

# EVOLUTION OF APPLE PRODUCTION IN THE POST-MACROSOCIAL TRANSFORMATION PERIOD

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## ЕВОЛЮЦИЯ НА ПРОИЗВОДСТВОТО НА ЯБЪЛКИ В ПЕРИОДА СЛЕД МАКРОСОЦИАЛНАТА ТРАНСФОРМАЦИЯ

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### Abstract

The apple is the most widespread fruit species of the temperate climate and has great economic importance. It is characterized by high productivity, good transportability and storability of the fruits. The apples can be offered on the market all year round with a good organization of the assortment and ensure a refrigerated base. The apple production ensures much healthy benefits of people like food, vitamins, fiber, etc. Also it could be seen as an activity that achieves good economic results. The greater return on resources invested in this production will facilitate an increase in the standard of living of employed in this activity. Also, many authors examine apple production, both on a global and national scale. Leading producers of apples in the world are China, USA, Poland and Turkey. In the EU – 27 are Poland, Italy and France in 2021. The aim of the study is to examine the evolution of apple production in Bulgaria for the period after the 1990s. We analyzed apple harvested areas, average yield and production through descriptive statistics methods. In addition we did correlation analysis with follow indicators: export and import quantity and value, production, as well as prices and quantity of export. It was founded that the transition to a market economy in Bulgarian agriculture also had a negative impact on foreign trade in fresh fruit. As a result of all these Bulgaria had turned from an exporter into an importer of fruit.

**Key words:** Apple production, Export, Import, Correlation

**JEL:** Q10, Q13, Q17

### Introduction

There are many scientific works reviewing conventional apple production in literature (Vannoppen et al., 2002; Krishkova, 2015; Dimitrova, 2016; Krishkova et al., 2018; Sotirov et al., 2018). Increasing production costs, heavy reliance on non-renewable resources, reduced biodiversity, water contamination, chemical residues in food, soil degradation and health risks to farm workers handling pesticides all bring into question the sustainability of conventional farming systems (Reganold et

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al., 2001). As a result of all these factors, organic farming became one of the fastest growing segments of US and European agriculture during the 1990s (Alföldi et al., 2000; Greene et al., 2003). Nowadays, there is a lot of emphasis on the preservation of biodiversity in this production (Borovinova et al., 2014; Weekers et al., 2022).

Along with organic production there is also conventional apple production for the mass market.

There are studies in the literature that analyze reforms in 1970s and 1980s and their effects on agriculture, as well as policies during post-communist transition and European Union (EU) integration, and their consequences for agricultural development (Bachev, 2008). Land relations in Bulgaria are transformed with the advent of democracy (Yovchevska, 2015; Yovchevska, 2016), as a result land fragmentation period occurs. The agricultural land was broken up and distributed to many owners. Many socio-economic problems, changes in harvested areas and agricultural crops production also arise from this.

The study aims to examine evolution of apple production in Bulgaria for the period after the 1990s. In addition, import, export and price of apple production will be analyzed.

### **Methodological framework**

In the article we study the post-macrosocial transformation period including 3 stages: (1) The advent of democracy in Bulgaria; (2) The period before the accession of Bulgaria to the EU; (3) The period after the accession of Bulgaria to the EU. The study covers 30-year period data.

Object of research is changes in harvested areas, production, average yields, import, export and price of apple production in Bulgaria. The analysis and evaluation of state and development of apple production is done based on use of descriptive statistics methods: collection and processing of official statistical data. Correlation analysis aims to enhance the methods used by examining relationships between two variables to establish correlation degree between causes and effects. Correlation analysis provides a solution to the relationship and strength between two or more phenomena (Tosheva, 2012; Kalinov 2013).

### **Results and discussions**

In the research, we report data for a 30-year period, which is divided into 3 stages.

#### **I. The advent of democracy – 1989-1998:**

An important moment in agriculture from this period turns out to be the changed socio-economic system which leaves a significant imprint on land relations in Bulgaria (Yovchevska, 2015). This leads to the development potential of agriculture, through the so-called "meeting" of private property with the free market in other words returning the land to real limits. As a result, apple production meets with

serious changes which led to a quick reduction in the area of apples, average yields and total fruit production. Areas of 23.9 thousand ha in 1989 decreased to 13.6 thousand ha (43.1% less) in 1997 (Figure 1).

The main reason for the condition is deterioration of age structure and slow rate of creating new apple plantations. For a long period, the majority of plantations have been left without the necessary care which led to massive premature senescence and dying of fruit trees. Losses from the liquidation of plantations with an unexpired depreciation period are particularly large. During the period, the same trend was observed in apple production – from 398.7 thousand tons, it decreased to 77.8 thousand tons which is five-time less (1989-1991). At the end of the period, apple production reached 129.1 thousand tons (Figure2). The growth is primarily due to an increase in yields per hectare, due to entry into fruiting of the young apple plantations and application of modern cultivation technologies.

II. The period before the accession of Bulgaria to the European Union – 1999 – 2006:

During period 2000 – 2006, a Special Accession Programme for Agriculture and Rural Development (SAPARD) was created under Regulation 1268/1999. The aims were to develop efficient agricultural production with a competitive food processing sector, achieve sustainable rural development and increase the income-earning and employment opportunities of people living in rural municipalities. The turning point of reduction in harvested areas and increase in average yields in 2002 is of interest (Figure1). Historically this is normal because the harvest is the result of fruiting apple trees planted on lands returned to people at the end of the 20th century. The period for fruiting stage of the orchard is 10 years.

III. The period after the accession of Bulgaria to the European Union – 2007 – 2020:

Rural Development Programme (RDP) was created based on the SAPARD program. Common Agricultural Programme (CAP) was still working through learning to implement Pillar 1 and Pillar 2 until 2013.

After the lessons learned and efforts to correct the mistakes, a new CAP was created in 2014. As a result, the policy has been improved in some relations and others – not. Despite the participation of thousands of farmers in CAP support, it does not have visible results of a more significant increase in harvested areas. The effect of support in the previous program period measured by average yield of apples is obvious (*Figure 1*).

In addition, we take to review the period after Bulgaria's accession to the EU. Since 2013 apple production growing but looking further back it is found that production decreasing over 30 years. There was a total collapse in the production of apples with 320.9 thousand tons during period 1989-1991 and a more permanent decline with 65.5 thousand tons during period 2000 – 2008. There was an increase in production with fluctuations in individual years after 2008. A reaching of 58.4

thousand tons in 2015 is related to climate change (*Figure 3*). Until 2020 almost constant production of 40 thousand tons per year was maintained.

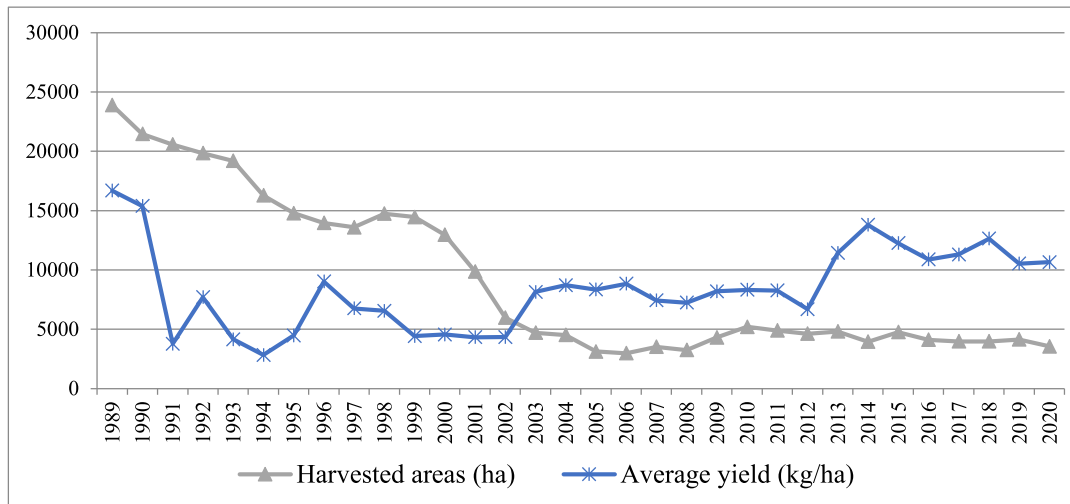


Figure 1. Apple harvested areas and average yield. 1989 – 2020

Source: Agrostat

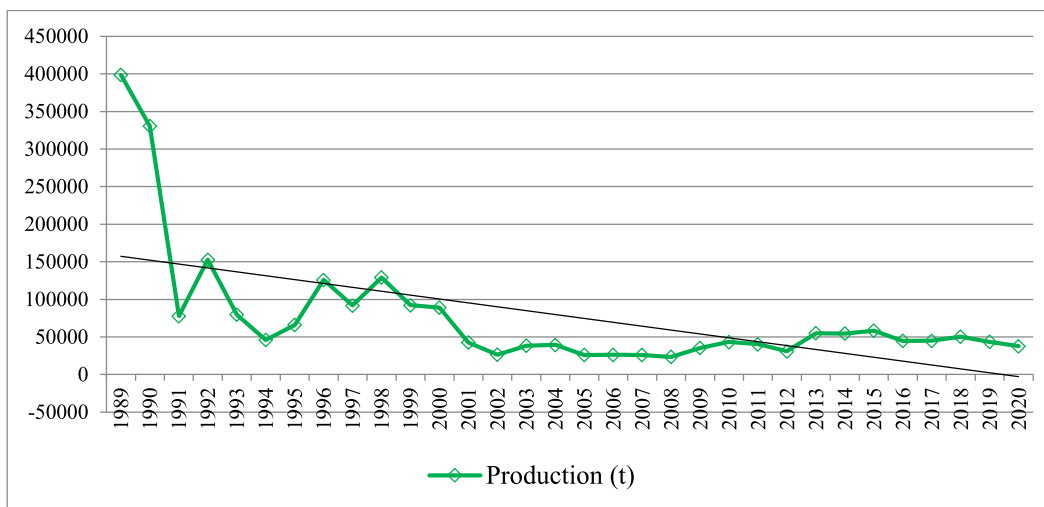


Figure 2. Apple production. 1989 – 2020

Source: Agrostat

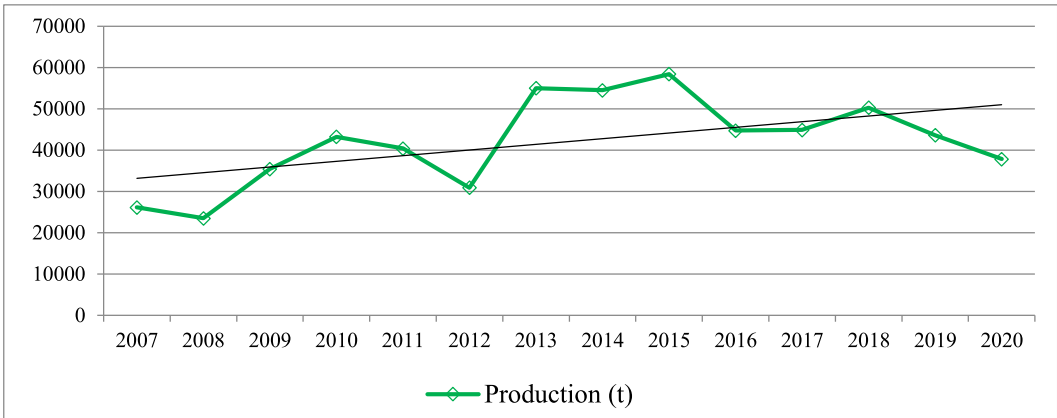


Figure 3. Apple production. 2007 – 2020

Source: Agrostat

The transition to a market economy in Bulgarian agriculture began at the end of the 1980s, has had a negative influence on foreign trade in fresh fruit. The transition to a market economy began at the end of the 1980s in Bulgarian agriculture had had a negative influence on foreign trade in fresh fruit. The quantity of apple exported was 48.7 thousand tons in 1989 also there was a sharp decline to 3.9 thousand tons in 1991 and reaches 1.6 thousand tons in 2020 (Figure 4). Bulgaria was a converter from exporter to importer of fruit. The apple import began with quantities of 2.3 thousand tons in 1992 and reached 68 thousand tons in 2019 (Figure 5). Since 2009, there has been a gradual and almost constant increase in imports until 2018. There is a sharp increase in import by 37% which is explained by lower import prices in 2019.

The unit prices for apple import and export are presented in detail for the period 1989 – 2020 (Figure 6). The average export price reached the highest value at \$1.10 in 2006 and the lowest value at \$0.17 in 2016. The average import price starts at \$0.10 in 1992, increases to \$0.57 in 2011 and comes to \$0.30 in 2020.

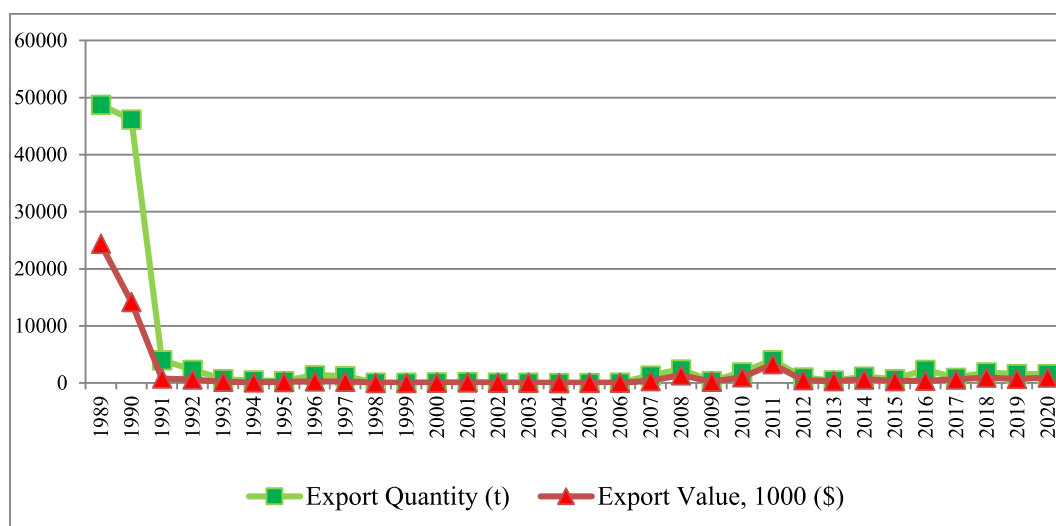


Figure 4. Export of apple, 1989 – 2020

Source: FAOSTAT

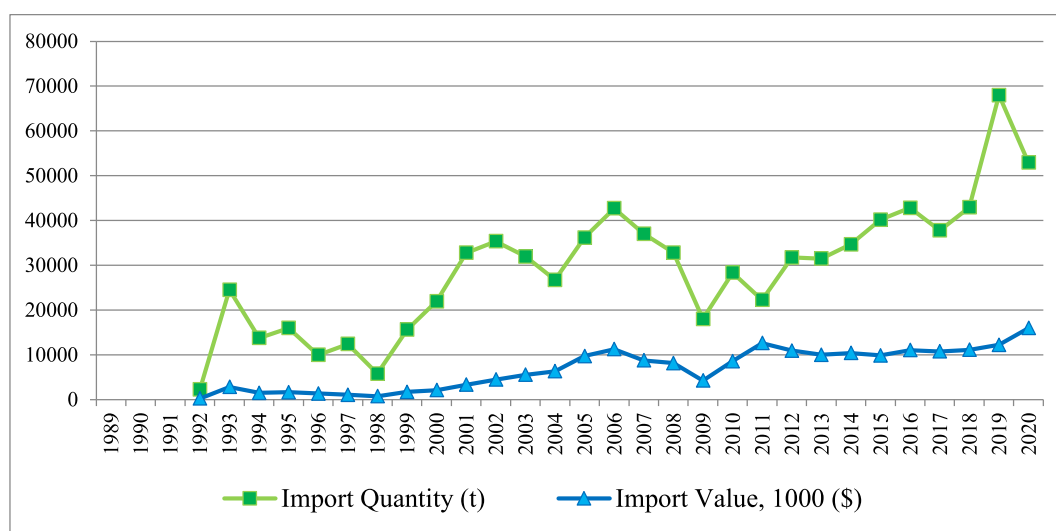


Figure 5. Import of apple, 1989 – 2020

Source: FAOSTAT

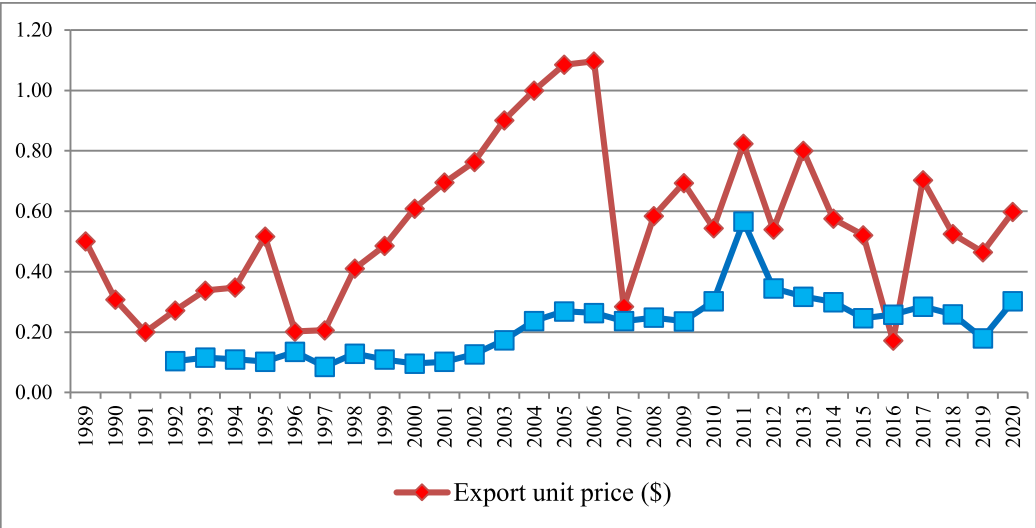


Figure 6. Export and Import unit price, 1989 – 2020

Source: FAOSTAT, Own calculation.

It was found that prices did not influence export and import from 2000 based on the correlation analysis of price, export and import (Table 1). Also, it was found that prices also did not influence export and import from 1998 based on produced output and exported production (Table 1).

Table 1. Correlation

Import (t), price from 2000	Export (t), price from 2000	Import (\$), price from 2000	Export (\$), price from 2000	Production (t), export (t) from 1998	Production (t), export (\$) from 1998
-0,618	-0,038	-0,561	-0,251	-0,535	-0,547

Source: FAOSTAT, Infostat.

Conclusions

During the first stage, apple production underwent serious changes that led to a strong area reduction, average yields and fruit production after the democracy introduction in Bulgaria.

During the second stage, we observe decreased harvested areas and increased average yields, which are result of fruiting apple trees planted during the land reform at the end of the 20th century.

During the third stage, we notice increased apple production with fluctuations in individual years related to climate changes after the accession of Bulgaria to the

EU. Apple production reached a level of 58.4 thousand tons in 2015 and constant production of 40 thousand tons remained per year.

The transition to a market economy in Bulgarian agriculture also had a negative impact on foreign trade in fresh fruit. As a result of all these changes, Bulgaria turned from an exporter into an importer of fruit. It is necessary to pay more attention to the sector, as well as to take adequate measures to overcome the problem.

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