates (Kjosev, 2007). Today the unemployment rates are at 33%, reaching the second highest official unemployment rates in the world, after Kosovo (www, World Bank, 2011). There would seem to be a great availability of labor in FYROM, but the education level of the possible workforce is not high. In the GCR 2010-2011, FYROM received a ranking of 61<sup>st</sup> in *Quality of math and science education*, and a ranking of 75<sup>th</sup> in *Quality of management schools*. The ranking was of 139 countries, which puts FYROM in the middle segment of the higher educations. It is also shown that the ranking for *Local availability of research and training services* is low at 102<sup>nd</sup>. In the survey for most problematic factors of doing business *Inadequately educated workforce* and *Poor work ethic in national labor force* are listed among the highest. For the wineries there is a great need for knowledge in science and research to reach the standards of what the consumers might prefer.

The infrastructure in FYROM is poor. In the GCR 2010-2011 the *Overall Infrastructure* ranking is as low as 91<sup>st</sup>, *Quality of Roads* is 99<sup>th</sup> and the *Quality of Railroads* is 81<sup>st</sup>. In the survey of problematic factors for doing business *Inadequate supply of Infrastructure* is listed as the fifth most problematic factor in FYROM.

FYROM has a long tradition of wine making. There has been wine production there since long before the Roman Empire. The basic resource of wine is the grape, of which FYROM has a great availability of. The grapes are grown in vine plantations and vineyards. The conditions for growing grapes in FYROM are very good, with hot dry summers and rocky slopes for the vines to grow (www, Bloomberg Businessweek, 2011).

There is a need to restructure most of the vineyards in respect to their vines and rootstocks. Most of them grow grapes from old vines that are not adapted to the market demand and preferences. The market for rootstocks is growing within the EU, but in most of the Balkan countries these suppliers are poorly organized and there is a risk of getting virus infected or even falsified rootstocks. Therefore the government of FYROM has regulated the industry and is now encouraging sales of approved rootstocks and grape vines (www, FAO, 1, 2011).

Investments in local vineyards are risky, since there is a risk of production with uncertified grape varieties and rootstocks. Therefore financing for the restructuring of the vineyards is hard to come by. After renewing the plantations the first harvest can be done after four years, with a general 5-10 years until the grapes reach optimum quality. The cost of planting, operations, equipment and material of 1 ha during these first four years in FYROM is between EUR 7.000 – 7.500, a big investment with uncertain results until the fourth year (www, FAO, 1, 2011). The Ministry of Agriculture in FYROM decided to provide financial assistance for the renewing of the rootstocks, but it only covered around 14% of the total costs for the first four years. A bank loan would then be required, but the collateral demanded by the banks is in most cases difficult to provide. The producers would then need outside investors to cover a big part of these costs. In the Global Competitiveness Report<sup>10</sup> (GCR) 2010-2011 a survey has been done asking for the most problematic factors for doing business in FYROM, where access to financing was reported to be the second most problematic factor.

The number of vineyards increased from 28 in 2003 to 45 in the beginning of 2007 (www, FAO, 1, 2011). The increase in vineyards was almost wholly due to investors from businesses outside the wine industry, not due to grape growers who wanted to expand their businesses. This was mostly because of the fact that financing is hard to access for the grape growers, they cannot provide collateral and have a hard time to provide the cash flow needed the first years, with investments in equipment. The outside investors tend to mostly focus on high quality wine, which leads to better vineyard management, better production technologies and sophisticated marketing strategies.

#### 4.4.2 Firm strategy, structure and rivalry

In a company there has to be a professional management with business know-how, alliances within the industry where ideas can be traded, and rivalry amongst the businesses for the industry to be able to grow and innovate.

The climate for starting a company in FYROM is relatively good. In the GCR 2010-2011 the *Number of procedures required to start a business* received a ranking of 14<sup>th</sup>, and *Time required to start a business* received a ranking of 6<sup>th</sup>. The creation of businesses is important to uphold the rivalry in the industry for further innovations and technological improvements. The *Total tax rate* is also ranked high, at 10<sup>th</sup> place, which is beneficial for the businesses. More specific for the wine sector the *Agricultural policy costs* received a ranking of 33<sup>rd</sup> that puts FYROM in the lower half of the list.

Within the companies, management and staff training are important aspects. Both of these received a low ranking in FYROM, with *Reliance on professional management* ranked at 115<sup>th</sup>, and *Extent of staff training* ranked as low as 119<sup>th</sup>.

There are a small number of grape wine producers on the market, only 45 companies (www, FAO, 1, 2011). As a result, only a few dominate the market. The largest one is Tikvesi, with

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<sup>10</sup> Global Competitiveness Report is a yearly report published by the World Economic Forum. It contains research based on 12 pillars of competitiveness compiling a comprehensive picture of the economic landscape in the presented countries. For the issue of 2010-2011 there were 139 countries included. The complete list of GCR for FYROM can be found in appendix D.

a 30% market share. On the other hand there are many grape growers, around 25.000 growers cultivate around 25.000 ha of land. With this structure there is a risk of conflicts between the big producers and the small growers. This might lead to the producers buying their own land to grow their own grapes instead of cooperating with the growers.

With a small number of wineries the competition within the wine industry is not very good. The overall ranking by the GCR 2010-2011 for *Intensity of local competition* is at 96<sup>th</sup>. But with the current climate for start up businesses this might change in the future.

In FYROM many of the quality wine makers have organized themselves in the National Alliance of Wineries (www, FAO, 1, 2011). The alliance allows them to better protect their interests and develop common action plans. Within the alliance there can also be transfers of know-how and strategies. It also gives them the ability to act as a counterpart to the government when having discussions about the future strategies of the industry.

The government of FYROM aligned their wine production standards with EU regulations, complying with the rules of oenological<sup>11</sup> substances and practices (www, FAO, 1, 2011). This was done so that FYROM under the precondition of exports could export wine under a zero-duty tariff quota. This is a good strategy that might also help for the future accession into the EU. This will also assure consumers on external markets that the wine has been produced in a good manner.

#### 4.4.3 Demand Conditions

It is important with a strong domestic demand with a sophisticated home-market. The buyers can then indicate emerging needs and pressure the companies to higher standards and faster innovation.

The market size for wine in FYROM is not very big, only around 2 million inhabitants. Although this might be enough, many of the inhabitants of FYROM produce their own wine privately (www, FAO, 1, 2011). In the GCR 2010-2011 the *Domestic Market Size Index* received a ranking of 108<sup>th</sup>.

Because of the home production of wine the sophistication of the consumers in FYROM is not that high when it comes to wine. Most of the wine consumed locally is also bought from local bazaars, where the wine has been produced, and is of low quality (www, FAO, 1, 2011). In the GCR 2010-2011 the *Degree of Customer Orientation* received a ranking of 74<sup>th</sup>, while *Buyer Sophistication* was ranked at 110<sup>th</sup>.

#### 4.4.4 Related and supporting industries

There is a need for effective and cost efficient supporting industries for the wine sector in FYROM to be able to expand and reach a higher level of sophistication. Related industries are also important for the sector for it to reach a comparative advantage.

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<sup>11</sup> Oenology is the science and study of all aspects of wine and winemaking

In the GCR 2010-2011 the *Local Supplier Quality* in FYROM is ranked as low as 83<sup>rd</sup>. For the industry to be able to grow the suppliers need to improve their quality. A competitive and innovative supplier will supply the most cost efficient products and qualitative products.

FYROM has great potential in tourism. It has a long and eventful history and many sights to visit. The tourism industry and the wine industry have long been connected and affect each other (Hall, 2000). Wine can make a destination attractive for tourists, while the tourism might generate personal relationships between the wine makers and the tourists. The tourists can in firsthand experience the wine and buy it from the local wineries. Positive reactions might generate a greater amount of tourists to FYROM and its vineyards.

There is no local production of wine bottles in FYROM (Cassel, 2006). Therefore these are imported mostly from Croatia and Bulgaria. A local production of wine bottles could bring an advantage to the wine sector in FYROM, due to the decrease in imports and costs. This could give the wineries an opportunity to lower their prices of the wine to the consumers.

There are two public research institutions in the wine sector, the Department of Viticulture and Oenology at the Skopje University and the Institute for Grape Growing and Winemaking (Cassel, 2006). These public institutes do not work closely with the private wine sector, leading to the research and training programs not always corresponding to the needs of the wine companies.

## 5 Analysis and discussion

This chapter will address and answer the questions stated in chapter one. The answers will be answered by the theoretical framework presented in the literature review and the empirical research presented in the chapter of results.

The questions stated in chapter one are:

- **Does FYROM have a comparative advantage in respect to other countries that produce wine**
- **and how can FYROM sustain its comparative advantage and/or competitiveness against other wine producing countries?**

The comparing countries are Bulgaria, Croatia, France and Italy.

### 5.1 The comparative advantage of FYROM

In chapter 4 the calculations of the Balassa Index show that FYROM has a comparative advantage in the production of wine. FYROM has a higher BI than Croatia and Bulgaria, while they do have a smaller BI than France and Italy.

It is interesting to know that FYROM has a greater BI than Bulgaria, the country that in 2007 joined the EU and its open market. FYROM have applied for EU membership and will sooner join and gain access to the open market and will then compete with countries such as Bulgaria, France and Italy. Bulgaria do export a larger share of wine than FYROM, however it seems (with the BI in consideration) that FYROM is more specialized in the export of wine or has a better export performance than Bulgaria.

However, FYROM may have a greater BI than Bulgaria and Croatia, but they have a greater export unit value than FYROM. This implies that the wine that is exported from Bulgaria and Croatia has a better quality than the wine exported from FYROM, to Germany.

Croatia was during the Yugoslavian era and thereafter one of the more industrialized and modern regions in the Yugoslavian republic (after Slovenia). It is therefore quite interesting to see that FYROM has a larger BI than Croatia. Croatia has a larger production of wine than FYROM, but a small share of it is exported and the exports have also fallen to a low level in comparison to FYROM. Most of the Croatian wine produced is consumed on the domestic market, which can be assumed by the tables in chapter 4 and is proven by Cacic et al (2010).

The “National Alliance of Wine Makers” in FYROM gives the quality producers an advantage in the way that they can trade know-how and ideas with each other. They can also indicate to where the market demands lie, and work together in making FYROM a wine country.

The high unemployment rates in FYROM give a great availability of workforce. Although the available workers might not be highly educated, one could argue that there are many positions in wine making that does not require earlier education, and instead could be taught on place.

One disadvantage is that FYROM has an unsophisticated local demand, which means that the producers cannot see firsthand market reactions on how they should focus and innovate their production to become attractive on foreign markets. The consumers, that often produce their own low quality wine or buy it at the local bazaar, do not indicate the sophisticated demand often required in the wine market.

The vines and grapes in FYROM are not adapted to today's market demands on the foreign markets. They are old and of a different kind than the ones demanded. Therefore a restructure of the vineyards is needed to meet the higher quality demands. The economic situation for the wine makers do not allow this restructure. This seems to be the greatest challenge and disadvantage for FYROM in the production of wine.

## 5.2 The ability for FYROM to sustain their competitiveness

As the results from the BI shows, it seems that FYROM has an ability to sustain their comparative advantage. It has gone up and down during the years, but has not been continually falling as it has done for Bulgaria. However, there is a need for caution of not comparing the BI between countries.

A few companies and farmers in FYROM are with the help of external investors responding to the trends and preferences of the European market and are therefore planting vines that are more common on the international market. This may be a positive outcome for them both in the future and the exports may increase due to people being familiarized with the grapes that the wine is produced of.

It is important that FYROM adapt the wine production towards the market demands. This process involves renewing vines and planting new species of grapes. If they manage to do this it may give them the ability to sustain their competitiveness or even strengthen it.

The Agricultural policy should be expanding their focus towards the wine sector in FYROM. It is one of the greatest agricultural exports of FYROM. For the producers to be able to renew their vineyards they are in need of additional support from the government.

FYROM may be joining the EU in the future and will thus be experiencing more competition from other countries that produce wine. Most of the transitional countries that later have joined the EU have experienced more and more imports than exports (Cacic et al, 2010). This may become true for FYROM as well.

The concept of Wine Tourism might be a helping hand for the industry as this might generate interest from consumers outside of FYROM. It is important for FYROM to attract tourism, not only for the wine industry, and wine tourism could be a great way of doing this. But first many more wineries need to position themselves as quality wine makers for there to be enough interest in going there instead of maybe Italy.

FYROM has very good conditions for making high quality wine. The soil, temperature and high altitude slopes in FYROM are perfect for producing wine. If these conditions do not change in the future, FYROM should be able to sustain their comparative advantage in the future.

The research made on wine and grapes in FYROM is not closely connected with the producers of wine. It is important that they work together so that the research is linked with the aims of the producers, and vice versa, for FYROM to be able to sustain their advantages in the production.



## 6 Conclusions

Based on the theoretical concept of BI, FYROM has a comparative advantage in their production of wine. The export performance of wine produced in FYROM is good and could be strengthened by an enhancement of quality of the wine produced. Although they have a comparative advantage in the production of wine and a greater BI than Bulgaria and Croatia, FYROM does not reach the same level of export unit value as the countries compared. The export unit value may become higher in the future, there is already a positive trend showing this, but the quality of the wine needs to be improved.

The vineyards in FYROM are old and outdated, and for them to be able to improve the quality of the wine there is a need to plant new vines. There is therefore a great opportunity for the farmers of FYROM to plant new vines with familiar grapes that are demanded on the foreign markets. For them to be able to accomplish this, the farmers are in need of support from the government. Financing from the financial market is hard to come by, and *Access to Financing* was described in the Global Competitiveness Report as the second most problematic factor for doing business in FYROM. The aid should not only be directed towards the plantation of new vines, but also towards equipment, machines and other quality enhancing materials for the farmers to meet the high costs of the renewing of the vineyards.

This has to be done so that FYROM does not keep their association as a bad quality wine producer. If they can lose this association, foreign wineries and investors might get interested in FYROM's wine sector.

With a high quality wine association of FYROM, the wine tourism might expand into the country. This would not only generate a greater general interest of FYROM's wine, but also benefit many other industries and the country as a whole.

For further research in this subject it would be interesting to examine and calculate the domestic resource cost, since it is not sufficient to only calculate the Balassa Index to strengthen the thesis of FYROM having a comparative advantage. It would also be interesting to visit FYROM and do empirical studies to see in firsthand the situation of the wine sector in FYROM.

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1. *Global Competitiveness Report 2010-2011, 2011-04-15*  
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# Appendix

Appendix A: Values and quantities of wine and agricultural products (1998-2008)

Appendix B: Balassa Index calculations (1998-2008)

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Appendix D: Global Competitiveness Indexes and Ranks (2010-2011)

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Appendix F: Export unit value (2002-2009)

## Appendix A: Values and quantities of wine and agricultural products (1998-2008)

### A.1. Values for Croatia

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Wine</b>	Production (tonnes)	227727	209404	189100	195200	209500	176800	197900	77300	75000	78000	77500
	Import Quantity (tonnes)	572	5322	2644	6405	7910	9155	13488	13393	14444	15566	14205
	Import Value (1000 \$)	641	2495	2366	4879	5992	10569	14892	15563	18864	26801	26915
	Export Quantity (tonnes)	8717	6590	7790	8859	10753	8145	4903	2863	3032	3030	2676
	Export Value (1000 \$)	9663	8657	7374	7925	9657	11634	12291	9845	11294	13658	13793
<b>Agricultural Products, Total</b>	Export Value (1000 \$)	433485	395751	377165	408776	499637	672615	658961	840125	1054112	1181069	1265381

Source: FAO

### A.2. Values for Bulgaria

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Wine</b>	Production (1000 tonnes)	195544	171451	183372	123015	114509	143835	194804	169445	173594	136953	230046
	Import Quantity (tonnes)	22548	13162	5530	1530	4030	1693	803	4848	22200	16894	6568
	Import Value (1000 \$)	10399	4588	2326	1087	1819	1386	1644	4173	14700	31311	16483
	Export Quantity (tonnes)	152559	97800	79300	79100	78784	83426	92342	114512	153895	113913	87045
	Export Value (1000 \$)	126581	81100	62869	66465	60798	69600	80189	93499	129736	118073	109134
<b>Agricultural Products, Total</b>	Export Value (1000 \$)	704482	609443	472368	583602	733427	798997	1065633	1266583	1497618	1637674	2820327

Source: FAO

### A.3. Values for France

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Wine</b>	Production (tonnes)	5427100	6293500	5754100	5338800	5000000	4749060	5910694	5344170	5349333	4711600	4198632
	Import Q. (42ones)	546916	561027	435013	511113	452827	469583	472765	544451	528685	526227	570018
	Import V. (1000 \$)	514566	507904	424097	424110	433665	514747	603053	594641	606335	734173	817136
	Export Q. (42ones)	1636460	1587820	1482510	1551660	1536880	1496240	1435040	1367840	1461660	1492930	1345510
	Export V. (1000 \$)	5890720	6101170	5044350	4787030	5397740	6562660	6919730	7014770	7820850	9254180	10000600
<b>Agri. Prod., Total</b>	Export V. (1000 \$)	38249342	36809549	32907687	31324624	34836080	42124740	46659495	47182279	50378331	58809607	68020466

Source: FAO

### A.4. Values for Italy

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Wine</b>	Production (tonnes)	5714040	5807280	5408752	5229300	4460413	4408611	5313517	5056648	4963297	4251383	4609554
	Import Q. (42ones)	86299	45560	56492	67989	82228	144668	162492	168701	146921	172400	63140
	Import V. (1000 \$)	196100	196756	184738	158867	192759	261938	308203	333873	361016	473015	478678
	Export Q. (42ones)	1519110	1831990	1467530	1537060	1518680	1280200	1435900	1552080	1793150	1826640	1733890
	Export V. (1000 \$)	2365200	2463770	2229580	2289080	2589930	2986470	3550370	3717970	4038410	4741610	5277540
<b>Agri. Prod., Total</b>	Export V. (1000 \$)	16087016	15919608	15602057	15684066	17451178	20643644	24421691	25311558	27809931	31571018	37074772

Source: FAO



### A.5. Values for FYROM

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Grapes</b>	Area Harvested (Ha)	28812	26900	26530	27800	27165	26530	25000	25000	25000	21312	21676
	Yield (Hg/Ha)	84536	85540	99606	82661	43806	89437	99069	106286	101723	98395	109260
	Production (tonnes)	243567	230104	264256	229800	119000	237279	247673	265717	254308	209701	236834
<b>Wine</b>	Production (tonnes)	122710	91187	96142	83000	44700	93038	105850	105000	70300	90840	108100
	Import Quantity (tonnes)	350	862	366	328	139	144	297	223	256	1808	1655
	Import Value (1000 \$)	310	404	286	201	158	220	419	344	534	3128	1330
	Export Quantity (tonnes)	57000	83176	82409	80553	72614	55127	56759	65590	82682	91021	70338
	Export Value (1000 \$)	25000	30871	28867	27951	26858	28172	32621	36122	44680	79763	57209
<b>Agri. Prod., Total</b>	Export Value (1000 \$)	283223	229921	204302	194020	205134	235122	259962	338491	390581	432467	542697

Source: FAO

## Appendix B: Balassa Index calculations (1998-2008)

### B.1. Values of the Balassa Index for Bulgaria, Croatia, France, Italy and FYROM

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Bulgaria</b>	5,75	3,95	4,3	3,73	2,59	2,63	2,3	2,34	2,79	2,31	1,47
<b>Croatia</b>	0,73	0,65	0,61	0,62	0,59	0,51	0,58	0,38	0,35	0,38	0,39
<b>France</b>	4,89	4,93	4,95	5	4,83	4,71	5,54	4,72	4,98	5,03	5,27
<b>Italy</b>	4,67	4,59	4,63	4,77	4,61	4,45	4,45	4,65	4,66	4,81	5,11
<b>FYROM</b>	2,79	3,98	4,56	4,71	4,08	3,66	3,83	3,39	3,67	5,91	3,76

Source: FAO

Note: Own calculations with the use of the BI, expression (1)

## Appendix C: Balassa Index cross-country analysis (1998-2008)

### C.1. Values of the cross-country BI for Bulgaria and FYROM

	Bulgaria		FYROM		World		$X_{ws}$	$X_w$	$BI_{(FYROM)}$		$BI_{(Bulgaria)}$
	Wine Exp. Value	Total Agri. Prod	Wine Exp. Value	Total Agri. Prod	Wine Exp. Value	Total Agri. Prod					
<b>1998</b>	126581	704482	25000	283223	13806905	437727189	13655324	436739484	2,823136894	<	5,746707184
<b>1999</b>	81100	609443	30871	229921	14077668	417162886	13965697	416323522	4,002583416	≥	3,966944228
<b>2000</b>	62869	472368	28867	204302	12704789	410996478	12613053	410319808	4,596542672	≥	4,329705382
<b>2001</b>	66465	583602	27951	194020	12670641	414342232	12576225	413564610	4,737442142	≥	3,745150776
<b>2002</b>	60798	733427	26858	205134	14206489	442610290	14118833	441671729	4,095781885	≥	2,593183199
<b>2003</b>	69600	798997	28172	235122	17317772	525080964	17220000	524046845	3,646375384	≥	2,650947058
<b>2004</b>	80189	1065633	32621	259962	19764843	607443140	19652033	606117545	3,870229968	≥	2,320900421
<b>2005</b>	93499	1266583	36122	338491	20655305	654088142	20525684	652483068	3,39231576	≥	2,346631624
<b>2006</b>	129736	1497618	44680	390581	22428554	721950701	22254138	720062502	3,701361214	≥	2,802972719
<b>2007</b>	118073	1637674	79763	432467	27240055	873286036	27042219	871215895	5,941990747	≥	2,322772141
<b>2008</b>	109134	2820327	57209	542697	29619992	1059857464	29453649	1056494440	3,781246974	≥	1,387997606

Source: FAO

Note: Own calculations with the cross-country BI, expression (2)

## C.2. Values of the cross-country BI for Croatia and FYROM

	Croatia		FYROM		World		$X_{ws}$	$X_w$	$BI_{(FYROM)}$	$\geq$	$BI_{(Croatia)}$
	Wine	Total	Wine	Total	Wine	Total					
	Exp. Value	Agri. Prod	Exp. Value	Agri. Prod	Exp. Value	Agri. Prod					
<b>1998</b>	9663	433485	25000	283223	13806905	437727189	13772242	437010481	2,800907056	$\geq$	0,707334943
<b>1999</b>	8657	395751	30871	229921	14077668	417162886	14038140	416537214	3,983972177	$\geq$	0,649067159
<b>2000</b>	7374	377165	28867	204302	12704789	410996478	12668548	410415011	4,577469187	$\geq$	0,63338554
<b>2001</b>	7925	408776	27951	194020	12670641	414342232	12634765	413739436	4,717485776	$\geq$	0,634853664
<b>2002</b>	9657	499637	26858	205134	14206489	442610290	14169974	441905519	4,083159951	$\geq$	0,602764979
<b>2003</b>	11634	672615	28172	235122	17317772	525080964	17277966	524173227	3,635018557	$\geq$	0,524740677
<b>2004</b>	12291	658961	32621	259962	19764843	607443140	19719931	606524217	3,859492093	$\geq$	0,573680729
<b>2005</b>	9845	840125	36122	338491	20655305	654088142	20609338	652909526	3,380754428	$\geq$	0,371245139
<b>2006</b>	11294	1054112	44680	390581	22428554	721950701	22372580	720506008	3,684033649	$\geq$	0,345050422
<b>2007</b>	13658	1181069	79763	432467	27240055	873286036	27146634	871672500	5,922238095	$\geq$	0,371320729
<b>2008</b>	13793	1265381	57209	542697	29619992	1059857464	29548990	1058049386	3,774593903	$\geq$	0,390301954

Source: FAO

Note: Own calculations with the cross-country BI, expression (2)

### C.3. Values of the cross-country BI for France and FYROM

	France		FYROM		World		$X_{ws}$	$X_w$	$BI_{(FYROM)}$		$BI_{(France)}$
	Wine Exp. Value	Total Agri. Prod	Wine Exp. Value	Total Agri. Prod	Wine Exp. Value	Total Agri. Prod					
<b>1998</b>	5890720	38249342	25000	283223	13806905	437727189	7891185	399194624	4,465333999	<	7,790886378
<b>1999</b>	6101170	36809549	30871	229921	14077668	417162886	7945627	380123416	6,423452365	<	7,929559816
<b>2000</b>	5044350	32907687	28867	204302	12704789	410996478	7631572	377884489	6,996391347	<	7,590194664
<b>2001</b>	4787030	31324624	27951	194020	12670641	414342232	7855660	382823588	7,020480878	<	7,447256176
<b>2002</b>	5397740	34836080	26858	205134	14206489	442610290	8781891	407569076	6,076439851	<	7,191108885
<b>2003</b>	6562660	42124740	28172	235122	17317772	525080964	10726940	482721102	5,391937448	<	7,010727781
<b>2004</b>	6919730	46659495	32621	259962	19764843	607443140	12812492	560523683	5,489689238	<	6,487979586
<b>2005</b>	7014770	47182279	36122	338491	20655305	654088142	13604413	606567372	4,75799411	<	6,628782345
<b>2006</b>	7820850	50378331	44680	390581	22428554	721950701	14563024	671181789	5,272185114	<	7,154821116
<b>2007</b>	9254180	58809607	79763	432467	27240055	873286036	17906112	814043962	8,384845587	≥	7,153790673
<b>2008</b>	10000600	68020466	57209	542697	29619992	1059857464	19562183	991294301	5,341856629	<	7,450265438

Source: FAO

Note: Own calculations with the cross-country BI, expression (2)

#### C.4. Values of the cross-country BI for France and FYROM

	Italy		FYROM		World		$X_{ws}$	$X_w$	BI <sub>(FYROM)</sub>		BI <sub>(Italy)</sub>
	Wine Exp. Value	Total Agri. Prod	Wine Exp. Value	Total Agri. Prod	Wine Exp. Value	Total Agri. Prod					
<b>1998</b>	2365200	16087016	25000	283223	13806905	437727189	11416705	421356950	3,384341924	<	5,42627449
<b>1999</b>	2463770	15919608	30871	229921	14077668	417162886	11583027	401013357	4,835658832	<	5,358022868
<b>2000</b>	2229580	15602057	28867	204302	12704789	410996478	10446342	395190119	5,559079621	≥	5,406087082
<b>2001</b>	2289080	15684066	27951	194020	12670641	414342232	10353610	398464146	5,765251391	≥	5,616939644
<b>2002</b>	2589930	17451178	26858	205134	14206489	442610290	11589701	424953978	5,000176048	<	5,441679321
<b>2003</b>	2986470	20643644	28172	235122	17317772	525080964	14303130	504202198	4,398651963	<	5,099709576
<b>2004</b>	3550370	24421691	32621	259962	19764843	607443140	16181852	582761487	4,710476134	<	5,235528177
<b>2005</b>	3717970	25311558	36122	338491	20655305	654088142	16901213	628438093	4,129933543	<	5,461747645
<b>2006</b>	4038410	27809931	44680	390581	22428554	721950701	18345464	693750189	4,501745025	<	5,491423162
<b>2007</b>	4741610	31571018	79763	432467	27240055	873286036	22418682	841282551	7,184473471	≥	5,635974882
<b>2008</b>	5277540	37074772	57209	542697	29619992	1059857464	24285243	1022239995	4,600573197	<	5,991884868

Source: FAO

Note: Own calculations with the cross-country BI, expression (2)

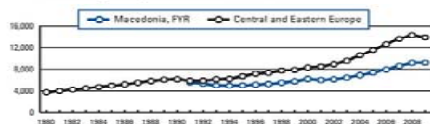
# Appendix D: Global Competitiveness Indexes and Ranks for FYROM

## Macedonia, FYR

### Key indicators, 2009

Population (millions)	2.0
GDP (US\$ billions)	9.2
GDP per capita (US\$)	4,482
GDP (PPP) as share (%) of world total	0.03

GDP (PPP) per capita (int'l \$), 1980-2009



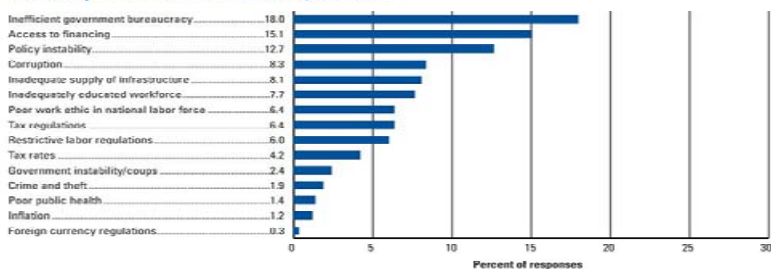
### Global Competitiveness Index

	Rank (out of 138)	Score (1-7)
<b>GCI 2010-2011</b>	<b>79</b>	<b>4.0</b>
GCI 2009-2010 (out of 133)	84	3.9
GCI 2008-2009 (out of 134)	89	3.9
<b>Basic requirements</b>	<b>70</b>	<b>4.4</b>
1st pillar: Institutions	80	3.8
2nd pillar: Infrastructure	91	3.5
3rd pillar: Macroeconomic environment	47	4.9
4th pillar: Health and primary education	69	5.7
<b>Efficiency enhancers</b>	<b>83</b>	<b>3.8</b>
5th pillar: Higher education and training	72	4.0
6th pillar: Goods market efficiency	57	4.2
7th pillar: Labor market efficiency	71	4.4
8th pillar: Financial market development	67	4.0
9th pillar: Technological readiness	64	3.6
10th pillar: Market size	106	2.8
<b>Innovation and sophistication factors</b>	<b>97</b>	<b>3.2</b>
11th pillar: Business sophistication	96	3.5
12th pillar: Innovation	97	2.9

### Stage of development



### The most problematic factors for doing business



Source: GCR 2010-2011

## Macedonia, FYR

### The Global Competitiveness Index in detail

INDICATOR	RANK/129	INDICATOR	RANK/139
<b>1st pillar: Institutions</b>			
1.01 Property rights	105	6.01 Intensity of local competition	96
1.02 Intellectual property protection	87	6.02 Extant of market dominance	35
1.03 Diversion of public funds	59	6.03 Effectiveness of anti-monopoly policy	94
1.04 Public trust of politicians	68	6.04 Extent and effect of taxation	42
1.05 Irregular payments and bribes	56	6.05 Total tax rate*	10
1.06 Judicial independence	103	6.06 Number of procedures required to start a business*	14
1.07 Favoritism in decisions of government officials	71	6.07 Time required to start a business*	6
1.08 Wastefulness of government spending	86	6.08 Agricultural policy costs	33
1.09 Burden of government regulation	90	6.09 Prevalence of trade barriers	76
1.10 Efficiency of legal framework in settling disputes	59	6.10 Trade tariffs*	59
1.11 Efficiency of legal framework in challenging regulations	110	6.11 Prevalence of foreign ownership	124
1.12 Transparency of government policymaking	80	6.12 Business impact of rules on FDI	115
1.13 Business costs of terrorism	66	6.13 Burden of customs procedures	62
1.14 Business costs of crime and violence	66	6.14 Degree of customer orientation	74
1.15 Organized crime	92	6.15 Buyer sophistication	110
1.16 Reliability of police services	69	<b>7th pillar: Labor market efficiency</b>	
1.17 Ethical behavior of firms	77	7.01 Cooperation in labor-employer relations	82
1.18 Strength of auditing and reporting standards	70	7.02 Flexibility of wage determination	6
1.19 Efficacy of corporate boards	106	7.03 Rigidity of employment*	33
1.20 Protection of minority shareholders' interests	112	7.04 Hiring and firing practices	40
1.21 Strength of investor protection*	20	7.05 Redundancy costs*	48
<b>2nd pillar: Infrastructure</b>			
2.01 Quality of overall infrastructure	89	7.06 Pay and productivity	51
2.02 Quality of roads	99	7.07 Reliance on professional management	115
2.03 Quality of railroad infrastructure	81	7.08 Brain drain	126
2.04 Quality of port infrastructure	90	7.09 Female participation in labor force*	101
2.05 Quality of air transport infrastructure	127	<b>8th pillar: Financial market development</b>	
2.06 Available airline seat kilometers*	134	8.01 Availability of financial services	122
2.07 Quality of electricity supply	72	8.02 Affordability of financial services	112
2.08 Fixed telephone lines*	61	8.03 Financing through local equity market	86
2.09 Mobile telephone subscriptions*	69	8.04 Ease of access to loans	122
<b>3rd pillar: Macroeconomic environment</b>			
3.01 Government budget balance*	45	8.05 Venture capital availability	72
3.02 National savings rate*	99	8.06 Restriction on capital flows	103
3.03 Inflation*	9	8.07 Soundness of banks	78
3.04 Interest rate spread*	32	8.08 Regulation of securities exchanges	65
3.05 Government debt*	27	8.09 Legal rights index*	39
3.06 Country credit rating*	82	<b>9th pillar: Technological readiness</b>	
<b>4th pillar: Health and primary education</b>			
4.01 Business impact of malaria	1	9.01 Availability of latest technologies	80
4.02 Malaria incidence*	1	9.02 Firm-level technology absorption	113
4.03 Business impact of tuberculosis	70	9.03 FDI and technology transfer	105
4.04 Tuberculosis incidence*	52	9.04 Internet users*	42
4.05 Business impact of HIV/AIDS	46	9.05 Broadband Internet subscriptions*	47
4.06 HIV prevalence*	1	9.08 Internet bandwidth*	124
4.07 Infant mortality*	54	<b>10th pillar: Market size</b>	
4.08 Life expectancy*	58	10.01 Domestic market size index*	108
4.09 Quality of primary education	68	10.02 Foreign market size index*	98
4.10 Primary education enrollment rate*	110	<b>11th pillar: Business sophistication</b>	
<b>5th pillar: Higher education and training</b>			
5.01 Secondary education enrollment rate*	79	11.01 Local supplier quality	66
5.02 Tertiary education enrollment rate*	58	11.02 Local supplier quality	63
5.03 Quality of the educational system	59	11.03 State of cluster development	107
5.04 Quality of math and science education	61	11.04 Nature of competitive advantage	130
5.05 Quality of management schools	75	11.05 Value chain breadth	80
5.06 Internet access in schools	54	11.06 Control of international distribution	90
5.07 Local availability of research and training services	102	11.07 Production process sophistication	90
5.08 Extent of staff training	119	11.08 Extent of marketing	96
		11.09 Willingness to delegate authority	93
<b>12th pillar: Innovation</b>			
12.01 Capacity for innovation	87	12.01 Capacity for innovation	87
12.02 Quality of scientific research institutions	71	12.02 Quality of scientific research institutions	71
12.03 Company spending on R&D	111	12.03 Company spending on R&D	111
12.04 University-industry collaboration in R&D	74	12.04 University-industry collaboration in R&D	74
12.05 Gov't procurement of advanced tech products	110	12.05 Gov't procurement of advanced tech products	110
12.06 Availability of scientists and engineers	96	12.06 Availability of scientists and engineers	96
12.07 Utility patents per million population*	90	12.07 Utility patents per million population*	90

## Appendix E: Domestic resource cost

“The concept of DRC relates to a measure of real opportunity cost in terms of total domestic resources, of producing (or saving) a net marginal unit of foreign exchange” (Bruno, 1972:16).

The domestic resource cost (DRC) was developed by Bruno in the 1960s (Masters and Winter-Nelson, 1995). The initial use of the DRC was to see what the gains were from the expansion of a profitable project. The evaluations of the profitable projects were measured initially in Israel in the 1960s by Bruno (Warr, 1983). It has since then gone from being used for project evaluation to be used by trade theorists in order to assess comparative advantage. The DRC is also used as an indicator to see if the private sector industries of a country are efficient (Fane, 1995).

Developing countries use the DRC frequently as an indicator for comparative advantage and as a guide for policy reforms (Masters and Winter-Nelson, 1995). It is also used in order to see how competitive a country is in the production of a commodity (Gorton and Davidova, 2001).

$$\text{DRC} = \frac{\text{Value added domestically in terms of opportunity costs}}{\text{Value added in border prices}}$$

The formula above is the basic conceptual one, calculated for any given production process (Appleyard, 1987). The numerator is calculated through an estimation of the value added by the quantities of the primary factors such as land, labor and capital. Each quantity is then multiplied with the opportunity cost or the shadow price. The denominator consists of the international farmgate price minus all expenses from the inputs in the production.

By calculating the DRC it will take on different values which can be interpreted in order to see if the commodity produced has a comparative advantage or disadvantage:

- DRC > 1: Comparative disadvantage exist.
- DRC < 1: Comparative advantage exists.



Sometimes the DRC have to be calculated with both domestic prices and foreign prices (Appleyard, 1987). Then the numerator will be in domestic currency, while the denominator will be in foreign currency. The term will then be multiplied with the OER<sup>12</sup> and the SER<sup>13</sup>.

$$\text{DRC} = \frac{\text{Domestic value added in a commodity}}{\text{Value added in foreign price}} \cdot \frac{\text{OER}}{\text{SER}}$$

By calculating the DRC in this case, it will be calculated in respect to the SER and if the:

- DRC > SER: Comparative disadvantage exist, it is cheaper for the country to import the good in respect to the cost of producing it with domestic resources.
- DRC < SER: Comparative advantage exist, it is more costly to import the good from the world market than producing it at home.

Intuitively speaking, the DRC is an attempt to measure the cost of producing the good with domestic resources through the earning of saving foreign exchange (Appleyard, 1987).

### Implications of the DRC

Masters and Winter-Nelson (1995) discuss the use of the DRC in order to measure the comparative advantage of agricultural activities. In the article they compare the use of the DRC and the SCB<sup>14</sup>. They find that the DRC is biased and that it is sometimes rational to use the SCB instead. The bias in the measurement of the DRC is important for the developing countries because of the difference between the “traditional” farming systems and the “modern” ones, where the first one is the one used mainly by developing countries. The “traditional” ones are land or labor-intensive while the “modern” ones use more tradable input<sup>15</sup>. The DRC exaggerates the social gain by the use of tradable inputs. They conclude that one should use the DRC when the shadow exchange rate cannot be estimated.

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<sup>12</sup> Official exchange rate

<sup>13</sup> Shadow exchange rate

<sup>14</sup> Social cost-benefit ratio

<sup>15</sup> Tradable input consists of herbicides, technical equipment, fertilizers and other inputs substitutable for land (Masters and Winter-Nelson, 1995)

Siggel (2006) discuss two shortages in the DRC in his article. One is that the intermediate inputs<sup>16</sup>, which are not accounted for in the calculations, can be a source of comparative advantage for a country. The other shortage is the one of protection which leads to an efficient use of resources in a country. The price distortions can be omitted, even though; the measurement of the comparative advantage through the DRC may be biased.

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<sup>16</sup> Inputs used by a country that are either imported or produced elsewhere in the economy (www, OECD, 2011)

## Appendix F: Export unit value for FYROM, Croatia, France and Italy to Germany (2002-2009)

Exports of wine from FYROM to Germany			Exports of wine from France to Germany			Exports of wine from Croatia to Germany			
Value	Quantity	Export unit value	Value	Quantity	Export unit value	Value	Quantity	Export unit value	
<b>2002</b>	13 674 107	44 413 527	0,307882	654 907 933	308 158 400	2,125231	2 920 123	1 913 153	1,526341
<b>2003</b>	13 695 055	34 278 211	0,399527	759 658 404	293 444 300	2,588765	3 619 955	1 521 324	2,379477
<b>2004</b>	14 961 392	32 591 439	0,459059	774 253 369	270 658 400	2,860629	3 870 613	1 228 324	3,151134
<b>2005</b>	16 288 370	37 828 106	0,430589	743 321 524	244 053 700	3,045729	3 440 464	1 066 858	3,224857
<b>2006</b>	13 839 048	35 015 360	0,395228	746 505 827	241 967 498	3,085149	3 392 771	949 546	3,573045
<b>2007</b>	16 762 922	38 506 728	0,435324	855 854 238	258 994 949	3,304521	3 372 411	842 118	4,004677
<b>2008</b>	-	-	-	987 374 956	242 094 080	4,078476	3 383 647	732 869	4,616987
<b>2009</b>	20 052 672	39 658 432	0,505635	863 179 305	236 110 477	3,655828	3 522 807	743 680	4,736993

Exports of wine from Bulgaria to Germany			Exports of wine from Italy to Germany			
Value	Quantity	Export unit value	Value	Quantity	Export unit value	
<b>2002</b>	8 488 946	14 690 183	0,577865	713 403 360	576 830 479	1,236764
<b>2003</b>	8 894 937	11 267 917	0,789404	798 490 852	484 929 422	1,646613
<b>2004</b>	8 034 180	8 822 597	0,910637	903 957 623	523 356 983	1,72723
<b>2005</b>	4 543 502	4 963 219	0,915435	884 124 644	569 012 264	1,553788
<b>2006</b>	3 913 633	4 020 003	0,97354	908 059 663	655 802 322	1,384655
<b>2007</b>	3 845 535	3 252 873	1,182196	1 043 126 583	633 271 606	1,647203
<b>2008</b>	3 411 231	2 215 604	1,539639	1 170 515 232	594 639 485	1,968445
<b>2009</b>	2 198 822	1 468 418	1,497409	1 138 196 125	669 459 615	1,700171

Source: UNcomtrade