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Faculty of Economics and Management

Department of Economics and Management

Bachelor Thesis

Georgian wine production and perspectives

Nagervadze Nineli

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BACHELOR THESIS ASSIGNMENT

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Economics and Management

Thesis title

Georgia wine production and perspectives

Objectives of thesis

The main objective of the thesis is to assess the development of the Georgian wine industry over the last 20 years. Specifying with characteristics, trends, and challenges.

Methodology

The analysis will be conducted using economic theory and its fundamental understanding. Descriptive techniques and the literary research approach are used to process the first section. The practical portion of the thesis examination of time series data for a few chosen indicators will achieve the thesis's intended objective.

The proposed extent of the thesis

40 – 50 pages

Keywords

Wine characteristics, Georgia, grape, production, vinification, time series

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Recommended information sources

Glonti, T. (2010). Traditional technologies and history of Georgian wine. Bulletin de l'OIV, 83(953), 335.
Insel, B. (2014). The evolving global wine market. Business Economics, 49(1), 46-58.
Kharaishvili, E., Chavleishvili, M., & Natsvaladze, M. (2014). Trends and prospects for the development of Georgian wine market. International Journal of Economics and Management Engineering, 8(10), 3267-3271.
Kosseva, M., Joshi, V. K., & Panesar, P. S. (Eds.). (2016). Science and technology of fruit wine production. Academic Press.
Pinney, T. (2007). A history of wine in America, Volume 1: From the beginnings to prohibition (Vol. 1). Univ of California Press

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The Bachelor Thesis Supervisor

Ing. Pavel Kotyza, Ph.D.

Supervising department

Department of Economics

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prof. Ing. Lukáš Čechura, Ph.D.	**doc. Ing. Tomáš Šubrt, Ph.D.**
Head of department	Dean

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Declaration

I declare that I have worked on my bachelor thesis titled "Georgian wine production and perspectives" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on 15/03/2023

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Nineli Nagervadze

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Georgian wine production and perspectives

Abstract

Grape is an important commodity in Georgia. Its biggest percentage is used for winemaking rather than its own consumption as a fruit. Georgia is one of the twenty countries with high numbers in wine production. The main aim of the thesis is to assess the development of the wine market in Georgia between 1992 and 2022 and to identify the main factors that influenced changes in production, exports, and imports. The method of literary research is used to process the first section of the thesis. The second part of the thesis is solely based on the analysis of time series within the chosen timeframe, mainly from the Geostat database. This section assesses the production of wine and its characteristics by grape type and focuses on the importance of the wine commodity for Georgia's foreign trade. Additionally, self-sufficiency is evaluated for grapes and wine separately. The dissertation outlines that even though there have been inconveniences, Georgia is still keeping its well-deserved position in the wine market segment. One of the most important aspects that will likely have an impact on the future growth of the Georgian wine market is the emphasis on promoting self-sufficiency in the local market.

Keywords: production, Georgia, wine, grape, characteristics, export, analysis.

Gruzínská produkce vína a perspektivy

Abstrakt

Hrozny jsou v Gruzii důležitou komoditou. Největší procento se jich používá spíše k výrobě vína než k vlastní spotřebě jako ovoce. Gruzie je jednou ze dvaceti zemí s vysokým počtem produkce vína. Hlavním cílem práce je zhodnotit vývoj trhu s vínem v Gruzii v letech 1992 až 2022 a identifikovat hlavní faktory, které ovlivnily změny ve výrobě, vývozu a dovozu.
Pro zpracování první části práce je použita metoda literárního výzkumu. Druhá část práce je založena výhradně na analýze časových řad ve zvoleném časovém rámci, zejména z databáze Geostatů. Tato sekce hodnotí výrobu vína a jeho vlastností podle druhu hroznů a zaměřuje se na význam vinařské komodity pro zahraniční obchod Gruzie. Soběstačnost se navíc hodnotí u hroznů a vína zvlášť.
Disertační práce nastiňuje, že i když došlo ke komplikacím, Gruzie si stále udržuje své zasloužené postavení v segmentu trhu s vínem. Jedním z nejdůležitějších aspektů, které budou mít pravděpodobně dopad na budoucí růst gruzínského trhu s vínem, je důraz na podporu soběstačnosti na místním trhu.

Klíčová slova: výroba, Gruzie, víno, hroznové víno, charakteristika, export, analýza

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1 Introduction

Wine is sophisticated and elegant and has a wide range of intriguing qualities. Many countries claim to be the origin of wine. Only Georgia, however, is known as the "cradle of wine."

Georgia is a very small country in the Caucasus region, and it is located at the intersection of Europe and Asia. It is believed to be a transcontinental country, although nowadays it is perceived as part of Europe. Winemaking has always been an integral part of Georgian culture, people, and everyday life. Despite the fact that, Georgian wine has been around for centuries, it still lacks popularity due to geopolitical reasons. The economy of Georgia highly depends on tourism, and wine is one of the most crucial aspects of it. Georgia has a lot of potential for wine tourism owing to its cuisine, friendliness, and distinctive nature.

The wine industry was thoroughly examined in this bachelor's thesis. Not only was the current state of the wine industry's global and local economies outlined, but also its history was analysed along with its future perspectives. It goes without saying that wine production is a huge financial support for the mentioned country, and export plays a significant role. There have been several ups and downs in certain years in the Georgian wine industry, which were thoroughly understood and explained in the following thesis. What’s more, it shows where Georgia stands in the global industry from the viewpoint of the biggest wine producer/consumers.

2 Objectives and Methodology

In the following paragraphs, there are objectives and methodologies that are used in this thesis.

2.1 Objectives

The main objective of the thesis is to assess the development of the grape and wine market in Georgia in the period 1992-2021 and to determine the factors that have been influencing the production, consumption, and export on Georgian market. The sub-aims for the following thesis are:

- What is the position of Georgian wine on the global market?
- How important is wine export for Georgia's economy?
- What are the prospects for the development of Georgian wine on the global market?
- How self-sufficient is Georgia in terms of grapes and wine?

2.2 Methodology

The thesis is divided into three parts. Descriptive techniques and the literary research approach are used to process the first section. The purpose of this section is to define the various types of wine and their different characteristics and trends, as well as to provide an overview of the history of wine production and export.

The second section of the work begins with an overview of the wine market in Georgia and around the world. Also, the major objective of the thesis will be fulfilled by the method of study of the growth of the Georgian wine market from 1992 to 2021. 2022 is not included because of the complicated political environment and lack of valid statistical information.

It is possible to define the elements that form the current market situation and those that are likely to shape it in the future by determining the answers to the aims of the thesis.
The practical portion of the thesis will analyze time series data and apply a simple regression model to a few chosen indicators to achieve the thesis's objective.

The level of self-sufficiency is calculated as a share of wine production (separately) in consumption in Georgia in the selected year:

Equation 1. Self-sufficiency rate for grapes

$$Self - sufficiency\, rate = \frac{\text{Grape production}}{\text{Grape consumption}} \times 100\% \quad (1)$$

Equation 2. Self-sufficiency rate for wine

$$Self - sufficiency\, rate = \frac{Wine\ production}{Wine\ consumption} \times 100\% \quad (2)$$

Observed period is 1992-2021. We do not analyze period after the end of 2021 due to the unavailability of certain data in the country. The period after 2021 in predicted with the help of EXCEL 16.48 forecasting.

The main data sources are Geostat (Georgian Statistical Office), FAO (Food and Agriculture Organization of the United Nations) and Georgian National Wine Agency. To be more specific the data for calculating the self-sufficiency rate was collected from FAO/data/food balances. As for the grape production FAO/data/production/crops and livestock products. Additionally, data for the grape harvest was gathered from the national wine agency. Consumption data was gathered from the world health organization by per capita, as well as from Geostat reports. Grape prices were selected from FAO/data/producer prices and import prices along with the local market prices were collected from Geostat. Data about export, volume and income from export is from National Statistics Office and Forbes.
Prices are shown in SLC/tonne and USD/tonne.

As for the third part of the thesis, it includes the summary of conducted analysis and a discussion of the results.

3 Literature Review

3.1 Understanding what wine is

Wine is an alcohol which produced by grape juice fermentation. (Mills et al., 2008) Technically, any fruit is eligible for making wine. However, they do not produce as much sugar as it is required for the yeast to transform into alcohol. Interestingly, wine is not a simple commodity, but for many years its role has been evolving as part of people's lives, cultures, and conviviality. Ernest Hemingway once said, "Wine is the most civilised thing in the world." Thus, evokes associations with gastronomy, locality, tradition, and quality. (Michalopoulos, 2019)

Because wine is such an important part of global culture and history, it's not surprising that there have been a plethora of books, academic articles, and theses written about the many stories surrounding its origins and legacy. There have been quite peculiar wine tales in the ancient world. (Lawrence, 2020) For instance, Dionysus is the greatest figure of wine in Greek mythology, and it is believed that he discovered viticulture and brought it to Asia. In accordance with Nonnus's aetiology, Dionysus had a lovely lover named Ampelos, who sadly perished by being trampled by a bull after making fun of Selena, the goddess of the moon. After he passed away, a vine grew out of his body, which Dionysus cared for until it yielded grapes, which he subsequently transformed into wine. (Dunn, 2016) What’s more, based on the Epic of Gilgamesh, the first person to discover wine was a woman. According to myth, the woman had horrible headaches and belonged to the harem at the court of King Jamshid. One day, the king discovered that a cup of his favourite grapes had mysteriously gone bad. He believed they were no longer safe to consume and perhaps even poisoned, so he ordered that they be set aside. While this was going on, this lady made the decision to eat the suspect mix in the hopes that it would hasten her death and relieve her pain from her headaches. Instead, she discovered that the beverage was enjoyable and significantly enhanced her mood. (Dunn, 2016)

Furthermore, moderately consuming wine can quite effectively contribute to a healthy life. The combination of alcohol and certain antioxidants found in red wine may help fight off cardiovascular diseases and those diseases that cause heart problems. (DENESH RAJ, 2021) Red wine can significantly lower your risk of developing various cancers such as basal cell, colon, prostate, ovarian, etc. when consumed regularly and in moderation. Antioxidants are found in red wines. (Jerlyn Jones & Smith, 2022)

3.2 Introduction of winemaking techniques in Georgia

Georgia is believed to be the birthplace of wine.(Pullman, 2018) Archaeologists have found the world's first wine, made by the people of the South Caucasus. By burrowing grape juice underground for the winter, these early Georgians realised they could transform it into wine. Viticulture and winemaking are a branch of the existence of the Georgian nation - it is a source of courage and health, a guardian of economic strength and hospitality.(Oqropiridze, 2017)
The majority of grape varieties, which are spread in different countries of the world, have a genetic connection with the Georgian grape. These two words Georgia and 'Vazi' (Vine) have become historical synonyms when describing the Georgian nation.(Barisashvili Giorgi, 2022)
That the identity of the unity of the Georgian nation and Georgian wine is not accidental can be clearly seen from the surviving ruins of ancient Georgian monasteries, churches, and other cult services, whose walls and bas-reliefs are carved with vine ornaments. In the 1980s of the last century, the vineyard areas in Georgia were more than 150 thousand hectares, and 600-700 thousand tons of grapes were harvested, from which dry, naturally sweet, and semi-sweet, dessert, sparkling, Kakhuri, Imeruli, Megruli, and Abkhazian type wines were produced. Of course, as time passed, so did the technologies for caring for and growing Georgian vines, as well as making wine from them.(Glonti, 2010)
In terms of winemaking and viticulture, Georgia can be split into eastern and western regions. The eastern region includes Kakheti and Kartli; the western region includes Imereti, Samegrelo, Guria, Abkhazia, and Racha-Lechkhumi. (Jefford, 2023)
Because of the high levels of tannin and painting compounds in the wines of eastern Georgia, they stand out for their intensity, extract content, and colours. A harmonious combination of components gives the wines of western Georgia their delicate, light, cheery, and gentle qualities. The wines produced in Georgia's various regions differ significantly due to a variety of factors, including the grape varietals used and the unique characteristics of the winemaking processes. Historically, natural yeasts were used to create premium Georgian wines. Georgian wines, which can also be produced with or without chacha, are maturing well and acquiring a rich, distinctive aroma and a delectable taste. (McIntyre, 2015)

There are three categories of traditional Georgian winemaking: Kakhetian wines (with chacha), Imeretian (partial use of chacha), and semi-sweet wines by nature. (Glonti, 2010) Among the other Georgian regions, Kakheti stands out for producing a variety of wines of the highest quality, particularly the Kakhetian variety, which is traditionally made in kvevris by the fermentation of juiced grapes with an entire chacha over the course of five months. Only in Kakheti, in specific microzones using grapes from the Rkatsiteli, Saperavi, Kakhuri Mtsvane, Khikhvi, Kisi, and Kakhuri Mtsvivani varieties, is the finest quality Kakhetian wine produced. The hard parts of the grape, such as the skin, skeleton, and pip, contain a variety of volatile, aroma-forming, and phenolic compounds that are added to Kakhetian wine during the fermentation and formation processes, ensuring the beverage's high antioxidant activity as well as its therapeutic, dietary, and nutritional value. (Jefford Andrew, 2018)

One of Georgia's major wine-producing regions, Imereti, produces a variety of high-quality wines. Wine of the Imeretian variety undergoes minor chacha processing (up to 10%, skeleton-free). Imeretian wines are gaining a powerful, delightful aroma as they are being created. Tsolikouri, Tsitska, and Krakhuna varietals are used to make premium Imeretian wines. Georgian natural sweet wines have a long history and play a significant role in the country's wine selection. Wine made from grapes with a high sugar content and harvested in the late fall is naturally semi-sweet. Traditionally, sweet grape juice was fermented with chacha in kvevris. When the chacha was sunk to the bottom of the kvevri with a residual sugar level of 4-5%, the wine was separated from it. The majority of the liquid and any remaining squeezing were placed in a kvevri, a clay, hermetically sealed vessel. Several locations in both eastern and western Georgia produced naturally semi-sweet wines (Kakheti, Racha Lechkhumi, and Guria). (Castellucci, 2010)

3.2.1. Wine making rules

Since a long time ago, in Georgia, wine has been put in kvevri, which was later partially replaced by the technology of production in the European manner. However, in recent years, making wine in the old Georgian (kvevruli) manner has become popular again in the world.(Agro News, 2021) When the wine is made European style, i.e., without chacha, the cool parts of the grape bunch do not take part in the fermentation process: claret, pips, and chacha. In order to obtain high-quality wine by this method, the harvested grapes should not be delayed and processed on the same day. For this purpose, it is carefully thrown into a press. The process of crushing the bunches should be managed and regulated in such a way that the claret is crushed as little as possible or not at all. Chickpeas and chacha initially enrich the sweet (juice) with the necessary aromatic substances, and later they prevent and hinder the purification of the juice. Both the self-flow and the first juice (obtained by a little pressure) contain a small amount of the curd substance. The sugar obtained from these two streams is used to make high-quality wines. Due to the lack of claret exchange equipment in the family, the cluster should be separated from the claret so that the tannins do not transfer to the wine and the wine does not acquire bitterness. During stronger crushing (squeezing), the juice obtained is collected separately and ordinary consumer wines are made from it. Also, chacha should not stay in the press for a long time because, after fermentation, it gives the wine an unpleasant smell of chacha. (Barisashvili Giorgi, 2022)

In order to make high-quality wine, the juice obtained in this way must be passed through a fine mesh sieve into an accessible vessel, where the inner walls of the vessel must be covered with sulphur and the juice must be left in it for 24 hours by running cold water on the outer walls of the vessel. After that, the sugar is removed from the liquid, heated to a natural temperature, and transferred to the boiling vessel, which is not filled to the end. (Kharbedia, 2013)The volume of the vessel is reduced to 20–25%, and the valve is closed but not completely tight, so that the carbon dioxide produced during the fermentation process can freely leave the vessel and oxygen cannot freely enter it. When the fermentation is over, the boiling liquid is removed from the fermentation tank. The first drawing of the wine takes place after the wine is exposed to its first cold. This usually happens in November or December. Somewhere at the end of February or the beginning of March, when the fermentation process is finished and the wine is well cleaned, the second wine is drawn. (Barisashvili Giorgi, 2022)

By this time, the turbidity-causing substances have already settled, and the wine is free of excess carbonic acid. After the second shooting, we seal the vessel (barrel, bottle) hermetically and open it only when consuming. The lower the temperature at which the sugar ferments, the higher the quality of the wine. It is desirable that this temperature does not drop below 15 degrees or rise above 20 degrees.(Kharbedia, 2013)

Wine from Kvevri

The distinguishing feature of the wine made in this way is the fermentation of the sweet grape with durdo and claret and its further delay on the durdo, which gives it attractiveness, a specific aroma of fruits, a harmonious taste, and an attractive tea color. When making wine using this method, the juice from the press is poured into a pitcher or remains in the press, where the fermentation process takes place. During the fermentation process, the mass is stirred 3-4 times a day. At the end of the fermentation, the pitchers are filled, and the wine material is hermetically stored on the durdo for 3-4 months. (Lortkiphanidze Davit, 2017)

After the expiration of this period, the wine that has been cleaned as a result of self-cleaning is removed from the vat. The duration of planting for the production of brandy wine is one year. Under the conditions of making wine by this method, the tanning enzymatic oxidation, which is carried out by the peroxidase absorbed on the lees, is of decisive importance in the formation of organoleptic properties. With the new technology of this method chacha and claret, pre-crushed into a thin layer, undergo fermentation in the air at a temperature of 18-22 degrees for 4-5 hours, and then fermentation takes place on it. The wine made from pre-fermented chacha in this way is relatively soft, aromatic, colored, and matured.(Barisashvili Giorgi, 2022)

White wine technique

In Georgia, wine is made using this method mainly in Imereti. At this time, the harvested grapes are crushed, and the desalinated wort is transferred to a sieve, from which the resulting sweet is transferred to the vats, where the fermentation process produces a pure culture of yeast. For this purpose, 0.5–0.6 kg of chacha are added to the sweet by dose. As a result, Imerul white wine falls somewhere between European and Kakhuri (Kvevri) wine. Excess chacha makes such a wine rough. When making wine in this way, 10-15% of the fermentation area is left in the pitcher, and a 50-cm-long pipe is made for it, after which the pitcher is closed with a solid (chestnut or oak) valve. For the purpose of disinfection, the lower side of the valve is usually burned with fire. Kneaded clay is placed on top of and around the valve at a thickness of 15-20 cm, and silt is placed on it at a length of 10-15 cm in order to protect the leakage. Before that, during intense fermentation, it is necessary to stir the chacha 3–4 times a day.(Lortkiphanidze Davit, 2017)

3.3 Basic characteristics of Georgian wine

The features of Georgian wine are distinctive, with the exception of full-bodied white and red wines. Georgian wine has stronger tannin and alcohol levels than other wine types, which allows it to age better and retain its free spirit for years. (Currin & Robinson, 2022) *Rkatsiteli* is the most often planted white grape type in Georgia, but *Saperavi* grapes are primarily used to make red wine. The Georgian wine business proudly offers rare native grapes such as Chitistvala, Mtsvivani, Tetra, etc. in addition to the most widely grown types. (Avariashvili Tamuka, 2021)

In Georgia, there are around 50,000 hectares of grapes, of which 75% are red and 25% are white. The Kakheti region of eastern Georgia, which serves as the nation's main wine-producing region, is home to the vast majority of the country's vineyards. There are about 80 different grape types in Kakheti, but the two most popular are Rkatsiteli (white) and Saperavi (red). (Barbakadze, 2018)

The *Rkatsiteli* white grape variety is thought to have first appeared in eastern Georgia in the first century, though it is now produced both domestically and overseas. White wines made by Rkatsiteli have a broad taste profile, a good body, and a noticeable acidity. (Oqropiridze, 2017) Rkatsiteli wines are more sophisticated when made with the traditional Georgian qvevri process. They are restrained and energizing, with crisp green-apple notes and hints of quince and white peach. High-quality table wines, regional wines, and wines under appellation control are produced from Rkatsiteli grapes. Grapes from the Rkatsiteli variety are regularly blended with Mtsvane Kakhuri grapes.(Ramishvili & ketskhoveli, 2023)

Saperavi grape offers a distinctive alternative to typical red wines that is both rich in fruit flavor and snappy with acidity. Georgian native Saperavi is the most popular red variety there.

Meaning "the place of color," its name. It is one of the rare teinturier grape varietals, which have both red skin and red flesh. Saperavi wine has a dark, inky, and even completely opaque appearance. It tastes and smells like dark berries, grilled pork, and spices.(Ramishvili, 2022)

Early in the 19th century, *Kakhuri Mtsvane* was one of the most popular white grape types in the Kakheti region. But illnesses like powdery mildew and phylloxera caused it to become progressively less common. Kakhuri Mtsvane is a light-bodied grape variety that ripens earlier than other grape kinds and has distinct fragrances.(McIntyre, 2015) It produces wonderful, classic Kvevri wines. Some researchers think the Rkatsiteli and Mtsvane grape varietals were crossed to create the Kisi white grape. Kisi vines only yield a modest quantity of grapes, which ripen in the middle of the season. Traditional Georgian and classical European wines created from Kisi grapes have distinct flavors and scents, but Kvevri wines are distinguished by the aromas of ripe pear, and nut.(Tabidze, 2022)

This type is mostly grown in western Georgia's Guria and Adjara areas for rosé wines. Chkhaveri vines were grown to climb trees during the early days of Georgian viticulture—a practice known as 'maghlari'. Chkhaveri grapes are often collected in the second quarter of November since they ripen slowly and yield little. Wines made from Chkhaveri grapes have moderate to high alcohol content and are delicate, harmonious, and have scents of white fruits. (Ramishvili & ketskhoveli, 2023)

Mujuretuli red grape from the Racha region matures later than usual and has a remarkable capacity to store sugar. Its grapes can produce traditional dry red wines as well as naturally semisweet wines, a style known as khvanchkara, which is frequently mixed with Aleksandrouli.(Avariashvili Tamuka, 2021)

3.4 Government and Wine industry

The Law of Georgia on Vines and Wine's goals are to promote the growth of viticulture and winemaking as a priority sector of the nation's economy, as well as the production and marketing of competitive grapes, wines, and other alcoholic beverages with grape origins. It also seeks to safeguard the consumer market from fake and subpar goods.

The following amendment was made to the Law of Georgia "On Grapes and Wine" (Department of the Parliament, No. 23-24, 30.06.1998, p. 37):

1. The preamble of the law shall be formulated as follows:

"The purpose of this law is to promote the development of viticulture and winemaking in Georgia, as a historically, culturally and economically priority branch of the country, the distribution and popularization of centuries-old local Georgian grape varieties, Georgian traditional methods of winemaking, high-quality grapes, wine, and other alcoholic beverages of grape origin. production and sale, development of a competitive market of wine and other alcoholic beverages in Georgia and protection of consumer interests, maintenance and growth of the international reputation of the Georgian viticulture and winemaking industry." (*Wine Law*, 2017)

Some time ago, it became known that the government would subsidize the harvest this year as well. According to Prime Minister Irakli Gharibashvili, the government made a decision to subsidize the vintage in light of the existing challenges. As he stated at the government meeting, the subsidy for the 2022 vintage will cost 150 million GEL. (Sukhiashvili, 2022)

Subsidizing the price of grapes in Georgia started in 2008, when Russia imposed an economic embargo on Georgian wine. Since the main export market for Georgian wine at the time was the Russian Federation, the embargo brought great social and economic damage to Georgian winemaking at that time. In order to eliminate the negative consequences caused by this damage and to keep the activity profitable for the growers, it became necessary to subsidize the price of grapes. Between 2008 and 2012, the grape subsidy program was small-scale. In particular, subsidizing 1 kg of grapes of the Rkatsitli variety cost the Georgian budget 0.15 GEL, the Saperavi variety 0.25 GEL, and 1 kg of Mujuretuli/Alexandrouli 1 GEL. In the aforementioned years, an average of 6-7 million GEL was spent from the harvest budget.(Salome Deisadze & Gelashvili, 2020)

The situation has changed since 2013, when, after the change of government, 1 GEL was allocated for the Mujuretuli/Alexandrouli subsidy, although the subsidy for Rkatsiteli and

Saferavi varieties increased to 0.4 and 0.35 GEL, respectively. Therefore, the amount of money allocated from the budget increased significantly and reached 32 million GEL in 2013. The subsidy structure shifted dramatically in 2017, with the government ceasing to subsidize grape prices while still allocating funds to state-owned enterprises to purchase surplus grapes left on the market. Accordingly, according to the government's decision in 2017, no subsidy was given for quality grapes. The subsidy was maintained only for Alexandrouli and Mujuretuli (1 kg of grapes, 2 GEL). (Salome Deisadze & Gelashvili, 2020)

As mentioned above, the compensation was received by those wine companies that bought one kilogram of grapes (Rkatsiteli and Kakhuri green) for at least 70 bottles of brandy and concentrated grape sweet. The compensation amount is 1 kg. In 2018-2019, the government did not subsidize the price of grapes, although the state enterprise "Acura" allocated 10–10 million GEL in both years to purchase surplus grapes on the market, which, one might say, was an indirect subsidy of the vintage. 10 million allocated in 2019 was not enough, and the amount accumulated for the purchase of surplus grapes amounted to 80 million GEL.(Salome Deisadze & Gelashvili, 2020)

In 2020, due to the COVID pandemic, the government of Georgia decided to subsidize the price of grapes again. For this purpose, 40 million GEL were allocated from the state budget. In addition to the above, additional funds were allocated for the purchase of surplus grapes on the market, and in the end, the subsidy for the harvest amounted to 87.1 million GEL. This year, the government bought 95,000 tons of grapes. A total of 138 million GEL was allocated for subsidizing the harvest in 2021. The main amount of the subsidy was transferred to the state-owned LLC "Crop Management" company (107 million GEL). This year, as it was mentioned above, according to the government's decision, 150 million GEL was allocated for subsidizing the harvest. The price of white grapes will be subsidized, as well as the purchase of surplus grapes left on the market. (Sukhiashvili, 2022)

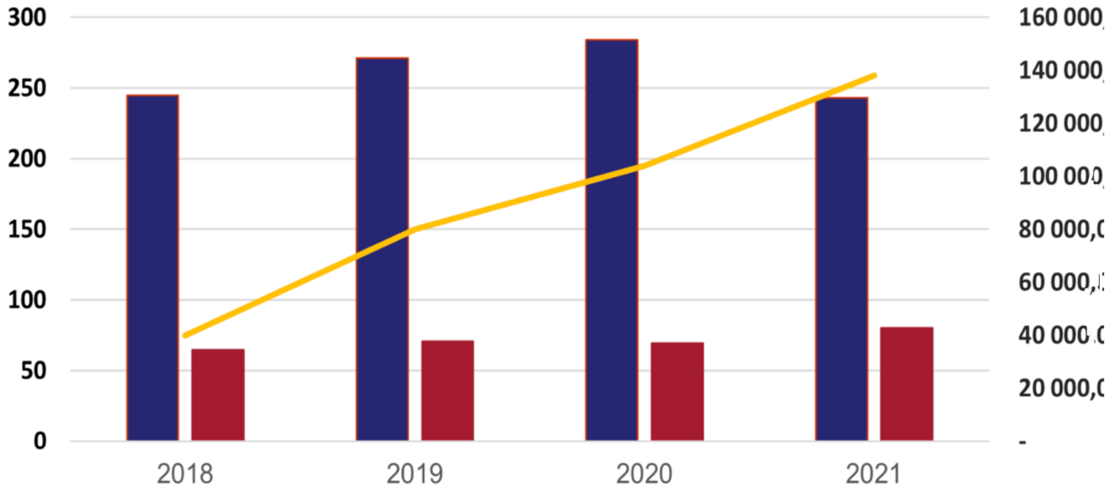
Table 1. Amount and total cost allocated for subsidizing individual grape varieties in 2008-2022 (in GEL)

Year	Rkatsiteli	Saperavi	Mujuretuli	Total Lari MLN
2008	0,15	0,25	-	6,1
2009	0,15	0,25	1	5,5
2010	0,15	0,25	1	4,7
2011	0,15	0,25	1	8,7
2012	0,25	0,35	1	14,8
2013	0,4	0,35	1	32
2014	0,35	0,15	1	32
2015	0,35	0,15	2	30
2016	0,45	0,2	2	19
2017	-	-	2	13
2018	-	-	6	10
2019	-	-	-	80
2020	-	-	-	87
2021	0,35	-	-	138
2022	0,35	-	-	150

Source: National wine agency

According to the statistics, the amount of subsidies has been increasing since 2013, with a downward trend from 2016 to 2018. The government also decided to discontinue subsidies in 2018, though it still purchased surplus grapes on the market. The amount of harvest subsidies has increased, particularly in recent years, due to the fact that, in addition to subsidizing grape prices, the government also purchases surplus grapes on the market. Due to the increased harvest of grapes, the market has to buy more and more surplus grapes every year.

Figure 1. Processed grapes, wine exports and government subsidy expenditure



Source: Forbes, Georgia

*the purple column -Total processed grapes (thousand tons)

*the red column- Export of wine

*The yellow line-Expenditure incurred by government

The suggested model of vintage subsidy has been processing in the country for several years. As it is clear from the statistics of different years, the amount given as a subsidy is increasing: 2017 - 40 million GEL subsidy, 2018 - 40 million GEL subsidy, 2019 - 80 million GEL subsidy, 2020 - 104 million GEL subsidy, and 138 million GEL in 2021. (Jmukhadze, 2022)

3.5 Overview of global wine industry

The grape and wine industry is a long-standing and widespread one in the modern world. One of the oldest commodities in the world was exchanged in Europe, where the wine business first emerged. The wine market in Europe has experienced significant economic and regulatory upheaval over the last 20 years. The rivalry has greatly grown due to the emergence of new wine-producing nations, highlighting the market's global nature.(S.M.C. Loureiro, 2017)

Although the wine industry may conjure up images of a leisurely lifestyle setting, it is a huge business sector. In certain societies, drinking wine has always been ingrained, while in others it is utterly disregarded or even forbidden. The most developed wine markets are in Europe, where consumption per capita is over 35 litres annually in Portugal, Italy, and France. Europe continues to be the global consumption hub, accounting for 58% of volume and 50% of overall value. (Landgeist, 2022)

Despite having a very fragmented market, Europe still controls the majority of the world's wine production. The production and consumption of wine are centred in Europe, where three nations—France, Italy, and Spain—account for 75% of global production and consumption. These "Old World" winemakers in Europe are frequently distinguished from "New World" wineries in nations like Australia, Chile, South Africa, and the US by industry experts. Due to their greater populations, the USA, China, and France have the largest combined wine markets, although Germany, the USA, and the United Kingdom are the top importers of wine despite having far lower production than consumption.(Jenster & Jenster, 1993)

In the past two decades, the "New World" has gained market share while Europe's wine production has sharply decreased.(Fleming, 2014) Several aspects of winemaking, including cultivation, watering, classification, and branding, are governed by tight rules throughout Europe. The most restrictive limitations are imposed by the French government. It frequently takes legal action to defend the centuries-old name. For instance, wineries are only permitted to call sparkling wine "Champagne" if it is made from three grape varieties indigenous to the same region. Production is restricted by fewer constraints in countries like the US, Chile, and South Africa. (Banks & Overton, 2009) The sector in Australia has particularly lax regulations. Based on the use of grapes from a variety of geographical areas, wine producers can label their products. 8 In addition, rather than using the date of grape harvest, they can identify the wine by the year it was bottled. They can thus mix grapes from various wineries to produce a specific wine. The vineyards in Europe likewise don't do a lot of consumer branding. The wines are instead more commonly recognized by their appellation, such as Bordeaux, Burgundy, Chianti, etc. The New World wine producers frequently categorise their wines based on the type of grapes they use. (Banks & Overton, 2009)

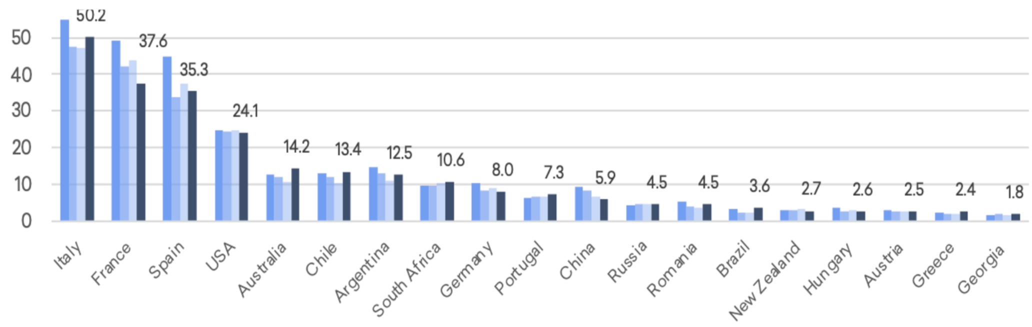
Inexperienced consumers find it much simpler to connect a wine's flavour to a certain grape variety than to a specific geographic area. The wine industries in the "New World" and the "Old World" are very different. The old world seems to have more purchasing power.

Consumers in the Old World are better educated and more price-sensitive than those in the New World. (Storchmann, 2012) Europe has greater sales through groceries and other off-site sites, which also suggests that the region has a stronger consumer market. Moreover, stores in Europe sell private-label wines. More product differentiation is a result of branding in the New World, which also lowers buyer power. In the past, there haven't been many obstacles to entry in the wine sector. Nonetheless, the New World's significant investments in technological advancements and automation, have begun to raise entry barriers in those areas. (Banks & Overton, 2009) In New World regions like Napa Valley, independent, high-end wineries must now make significant physical and working capital investments. US companies like Gallo and Mondavi have made large capital investments in brand-new, cutting-edge wineries. (Storchmann, 2012)

The Old World continues to shun technology, mechanisation, and advertising. As a result, some regions of the world seem to have reduced entry barriers. There is no doubt that wine may be replaced with other drinks. The in-house wine production, though, might be where geographic regions differ most noticeably from one another. In the old world, many households still make their own wine, which is a great alternative to buying wine from the store. People don't typically make their own wine in the New World. As a result, it seems like substitution was more of a commercial problem before. (Mercer, 2022)

As for the wine production in Italy, Australia, Chile, and other countries climbed in 2021 while declining in a few of the EU's main exporting nations. The total volume of wine produced worldwide in 2021 was 260 MLN hectoliters, a slight reduction over the previous year. Together, Italy, France, and Spain produced 123 MLN hectoliters of wine in 2021, or 47% of the total amount produced worldwide. Only Italy, one of the top 3 wine-producing nations, experienced significant growth; Spain and France saw declines as a result of the adverse weather. (S.M.C. Loureiro, 2017)

Figure 2. Main Wine Producing Countries, 2018 - 2021 (MLN, HL)



Source: GeoStat, TBC Capital

92% of the wine produced worldwide in 2021 was produced by 20 nations. Georgia came in at number 19 among the world's major wine-producing countries between 2018 and 2021. Georgia produced 1.8 million hectoliters of wine representing a 16% increase over the previous year. (Roberto, 2003)

3.6 Overview of Georgian wine industry

With 76% of the export market, Georgian wine producers saw their revenue soar in 2021. The number of currently operating, officially registered firms in the wine sector is on the rise, and it has reached its highest point in 2021. Profitability measures indicate a gradual decline in profitability since the lowest performance was achieved in 2020 as a result of pandemic-related issues, such as rising administrative costs, increased borrowing with greater financial charges, and more exposure to currency risk. The net profit is where the decline in profitability is most noticeable. The margin changed from positive to negative as numerous wine producers revealed period losses. Due to the significant percentage of exports in Georgia's wine turnover, the country's wine industry is extremely susceptible to regional and international political and economic variables. The conflict in Ukraine and the energy crisis are predicted to cause turbulence for the remainder of 2022. (Surmava et al., 2022) Due to rising wine consumption worldwide, the export of the wine business has expanded significantly. Due to the poor conditions in several major wine-producing regions, global wine production has somewhat declined. In the top wine-importing nations, Georgian wine exports are insignificant, but Georgian wine imports in Russia represented 19% of their total value in USD. The biggest volume of wine exported from Georgia, totaling $ 234 MLN, was in 2021. Russia continued to be the main market for Georgian wine. The lowest percentage since the export to Russia resumed, it represented 56% of the total wine exported from Georgia. Georgian wine is marketed to consumers in Poland, the United States, the United Kingdom, Japan, Germany, China, and the Baltic nations. (Surmava et al., 2022)

In 2021, Russia and Ukraine continued to be the top export destinations. For the first several months, the war in Ukraine had a severe impact on the Georgian wine industry. According to a careful analysis of the first half of 2022, the second quarter of the year saw almost no wine exports to Ukraine. However, because producers were able to divert their product to other markets, the overall decline in Georgian wine exports was insignificant compared to the same period last year. Red wine exports from Georgia have consistently surpassed white wine exports over time. The year 2021 was no exception, with red wine accounting for the majority of exports. Although customer preferences in the key strategic areas vary, red semi-sweet wine continues to be a consumer favourite worldwide. (Castriota, 2020)

Twenty countries accounted for 96% of all wine exported globally in 2021. Georgia climbed one spot from the previous year to 14th place, with an export value of USD 234 MLN. The export of wine is important for Georgian trade abroad. Fresh grape wine accounted for 6% of Georgia's total exports in 2021, which was its fourth-largest share ever. In contrast to 2019, the COVID-19 outburst in 2020 caused Georgian wine exports to decline by 6%. In 2021, the total amount of wine exported from Georgia increased substantially over the previous year and hit a record high. In 2021, Russia continued to be the largest consumer of wine from Georgia. Its percentage of Georgian wine exports fell to its lowest level since exports to Russia commenced. Following Russia in 2021, major shares of Georgian wine exports went to China (7%) and the CIS nations (10%), Ukraine (10%), and the Eastern EU (10%). Poland (61%) and the Baltic nations (38%), which are in Eastern Europe, were Georgia's top export destinations in 2021. Germany (59%), Sweden (11%), and France (8%), together with other Western European nations, were the primary importers of Georgian wine. The top three CIS nations were Belarus (48%), Kazakhstan (42%), and Moldova (3%). (Alavidze, 2022)

After the embargo, efforts have been made to increase consumer knowledge of Georgian wine in key markets like Poland, China, the Baltic States, the United States, the United Kingdom, Germany, and Japan. The target markets demanded higher-quality goods to enter. As a result, Georgian winemakers began to focus on the quality of the grapes and the wine-making process. According to the Georgian Wine Agency (GWA), quality control of Georgian wines improved in 2021. Exports to critical markets increased by 20% in comparison to 2019 despite the epidemic. Since March 2022, when the conflict between Russia and Ukraine first broke out, the Georgian wine industry has been paralyzed. In the first two months of 2022 compared to the previous year, the Georgian wine sector saw positive cumulative growth; however, with the start of the conflict, the trend has reversed and moved into the negative growth range. In March, exporting businesses from Georgia were awaiting further clarity regarding the emergency. Following the favourable outcome in May of the same year, the growth rate resumed its downward trend in June of that same year. In 2022, the cumulative growth rate of all Georgian wine exports showed a slight dip. (S.M.C. Loureiro, 2017)

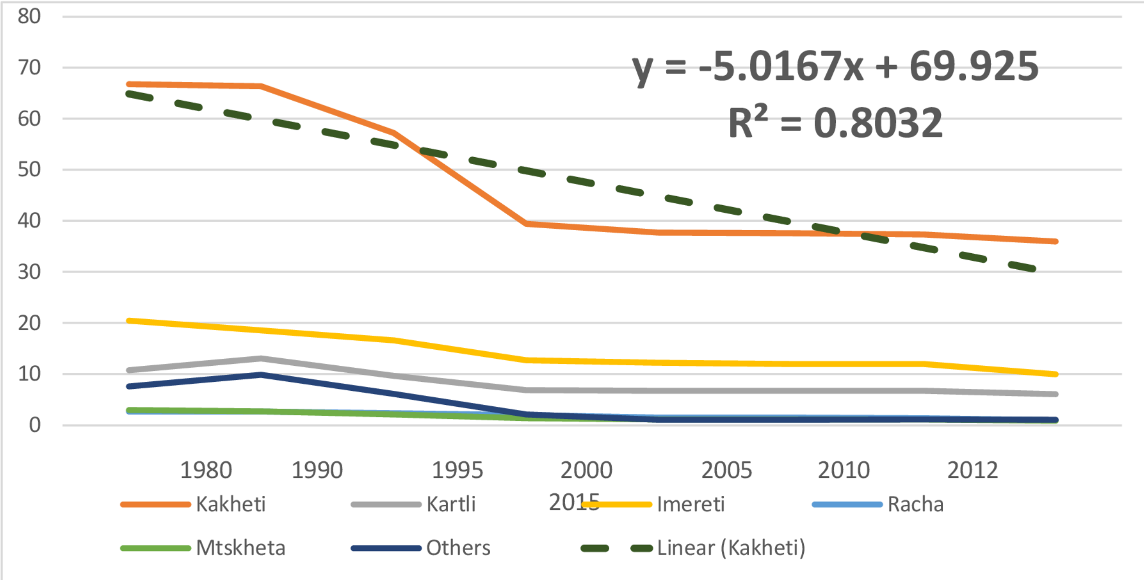
Red wine exports now make up 75% of all exports in 2021, substantially outpacing white wine exports over the years. Red semi-dry wine, red dry wine, and red semi-sweet wine make up the majority of the wine. Red wine exports continue to be dominated by Alaznis Veli (Red), Kindzmarauli, and Saperavi, accounting for 60% of all wine exports in 2021. The key markets for Georgian wine, the CIS and Eastern EU nations, have a significant affinity for red semi-sweet wines, which accounts for the high proportion of red semi-sweet wines in Georgian wine exports. The pandemic painted a clear picture of the relationship between tourism and local wine consumption in Georgia. Domestic consumption, which made up 19% of total revenue in 2020, fell by 43% in dollar terms. As a result of the tourism sector's improved performance in 2021, domestic wine consumption increased again. (Currin & Robinson, 2022)

4 Practical Part

4.1 Area Harvested

Special features were observed in the development of viticulture and winemaking during the period of transition to the market economy, from 1990 to the present. During this period, the area of vineyards in Georgia decreased by 44 percent. The reasons for this were mainly the low purchase prices of grapes, the loss of the key market, poor control conditions, the collapse of the industry's infrastructure, a deep crisis in all sectors of the public economy, and the difficult socio-economic conditions of the population. In the 1980s, the area of the vineyard was 127 thousand hectares (ha), and currently, its area does not exceed 60 thousand hectares (ha).

Figure 3. Area of vineyards in Georgia in 1980-2015(ten hectares)



Source: Data from Geo stat, own representation

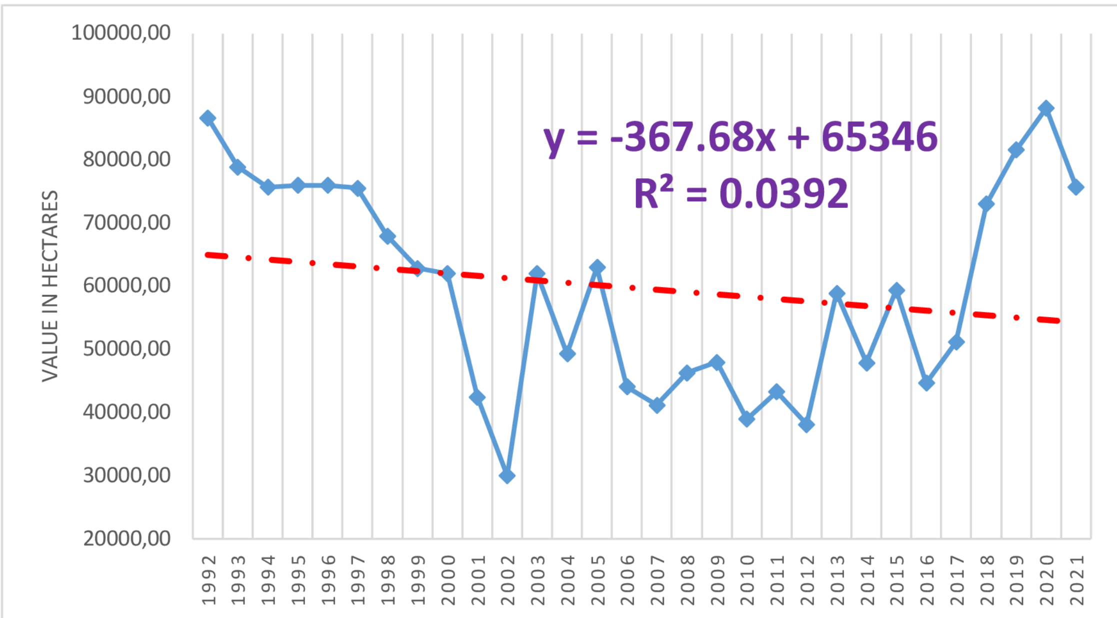
The main characteristic of the period of transition to a market economy was the creation of a private structure that competed with the public sector.(Okrotsvaridze, 2008) The vineyard areas were moved to other low-intensity areas, which was caused by the following circumstances: the purchase prices of the vines were low, which forced the poor peasant to uproot the vine seedling. Almost destroyed vine nurseries that produced seedlings of different varieties and growing vines in vineyard areas has increased.

In Figure 3, the Kakheti region leads with the area of vineyards from 1980 to 2015. In the time interval of 1995 and 2000, there was a rapid decline in area. Downfaced trendline is the answer for this claim, however, further data depicts the negative stability. During this period fungal infections and viral plant diseases were massive which caused the sudden decrease in the area of vineyards. On the other hand, from 2000 until 2015, the area of vineyards was at almost the same level. After applying a simple linear regression model it is safe to say that there is a strong correlation between the two given variables, since R-squared is 0.8032, which is close to one. Simple regression model enables us to say that in this specific case there is a linear relationship between the variable 'year' and 'area of vineyards'. What's more, the trendline has a negative slope number (Y= -5.0167X+69.925), which can be interpreted as a momentary negative relationship among variables. Due to the fact that, during 1980 and 2010 the area of vineyards was not just increasing. So whenever the variable 'year' went up, variable 'area of vineyards' decreased.

As for the total value in hectares for the area harvested from 1992 to 2021 the trendline is negative with negative slope value, showcasing the negative relationship between the variables as a whole. (See the Figure 4) $Y = -367.68X + 65346$, $R^2 = 0.0392$ Received equation strongly suggests the nonlinear relationship between the two variables.

4.2 Yield

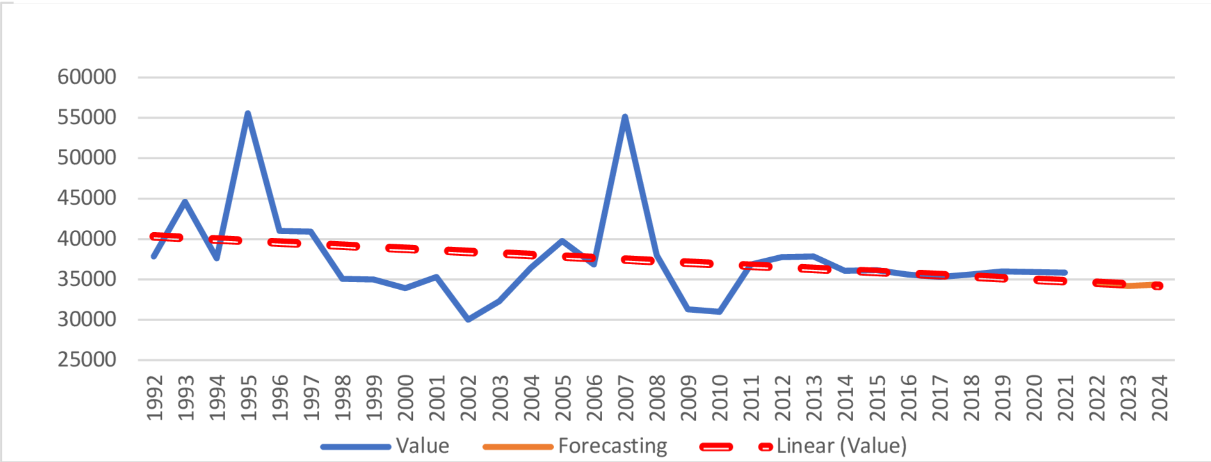
Figure 4. Area harvested of vineyards in Georgian all regions. (1992-2021)



Source: FAO, own representation

The yield in viticulture (growing grapes) is an indicator of crop yield since it quantifies the volume of wine or grapes produced per square foot of vineyard. The quantity of grapes per vineyard area and the volume (in liters) of wine per vineyard area are the two types of yield metrics that are frequently utilized. Since lower controlled yields are linked to wines with more concentrated, complex flavors, and since the maximum permissible yield in many wine regions is strictly regulated for many wine styles and appellations around the world, yield is frequently seen as a sign of quality. In Europe, the amount of wine produced per hectare is expressed in hectoliters. The yield in other wine-producing regions of the world is assessed in tons per hectare or by the mass or weight of the grapes, which is measured in tons or kilos per hectare, as it is the case of Georgia. Grape output per hectare is anticipated to increase in Georgia because of these advancements, and there is potential for this to happen: the estimated total current production is 5.3 tonnes per hectare, which is significantly less than the 2021 global average. Most vineyards are held by households, which use production techniques that are technologically archaic, according to the national wine agency, which also points out that Georgia's largest wineries have yields that are comparable to those found globally.(G&T, 2021)

Figure 5. Yield of Grapes (1992-2024)



Source: FAO, own calculations

As it is shown on the Figure 5, highest peaks of yield were captured in 1995 (55579 hg/ha) and 2007 (55170 hg/ha) both in Kakheti region. In comparison lowest values are seen in 2002 (30000 hg/ha) and in 2010 (30963 hg/ha) in Mtskheta region. Constant level of yield is seen from 2014 until 2021, with slightest changes where values varied from 36030 hg/ha to 35843 hg/ha.

4.2 Production

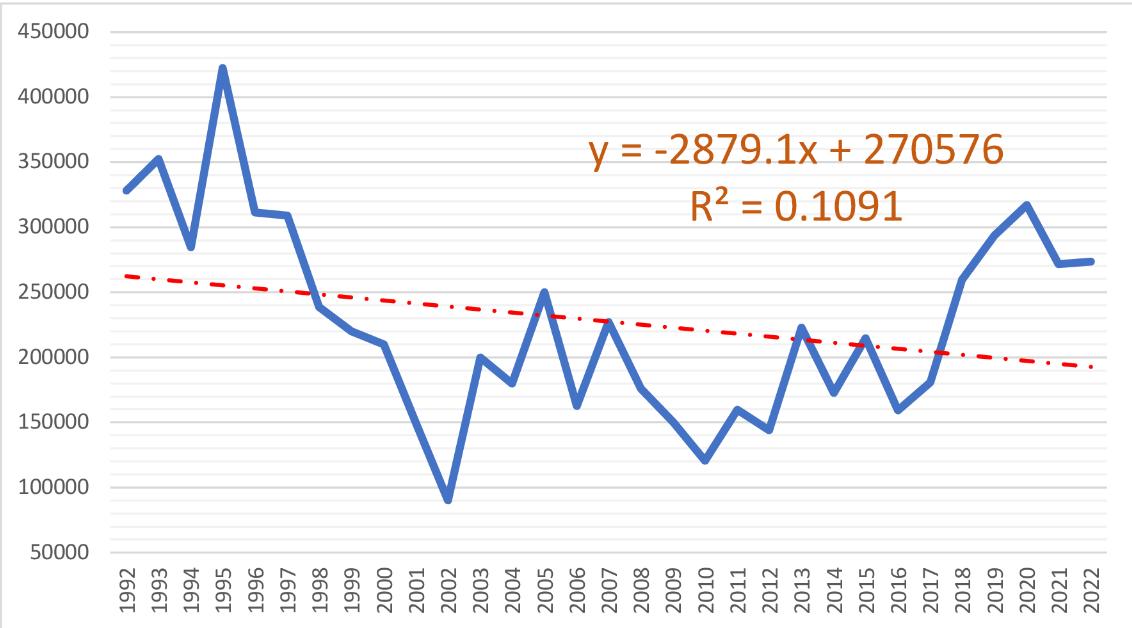
Grape has always been an important commodity for Georgia. Its production history varies from time to time. The analysis of grape production according to regions showed us that Kakheti and Imereti regions still play a leading role in the development of viticulture and winemaking in Georgia.

In 2006, compared to 1992, grape production decreased significantly. The unstable political and economic situation in the country caused a major decrease in grape production. Due to non-reimbursement of the self-value of the grapes handed over by the population over the years and the suspension of internal sectoral integration processes, the desire to replace perennial crops with annual crops, and the cessation of vine seedling production. the failure of agricultural equipment necessary for viticulture, lack of fertilizers and toxic chemicals, the difficult socio-economic conditions of the winegrowers, the insufficient level of knowledge of the winegrowers and others. The priority place of viticulture and winemaking in the Kakheti region in the country's economy is indisputable, but since 1995, with few exceptions, no vineyards have been planted on new areas, no more grafted vine seedlings are produced, greenhouses and nurseries equipped with the latest equipment and technological lines located in the Kakheti region have stopped functioning, and the root beds have been destroyed. However, situation has improved for some time and again the decrease continued. The main problems have always been the political or economic. (Okrotsvaridze, 2008)

Once Russia lifted the embargo in 2013, Georgian wine output began to rise. However, the Russian economy entered a crisis in 2014, which caused a decline in Georgian wine production in 2015. In order to mitigate the dangers associated with dependence on Russia, the Georgian wine sector has increased its attention on diversification into alternative markets. (Surmava et al., 2022) Higher grade wine was necessary for the new target markets. In order to manage the wine quality from the start of production by selecting their own crops, land and fertilizers. Georgian wine firms began to buy vineyards. To assist wineries in meeting the demand of the international wine market, the government of Georgia and Georgian wine academy jointly took part in wine quality monitoring. The GWA estimates that in the regions of Kakheti and Racha, the total registered vineyard surface area in 2021 was 40K hectares.

As a matter of fact, Georgia had a sudden jump in temperatures in 1994, akin to what occurred in Western Europe in the late 1980s. The gradual dilution of the Atlantic circulation signal when it enters the European continent may be the cause of this delay. Higher altitudes, where more ideal thermal conditions were produced, saw a greater impact of the temperature increase on grapevine phenology.(Okrotsvaridze, 2008)

Figure 6. Production Quantity in Georgia 1992-2022

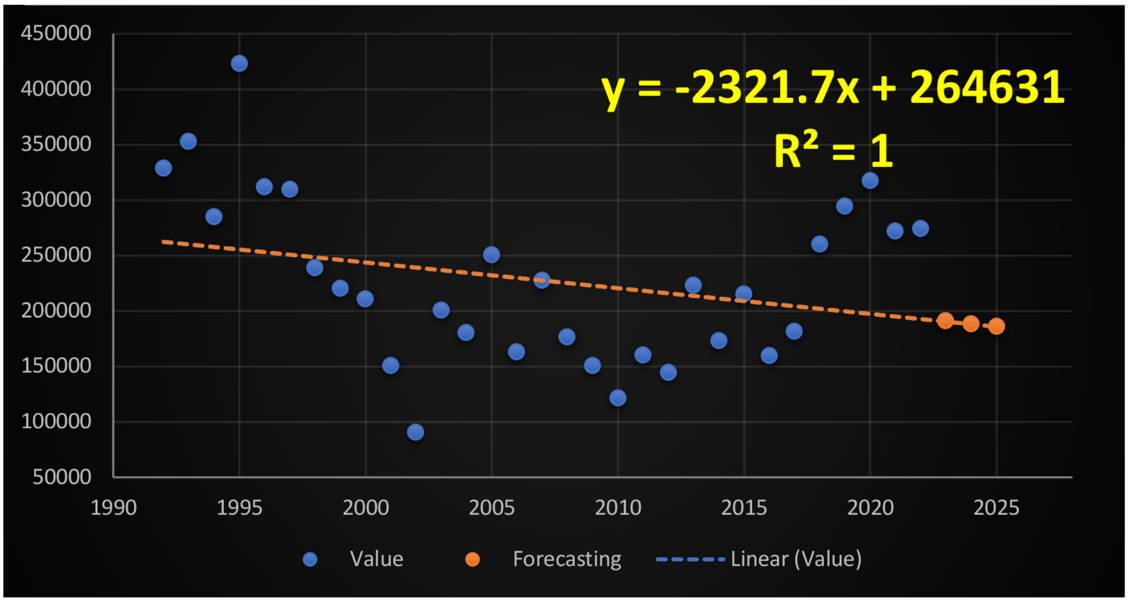


Source: Data from the FAO stat. Own work

Since 2016, Georgia's wine output has been increasing, hitting a peak of 14 MLN hectoliters in 2019. In terms of dollar value, Georgian wine production fell by 16% in 2020 compared to the previous year. The Covid-19 epidemic is partially to blame for the issue. Logistics bogged down as Georgian wine producers were unsure about their future export options. Due to these, Georgian winemakers have decided to preserve the natural wine and use the stock in more prosperous times. Due to the lockdowns, domestic wine consumption was not an option. Even though the epidemic persisted in 2020 with certain limits, wine output saw a 24% increase in value, reaching its highest level, which is depicted in the Figure 6.

After applying the linear regression model, the received equation turned out to have a negative slope and it looked like following, $Y = -2879.1X + 270576$ and $R^2 = 0.1091$. The value of R squared is close to zero amounting 0.1091 and slope is a negative number (-2879.1x) while Y-intercept equals to 270576. R-squared is close to zero, meaning there is no correlation. There is no linear relationship between X variables (year of production) and Y variables (Value in tonnes). What's more, the trendline is with a negative slope which indicates the negative relationship between the given Year and Value variables. When variable X goes up, variable Y tends to go down. To interpret the production value was not in a correlation with every upcoming year. +1 year did not necessarily mean that the production value would go up.

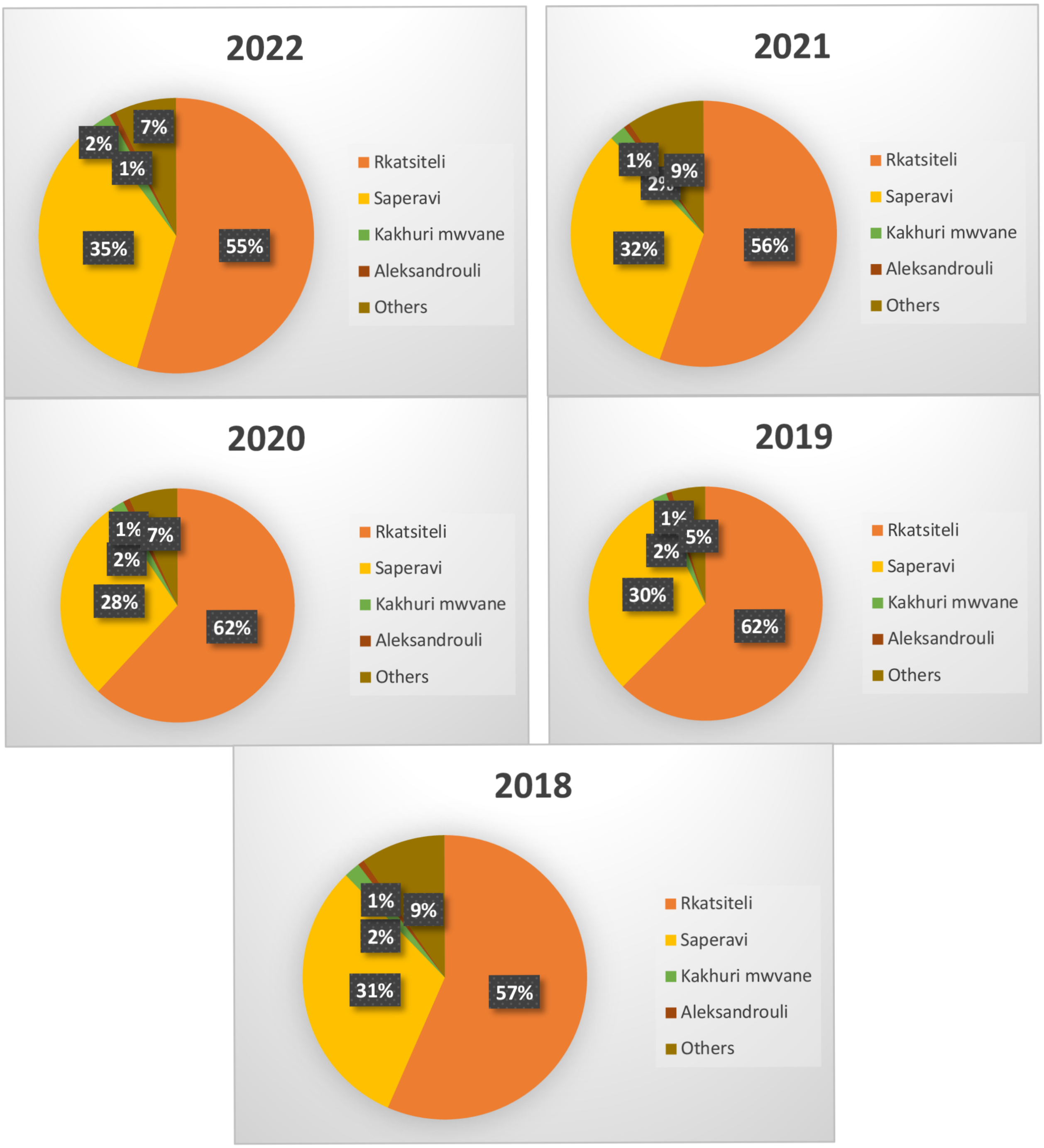
Figure 7. Production quantity and forecasting for years 2023,2024,2025



Source: Data collected from FAO, own work

The next step was to forecast what would the production quantity be in the following 3 years. And according to the graph below, it is quite certain to say that negative linear trendline is still looking downwards, which means that the following years production is predicted to be the less in value compared to the previous years.

Figure 8. Grape harvest in 2018,2019,2020,2021,2022 by type

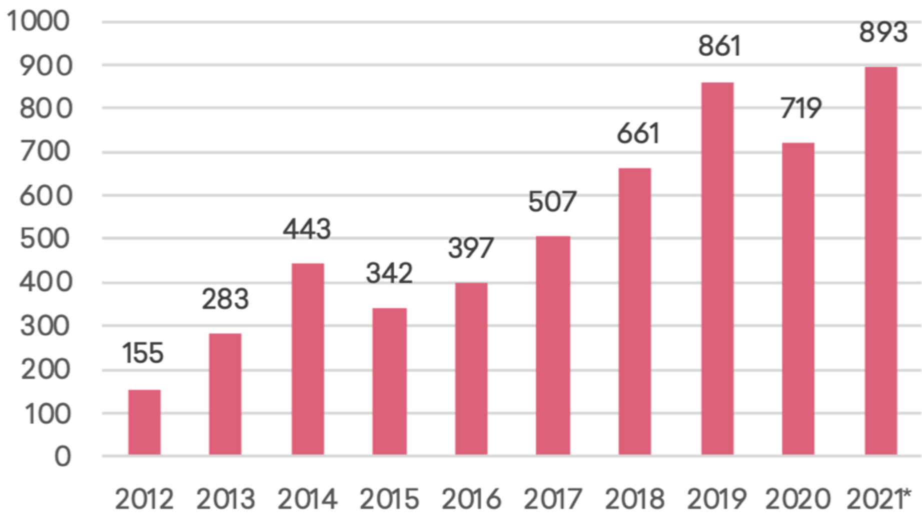


Source: National Wine Agency

Interestingly, white grapes have historically made up a sizable portion of the crop in Georgia. Red grapes made up 32% of the entire crop in 2021, a rise from the previous year. In 2021, there were fewer grapes processed overall. The Georgian white grape known as Rkatsiteli has historically held a sizable portion of the processed grapes. Compared to 2020, Saperavi's share increased by 5%. In comparison to the prior year, the share of other grape types, such as Kakhuri Mtsvane and Alexandrouli Mujuretuli, decreased by 3%. The growing demand from the wine companies for multiple grape variety can help to explain the abnormally high share of 'other' section in the total processed grapes in 2018.

In terms of dollar value, Georgian wine production fell by 16% in 2020 compared to the previous year. The Covid-19 epidemic is partially to blame for the issue. Despite the pandemic continuing in 2021 with certain restrictions, wine output climbed by 24% in value and reached its highest level as a result of a particularly bountiful harvest in 2020, starting in that year. The total grape harvest has been increasing since 2016, and in 2020 it reached its highest level. In 2021, the trend changed and started to fall. The cause is connected in part to the severe hailstorm that hit the Kakheti region towards the end of the summer of 2021.(Surmava et al., 2022)

Figure 9. Wine Produced in Georgia-Value (MLN,Gel)



Source: Geostat

It is not a surprise that grapes are included in one of the most produced commodities in Georgia. With the estimated values grapes stand on the tenth place with the value of almost 225951 tonnes. Compared to the most produced item-milk in total Grape is 2.5 times less produced.

Table 2. The most produced commodities in Georgia.

Item	Value in Tonnes
Milk, Total	593 538
Raw milk of cattle	579 432
Fruit Primary	563 348
Cereals, primary	491 828
Hen eggs in shell, fresh	453 287
Maize (corn)	311 469
Potatoes	284 123
Roots and Tubers, Total	284 123
Vegetables Primary	275 634
Grapes	225 951

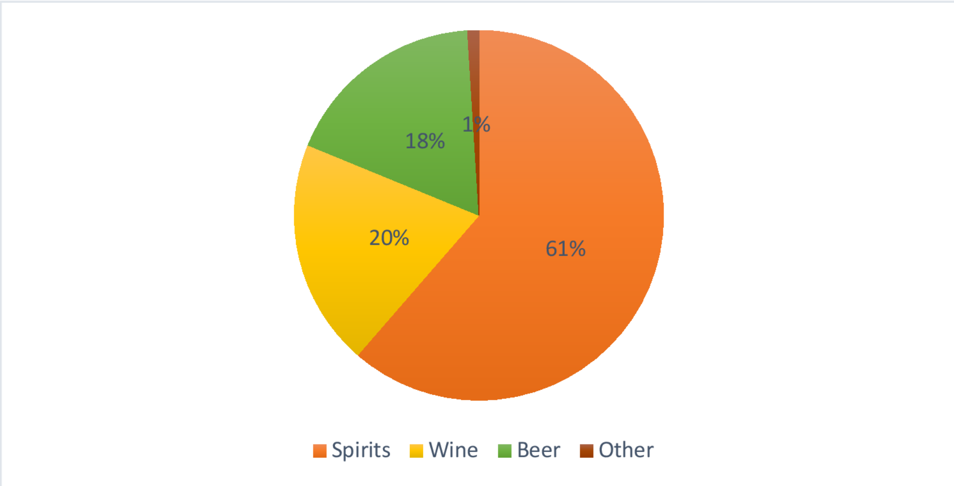
Source: Geostat

4.3 Consumption

The consumption level does not correspond with the production level. The ratio of produced wine in Georgia and domestically consumed wine would be very high, meaning that Georgia produces way more than uses within Georgia.

According to the World Health Organization wine is not the most consumed alcohol in Georgia. Wine and beer almost have the same position with 18% and 20%. However, there is quite well-known spirit called ‘Chacha’ which is highly consumed by Georgians.

Figure 10. Recorded adult (15+) alcohol consumption in Georgia



Source: WHO

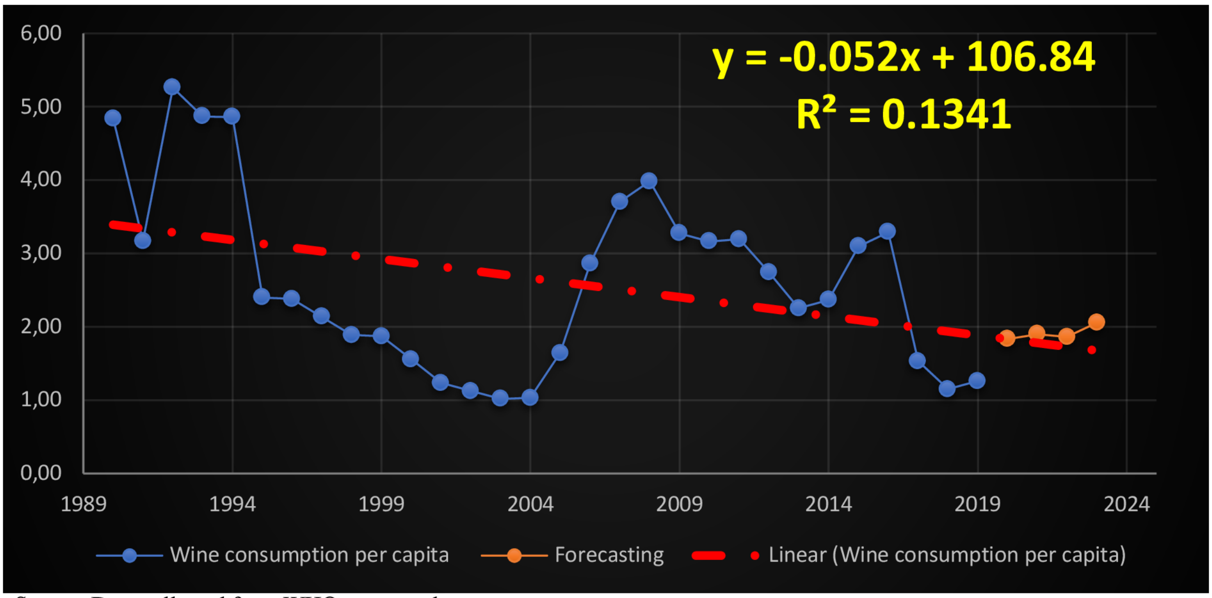
With easing COVID-19 pandemic limitations, reopening the HORECA sector, and a sluggish tourism rebound in 2021, the world's wine consumption increased and reached 236 MLN hectoliters. Georgia historically has consumed far less wine than the top wine-consuming nations due to its tiny population and emerging economy. Surprisingly, domestic wine consumption increased by 17% in 2022 compared to 2020, as a result of loosened COVID-19 limitations and a rebound in tourism.

Figure 11. Main Wine Consumer Countries and Georgia, 2018- 2021 (MLN, HL)

Source: Geostat, TBC Capital

It is well shown in the Figure 11 that Georgia is very low in wine consumption compared to the main wine consumer countries. Wine consumption has been steadily decreasing every year since 2010, when per capita consumption was 29 liters. Domestic wine consumption continued to fall over the years, reaching an all-time low of 24 MLN liters in 2022. Generally, according to the global trend, generations in customer segment tend to apply ‘switching’ from alcoholic drinks to non-alcoholic beverages which alternation reduces the consumption of wine specifically. (Campbell, 2022) Ninety-nine percent of the wine consumed in Georgian households is self-produced. (Surmava et al., 2022)

Figure 12. Wine consumption per capita and forecasting



Source: Data collected from WHO, own work

After applying a simple linear regression model to the consumption per capita data, it is understood that the relationship between the two suggested variables is not strong. $R^2 = 0.1341$ and the value is close to 0, which suggests that the selected data does not showcase a good linear relationship between the "year"’ and "consumption per capita’ variables. What’s more, the slope equals -0.052X, which is a negative result assessing the negative association between the presented variables. Such a result was simple to predict since wine consumption in Georgia has had its ups and downs throughout its history. In the early 90s, due to social and political reasons, grape production decreased, especially in the Kakheti region. Farmers were no longer eager to take care of vineyards due to the fact that they did not feel appreciated by the government. For that reason, grape production in the Kakheti area and in Georgia as a whole is decreasing almost every year. High rates of decline were observed in 1996-2002. In addition, if in 1990, 62.8% of the grapes produced in Georgia were produced in Kakheti, this figure gradually decreased over the years, and in 2006, it was 50.9%.(Okrotsvaridze, 2008)

Additionally, in 2012 4600 acres of vineyards were damaged as strong winds and hail struck the Georgian municipalities of Kakheti, Kvareli, Telavi, and Gurjaani which is also seen on graph where the line shifts downwards. Around 80–100% of the vines in 15 villages in Kakheti have been devastated. Kakheti holds the biggest percentage of grape production, which has huge implications for further consumption. (Okrotsvaridze, 2008)

After applying *forecasting formula* on excel, from the graph, the results vary from 1.833089 to 2.057085. Such outcome suggests the vast increase in the future wine consumption per capita in the next 4 years.

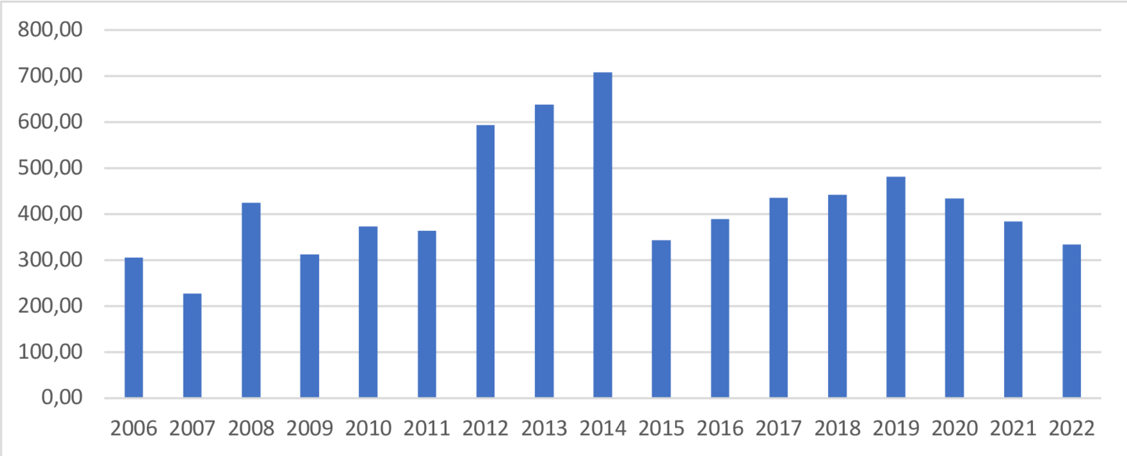
4.4 Price of wine

The export of Georgian wine in the first quarter of 2015, compared to the same period of the previous year, significantly decreased. In January-March, slightly more than 5 million bottles were exported from Georgia to 25 countries around the world, which is 67% less than the data from the first quarter of 2014.

The rising exports of Georgian wine started to decrease. According to the National Wine Agency, the decrease in exports is mainly explained by the decrease in demand in the two main markets for Georgian wine: Russia and Ukraine. Due to the sanctions imposed on Russia and the devaluation of its national currency, the export of Georgian wine there decreased by 83%, and in Ukraine, it decreased by 63%. Instead, the volume of exports to other countries is increasing, but their share is so small that the total volume of exports is still declining.

All of these were determining factors for the wine pricing which identically caused serious decline in value in the first half of 2015. Which is clearly seen in the graph below.

Figure 13. Producer price value from 2006 to 2022. Price in USD

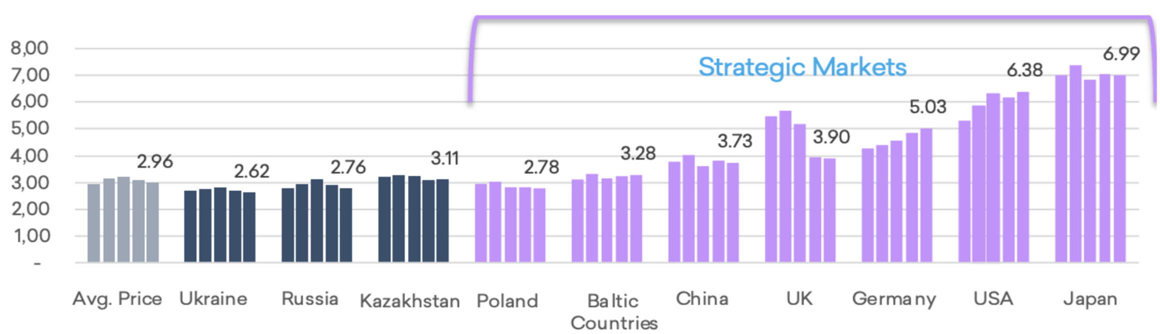


Source: FAO

4.4.1 Prices on export markets

From 2017 to 2019, the average price of Georgian wine exported showed an upward trend. The pandemic and the emphasis on cheaper markets lowered the average price in 2020 and 2021. Georgia's export portfolio is dominated by Russia and Ukraine, which will account for 66% of all exports in 2021. Since 2020, the average price of wine from Georgia has been falling in various markets due to COVID pandemic, which has also lowered the average export price. (Mosiashvili, 2021) In Germany, the United States, and Japan, Georgian wine is the most expensive, which varies from 5 to almost 7 dollars, relatively. The increased volume of wine being carried to the low-cost export destinations may be a contributing factor in the decline in the price of Georgian exports.

Figure 14. Average Import Price of Georgian Wine to Selected Countries 2014-2021 (USD/liter)

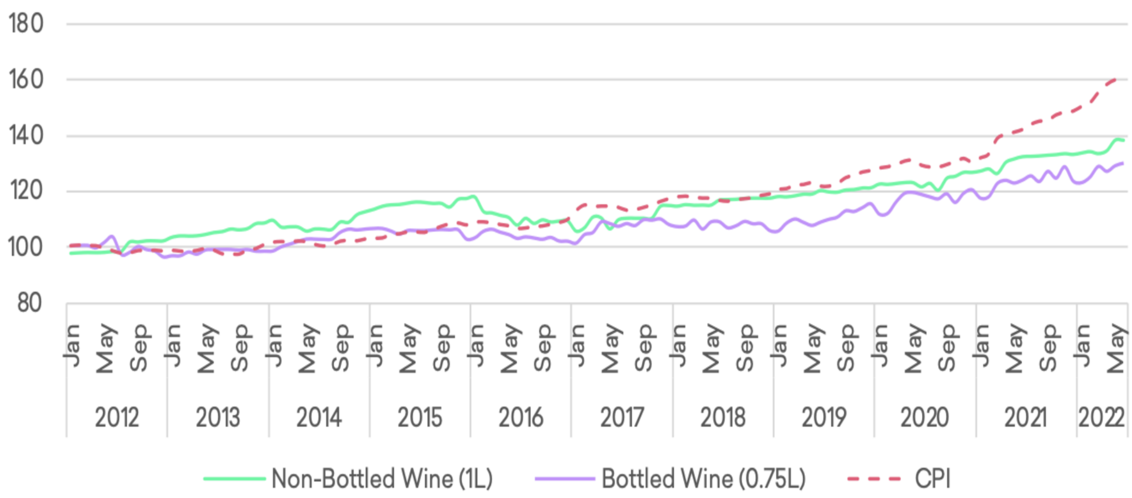


Source: Geo stat

4.4.2 Prices on local market

Domestic Georgian wine costs are rising at a slower rate than overall prices over time. The consumer price index (CPI) increased by 60% between June 2011 and June 2022, whereas the cost of bottled and non-bottled wine increased by 30% and 38%, respectively. Over the years, there have been major changes in the price index for wine that is both bottled and unbottled. Over the past ten years, the non-bottled wine price index has increased more quickly than bottled wine prices as it is shown on the graph below. A change in the organizational makeup of the table wine providers may help to partially explain this. Table wine is being produced and sold by more and more businesses, which is displacing the unorganized market and raising the cost of table wine.

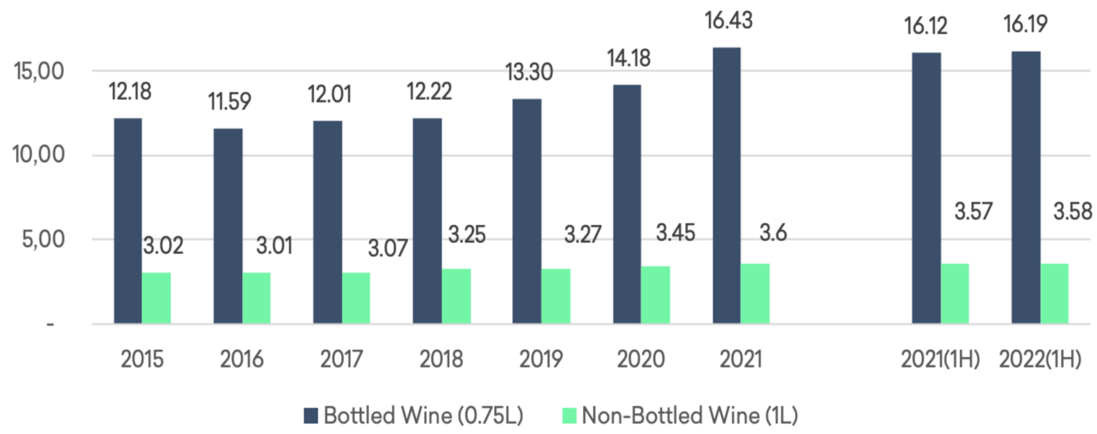
Figure 15.Wine Domestic Price Index in GEL (December 2011=100)



Source: Geostat, 2022

In comparison to 2020, the average retail cost of bottled wine climbed considerably in 2021. In the first half of 2022, the year-on-year growth trend is still increasing, primarily due to growing production and marketing costs. As it is depicted on the graph below the prices of non-bottled wines are merely changing, this could be the reason associated with the less marketing and manufacturing costs comparing to the bottled wine, which packaging goes through much more details.

Figure 16. Average Retail Price of Bottled and Tap Wine (1L) on Georgian Market (GEL)

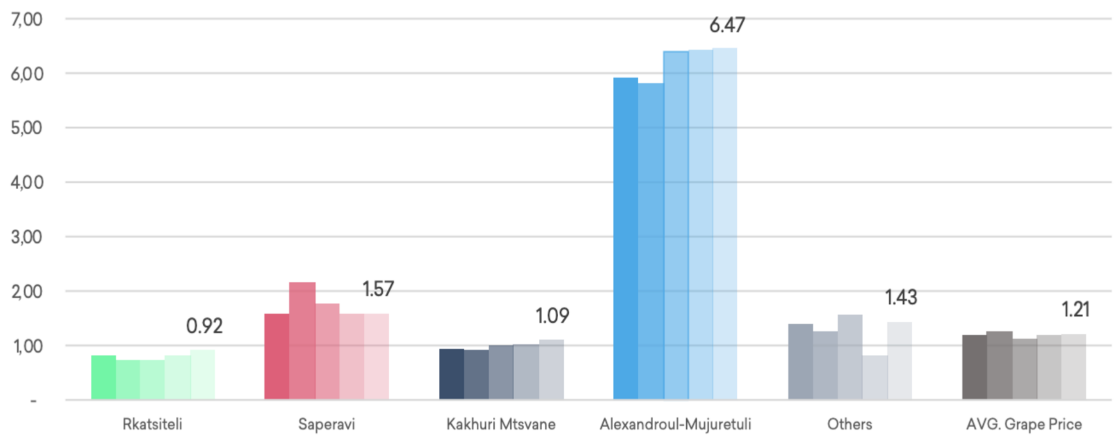


Source: Geostat

4.4.3 Grape Prices

Georgian wine producers rely on the global wine market because a large portion of their revenue comes from export. It influences the price wine makers are willing to pay for the grape in a significant way. The Georgian government's annual announcement of its subsidy program also affects how much grapes are in demand. The harvest is another aspect that affects pricing; supply will be heavily determined by weather, which will affect price. The yield of processed grapes drastically decreased in 2021, which led to a small gain in the average grape price over the year before.

Figure 17. Average Harvested Grape Prices by Species (GEL/Kg): 2010-2021



Source: Geostat

When compared to other species, the Rkatsiteli grapes are substantially less expensive. The harvest is dominated by Rkatsiteli, which lowers the market price. After the increase in 2018, the average price of Saperavi continued to decline. Compared to Rkatsiteli or Saperavi, Alexandrouli-Mujuretuli grapes are more expensive and in little supply. Since, it is scarce in supply Alexandrouli is perceived to be exclusive and people are always willing to pay more.

4.5 Export and Import

According to the information of the National Wine Agency, 96 150 065 bottles of wine were exported from Georgia in the 11th month of 2021, which is the highest indicator in the history of independent Georgia. In addition, the amount of exported wine has increased by 14% annually. The agency's already exported gross revenue reaches 222 million USD, which is 4% higher than the same growth in 2020.

Table 3. Exported bottles of wine by country in 2021, 2018, 2015

	2021	2018	2015
Country	Bottles	Bottles	Bottles
Poland	5 908 393	3 508 122	1 600 302
China	5 469 450	6 951 019	2 672 154
USA	971 714	466 056	248 075
Lithuania	9 609 28	488 154	658 666
Canada	317 692	256 874	157 836
Czechia	141 432	44 556	35 674
France	84 028	46 786	37 956
Kazakhstan	3 775 978	3 599 143	5 195 949
Russia	55 867 692	53 682 627	18 308 177

Source: Geostat

According to the data of 2021, the share of exports to the Russian market made up 57% of the total amount of exports, which is the lowest figure both before the embargo (when 87% was occupied by the Russian market) and taking into account the following years of the embargo's cancellation. It should be noted that in the history of independent Georgia, the export of Georgian wine to the United States of America exceeded 1 million bottles for the first time.

"441 companies exported different volumes of wine from Georgia, while in 2012, only 120 companies had the opportunity to export wine," the agency's statement reads.(Varadashvili, 2022)

In 2015, it is noteworthy that the total export rate has decreased only in comparison with 2014 and 2013, when the Russian market was opened after several years of embargo, and exports to this country reached their peak. For example, in 2012, only 23.3 million bottles of wine were exported, in 2011 - 19.0 million bottles, in 2010 - 14.8 million bottles, in 2009 - 10.9 million bottles, in 2008 - 12.2 million bottles. (Mtvralashvili, 2016)

In 2018, 86.2 million bottles (0.75 l) of wine were exported from Georgia to 53 countries of the world, which is a record figure of the last almost 30 years. The growth compared to 2017 reached 13%. The value of exported wine reaches 203 MLN US dollars, which is 20% higher than the same rate of 2015. (Kerdikoshvili, 2019)

According to their reports, as a result of the export of wine, brandy, chacha, brandy spirit, and bottling brands, an income of up to 400 million USD was obtained, which is 18% more than the figure for the same period in 2020 and 142% more compared to 2012, which was equal to 163 million USD.

The top ten companies that exported the most valuable wine in 2022 according to the Geostat:

1. Askaneli Brothers Ltd
2. Kakhuri traditional winemaking LLC
3. LLC Tiflissky Winni Pogreb
4. Dugladze Wine Company LLC
5. JSC Tbilghvino
6. SS Badagon
7. JSC Kotekhi-Gurjaani Winery
8. JSC Telavi Wine Cellar
9. Bolero & Company Ltd
10. GVMT Group Ltd.

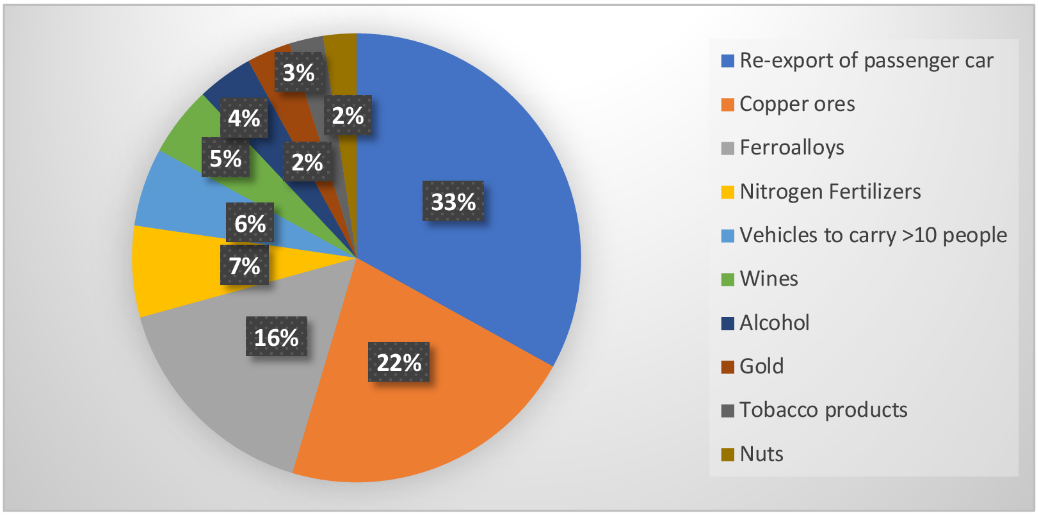
In order to diversify the export markets of Georgian wine, with the financial and organizational support of the National Wine Agency, in 2023 Georgian wine will be actively represented in the United States of America, Great Britain, Germany, Poland, the Baltic countries, China, South Korea and Japan.

According to the information of the National Wine Agency, the contractor organizations of the agency will implement various targeted measures in the mentioned strategic markets. Along with this, Georgian producers will participate in all important international exhibitions of wine and alcoholic beverages.

4.5.1 Products exported from Georgia

Geostat published the report showing the January 2023 foreign trade. According to the document, goods worth 459 million dollars were exported from Georgia to foreign countries during the January month. This amount is 38.5% more compared to 2022 year. In the ranking of the largest export goods, light vehicles moved into first place, and copper ores took second place. (Tkeshelashvili, 2023)

Figure 18. Ten most exported products from Georgia, in January in 2023



Source: Data collected from Geostat; pie chart created by the author

The export of nine of the top ten products has increased. The decrease is recorded only in the export of nuts. To have a better understanding of how much wine is exported from Georgia, above is a pie chart with the ten most exported products in Georgia.

According to National Statistics Service data, Georgia exported 23,742 tons of wine worth 73,249 million dollars between January and May of this year. In the same period last year, Georgia sold 26,189 tons of wine worth 82,613 million dollars abroad. Accordingly, Georgian wine exports decreased by 11.3% in the reporting period compared to the previous year.

Figure 19. Georgian wine export, volume, and income from export

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020(Jan-May)
Bottle (mln-0.75 litre)	23	46	59	36	50	76	86	94	24
Price (mln US dollars)	65	128	185	96	87	170	203	240	73

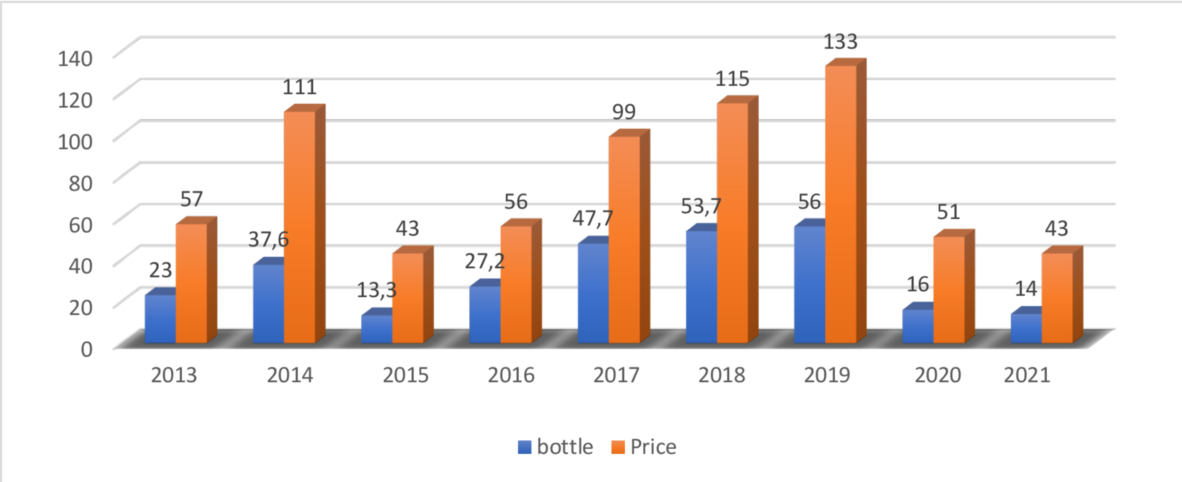
Source: National Statistics Office, 2020

The Figure 19 shows the volume and income from wine exports in Georgia between the years of 2012 and 2020 first half. According to the provided table, reported income has mostly increased since 2012. However, we can see the sudden decline in 2015 and 2016, where the income has almost halved, from 185 million dollars straight down to 96 and 87 million dollars. The decrease in exports is related to the economic crisis in the three largest markets for Georgian wine: Russia and Ukraine, due to which wine transshipments in these countries decreased by 53 percent.

Despite the decline in exports, Russia remains the main market for Georgian wine. The first five, according to wine exports, look like this in 2021: (Varadashvili, 2022)

1. Russia – 62 115 759 bottles (0.75 l)
2. Poland – 7 003 031 bottles (0.75 l)
3. China – 5 934 937 bottles (0.75 l)
4. Latvia – 1 900 519 bottles (0.75 l)
5. USA – 1 084 278 bottles (0.75 l)

Figure 20. Georgian wine exports to the Russian market in 2013-2021, million bottles (0.75) and million dollars



Source: Geostat

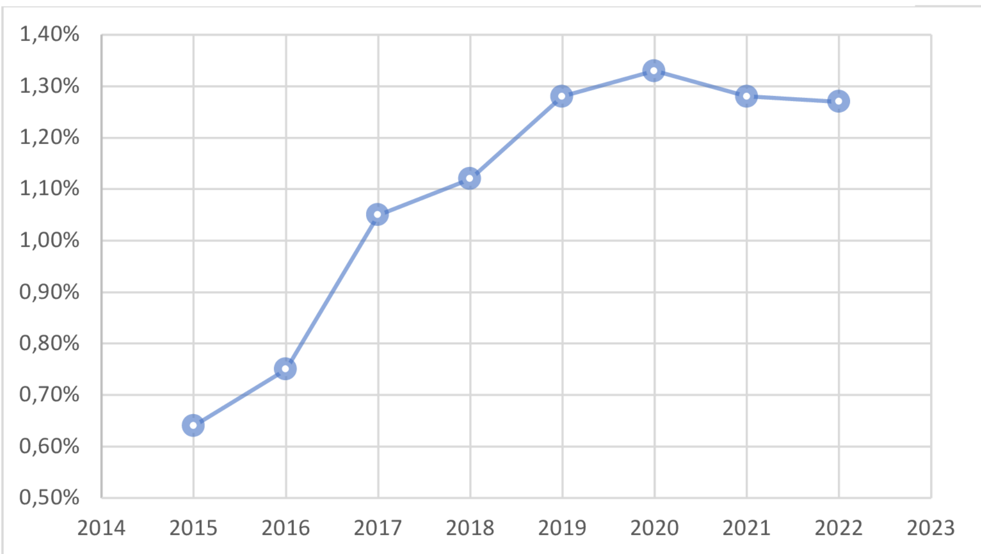
As can be seen from the graph, Russia's share in total wine exports has been characterized by an increasing trend since 2015. Despite the fact that in recent years Georgian wine has been exported to more and more countries every year and new markets are being exploited, the leading export market is still the Russian market. Therefore, the increase or decrease of Georgian wine exports depends on the Russian factor. As it is known, Russia banned the import of agricultural products from Georgia (including wine) in 2006, by the order of the chief sanitary officer of Russia, Gennady Onishenko, on the grounds of poor quality. The mentioned embargo caused a significant decrease in the export of Georgian wine. In 2006, Georgian wine exports amounted to 41 million dollars, and in the following year, wine exports almost halved to 29 million dollars. Georgian wine and brand exports to Russia were restored in June 2013. In 2013-2014, the export of Georgian wine increased significantly due to the lifting of the embargo on Georgian wine in Russia.

In 2015, the decline of Georgian wine exports was again caused by the Russian factor. This year, the unstable situation created in Russia and Ukraine had a significant impact on the export of Georgian wine and caused a 39% decrease in exports (96 million USD). The events that developed after June 2020 (Russia's threat to impose sanctions on Georgian products) once again showed that Russia is an unreliable trade partner, which often uses trade relations with Georgia for political purposes. Therefore, more effective steps should be taken to increase the awareness and popularization of Georgian wine in order to be less dependent on such an unstable market as the Russian market.

It should also be noted that the share of the current export market is still held by Russia, which is due to the fact that there are still market diversification problems in the wine sector, and the increase in the share of Russia in the total export leads to the encouragement of low-segment wine production. (Jmukhadze, 2022) Today, the average price of exported wine is 2.30 dollars, the determining factor of which is the large share of the neighboring country in the exported amount; in fact, it can be said that it itself dictates the selling price of the Georgian wine market.

The wine sector has a significant impact on the economic development of Georgia. Its share of total world exports is significant, and it was expected to grow from 2015 to 2021. According to the same data, wine is the fourth largest export product in the country. It should be noted that the share of wine exports in GDP is significant, and it has been increasing in tandem with GDP growth. (Jmukhadze, 2022)

Figure 21. Share of wine export in GDP



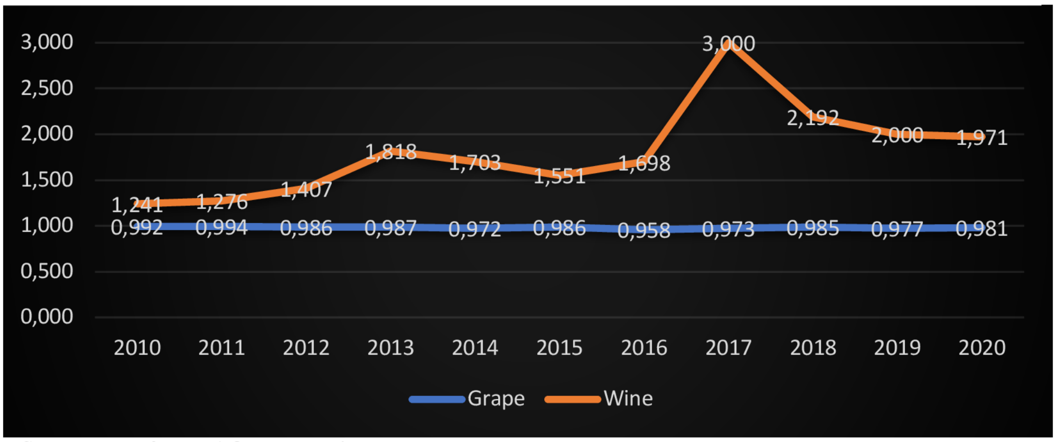
Source: Forbes, 2022

According to the data from Figure 21, the current average share of wine exports in GDP is 1.28%. And according to 2015 data, it was 0.64%. Therefore, it is clearly seen that the significant share of exports in GDP has increased over the last 7 years. Data analysis shows that the strongest positive correlation between wine exports and real GDP growth begins in 2018. The above data once again emphasises the important role of the wine industry in the economic growth of the country. The existing potential and significant influence of the wine sector in the Georgian economy are certainly noticeable. (Jmukhadze, 2022)

4.6 Self-Sufficiency

Self-sufficiency is a key success factor in a strong economy. Georgia has been promoting agricultural development for several years now. Georgia can help itself, become a self-sufficient state, and produce quality products to strengthen the population and the country as a whole. 7 billion GEL was invested so that not a single piece of land remains uncultivated in the country. Which will increase the production and self-sufficient percentage will lead to a high result. For that purpose, Self-sufficiency analysis was conducted from the year 2010 to 2020 of Grapes and wines separately in the same graph for the better illustration. Technically the concept of self-sufficiency is about the extent to which a country can satisfy its food needs from its own local production. Formula that was applied within the calculation of self-sufficiency rate (SSR) is following $\frac{\boldsymbol{Production}}{\boldsymbol{Consumption}}$. After applying the formula, the results were following:

Figure 22. Self-sufficiency analysis of Grapes and Wine (2010-2020)



Source: Data from FAO, own work

As it is shown on the graph SSR for Grapes within the years from 2010 to 2020 Always remains under 1 percent. As for the wine SSR it is always indicated as more than 1 percent.

Highest was seen in 2007 with the 3 percent of self-sufficiency rate. To interpret, if previously mentioned rate stays at the value of 1 or greater than 1 it means that country is self-sufficient. According to the data above Georgia is self-sufficient in wine commodity but not grape. Georgia exports great deal of wine worldwide which is discussed above. High self-sufficiency rate indicates that production is greater than domestic supply quantity and derived from the formula it helps to understand the importance of export in this specific case. From 2010 the rate was increasing steadily, with the similar amount of production and consumption ratio. However, in 2017s such high number is caused due to Georgia's win export in 2017. In 2016 the export of 0,75 L wine amounted 49,808,668 while in 2017 the number of exported wines amounted 76,663,225. Which is 1,5 times higher in comparison. As for 2018 and 2019, the self-sufficiency decreased to 219% and 200%. That could be explained as fair distribution of domestic consumption and international trade. On the other hand, Grape self-sufficiency rate always stays under 1% since its main purpose within the country is its own consumption locally and not used for the export.

5 Results and Discussion

Georgia is a very small country with exquisite culture and beauty. However, it is quite huge in the wine industry. The Georgian wine industry has been evolving since long ago, and after so many years, it has emerged on the global market.

During the Soviet Union, growers were forced to focus on quantity over quality. Even worse, under Gorbachev's rule, even the quantity was cut along with the amount of exports to Russia. The situation got better in the 1990s, and Georgia created its regional and international profile by growing over 500 grape varieties and using the majority of them for wine production.

Beginning in the middle of the 1990s, the sector began to show indications of revival, and by 2000, it had fully recovered. In 2006, exports to Russia were eventually prohibited. The shift from a centrally planned to a market economy was challenging and unpleasant, but it still took place. Fresh, independent wineries started producing wines and made an effort to market them internationally. The substantial reliance on the emerging Russian market (58% in 2021) and

the comparatively low knowledge of western markets are still one of the biggest concerns of the wine industry in Georgia.
Wine production is now booming, even though COVID-19 had a huge impact on overall production and consumption when domestic use was not an option and has been recovering since. Because Georgia has a small population and a developing economy, its wine consumption is significantly lower than that of the top wine-consuming countries. However, Georgia keeps the top position in wine production among the top wine-making countries.

According to the Geostat, wine export plays a big role in forming Georgia's strong wine sector. The biggest Georgian wine exporter has always been Russia. Even after setting restrictions, Russia was dominating. However, the share of purchased bottles has been decreasing and increasing over time. Based on the geo-political situation between Georgia and Russia, it is always unpredictable to assume what the situation will look like, even in a year. What's more, Jmukhadze suggests that the wine sector has a significant impact on the economic development of Georgia. Its share of total world exports is significant and is expected to increase over time.

6 Conclusion

This bachelor's thesis looked at specific characteristics and patterns in the growth of the wine market, using Georgia as an example. The major goal of the thesis was to assess how the Georgian wine market evolved from 1992 to 2021 and to identify the variables that affect prices and production on this market. A group of carefully chosen indicators that are utilised to keep tabs on the state of the market were employed in the analysis.
Based on the data that was compared, it can be seen that even though Georgia is a small country with a 7.8 MLN population, its role in the global wine-making industry is immense. Wine tends to be one of the most produced commodities in Georgia. What's more, on the global ranking of wine production, Georgia holds the 19th spot. As for the consumption, the country had its ups and downs. With the socio-economic struggles plus the pandemic, the situation is still improving, and it is predicted to increase in the following years.
The statistics have proven that exports play a determining role in Georgia's economy. The biggest exporter has always been Russia. Thus, the international diplomatic crisis influenced

the decrease in the export value of wine from 2006 until the lifting of the sanctions. According to the 2021 records, Georgia exported over 107 million bottles of wine to 62 different countries, which was the biggest number during the last nine years, and the sales generated 250 million dollars. The main exporters of Georgian wine are Russia, Kazakhstan, Ukraine (slightly less due to the Ukrainian-Russian war), China, and Poland.

According to the forecast, the equation trendline was showcasing a negative result in terms of production and year incompatibility. Which resulted in the identification that suggested two indicators were not enough to determine the prediction. However, the over 20 year-old history of grape and wine production suggests that socio-political, economic, and weather conditions, as well as soil preparation, are the indicators that determine and influence the forecast of the commodity's production.

The results of the study of self-sufficiency depict that Georgia is completely self-sufficient in wine, as opposed to grapes. The trends of area harvested, yield, production, and consumption are decreasing slightly, mainly due to insufficient harvest years, political disbalances with the strongest exporter, and hailstorms.

7 References

AgroNews. (2021, October 1). როგორ გადავაქციოთ ქვევრში ღვინის დაყენების „ქართული ტრადიციული მეთოდი“ მსოფლიო მეღვინეობის ერთ-ერთ მიმართულებად. *AgroNews.ge*. https://agronews.ge/rogor-gadavaqtsioth-qvevrshi-ghvinis-daqhenebis-qarthuli-traditsiuli-methodi-msophlio-meghvineobis-erth-erth-mimarthulebad/

Alavidze, nino. (2022, February 8). *Georgian wine export*. Agenda.Ge. https://agenda.ge/en/news/2022/276

Avariashvili Tamuka. (2021, July 13). *A Beginner's Guide to Georgian Wine*. NinoVino. https://ninovino.ch/blogs/news/a-beginners-guide-to-georgian-wine

Banks, G., & Overton, J. (2009). *Old world, new world, third world?* p.57-75.

Barbakadze, J. (2018, May 12). ქართული ღვინის მრავალფეროვნება. ქართული ღვინის მრავალფეროვნება. http://gasstronomyy.blogspot.com/2018/12/blog-post_32.html

Barisashvili Giorgi. (2022, September 6). ღვინის დაყენება შინაურ პირობებში, ყურძნის დაკრეფიდან – მარნამდე | აგროკავკასია. https://agrokavkaz.ge/dargebi/mevenakheoba/ghvinis-daqheneba-shinaur-pirobebshi-qhurdznis-dakrephidan-marnamde.html

Campbell, B. (2022, January 5). *Declining wine consumption a global trend – The Real Review*. https://www.therealreview.com/2022/01/05/declining-wine-consumption-a-global-trend/

Castellucci, F. (2010). *Traditional technologies and history of Georgian wine*. 162.

Castriota, S. (2020). *Wine Economics* (J. Turnbull, Trans.). The MIT Press. https://doi.org/10.7551/mitpress/11106.001.0001

Currin, T., & Robinson, J. (2022, February 21). *Wines of Georgia | JancisRobinson.com*. https://www.jancisrobinson.com/articles/wines-georgia

DENESH RAJ, E. (2021). Benefits of Red Wine -A Review. *Journal of Contemporary Issues in Business and Government, 26*(02). https://doi.org/10.47750/cibg.2020.26.02.246

Dunn, M. (2016). Wine: The tall tale of shiraz. *Proctor, The*. https://search.informit.org/doi/abs/10.3316/informit.899492184468417

Fleming, E. (2014, December 13). *The New World challenge_ Performance trends in wine production in major wine-exporting countries in the 2000s and their implications for the Australian wine industry | Elsevier Enhanced Reader*. https://doi.org/10.1016/j.wep.2014.12.002

Wine Law, (June 15, 2017). https://matsne.gov.ge/ka/document/view/3711533

Glonti, T. (2010). *Traditional technologies and history of Georgian wine*.

G&T. (2021, October 18). G&T: Georgian wine industry entering a new era. *Investor.Ge*. https://www.investor.ge/2021/10/18/gt-georgian-wine-industry-entering-a-new-era/

Jefford, A. (2023). Georgian Wine History. *Wines Georgia*. https://winesgeorgia.com/wine-history/

Jefford Andrew. (2018, May 21). *Wines of Georgia,Wine History*. Wines of Georgia. https://www.nationalgeographic.com/travel/article/sponsor-content-secret-birthplace-of-wine

Jenster, P. V., & Jenster, L. (1993). The European Wine Industry. *International Journal of Wine Marketing*, *5*(1), 30–73. https://doi.org/10.1108/eb008610

Jerlyn Jones, & Smith, J. (2022, September 23). *What are the benefits of drinking red wine?* Medical News Today. https://www.medicalnewstoday.com/articles/265635

Jmukhadze, N. (2022, August 1). ღვინის ექსპორტის როლი და გავლენა საქართველოს ეკონომიკურ ზრდაზე • Forbes Georgia. *Forbes Georgia*. https://forbes.ge/ghvinis-eqsportis-roli-da-gavlena-saqarthvelos-ekonomikur-zrdaze/

Kerdikoshvili, levan. (2019, January 21). ქართული ღვინის ექსპორტი: 2018 | პორტალი მეწარმეებისთვის. *business.org.ge*. http://business.org.ge/qartuli-ghvinis-eqsporti-2018/

Kharbedia, M. (2013, September 23). ღვინის კულტი და კულტურა. *Forbes Georgia*. https://forbes.ge/ghvinis-kulti-da-kultura/

Landgeist. (2022, March 25). Wine Consumption in Europe. *Landgeist*. https://landgeist.com/2022/03/25/wine-consumption-in-europe/

Lawrence, R. (2020, December 9). Myths and Legends About Wine. *Z&M Twisted Vines Winery and Vineyard*. https://zmtwistedwines.com/twisted-blog/myths-and-legends-about-wine/

Lortkiphanidze Davit. (2017, December). საქართველო—ღვინის სამშობლო [National Geographic]. *National Geographic Magazine - საქართველო*. https://nationalgeographic.ge/story/saqartvelo-ghvinis-samshoblo/

McIntyre, D. (2015, August 29). Why should you get to know Georgian wines? Because they're exciting. *Washington Post*. https://www.washingtonpost.com/lifestyle/food/why-should-you-get-to-know-georgian-wines-because-theyre-exciting/2015/08/29/ab1a313c-4c17-11e5-902f-39e9219e574b_story.html

Mercer, C. (2022, April 29). *Which countries drink the most wine? Ask Decanter*. Decanter. https://www.decanter.com/wine-news/which-countries-drink-the-most-wine-ask-decanter-456922/

Michalopoulos, S. (2019, February 19). *The future role of wine in society—From consumption to cultural heritage*. Events.Euractiv. https://events.euractiv.com/event/info/the-future-role-of-wine-in-society-from-consumption-to-cultural-heritage

Mills, D. A., Phister, T., Neeley, E., & Johannsen, E. (2008). Wine Fermentation. In L. Cocolin & D. Ercolini (Eds.), *Molecular Techniques in the Microbial Ecology of Fermented Foods* (pp. 162–192). Springer. https://doi.org/10.1007/978-0-387-74520-6_6

Mosiashvili, M. (2021, April 29). ქართული ღვინის ექსპორტი 2021 წლის პირველ კვარტალში 2%-ით გაიზარდა • Forbes Georgia. *Forbes Georgia*. https://forbes.ge/qarthuli-ghvinis-eqsporti-2021-tslis-pirvel-kvartalshi-2-ith-gaizarda/

Mtvralashvili, N. (2016, May 1). *გასულ წელს ქართული ღვინის ექსპორტი 39 პროცენტით შემცირდა*. bm.ge. https://bm.ge/ka/article/gasul-wels-qartuli-gvinis-eqsporti-39-procentit-shemcirda/793

Okrotsvaridze, lali. (2008). მევენახეობის განვითარების ეკონომიკური კანონზომიერებები და პერსპექტივები აგროსამრეწველო ინტეგრაციის პირობებში (კახეთის მხარის მაგალითზე): ეკონომიკა :: http://www.nplg.gov.ge/greenstone3/library/collection/ekonomik/document/HASH0197bc227a515419b9e3751d;jsessionid=DD3D15945CDF382E709A97983A28211E?ed=1

Oqropiridze, N. (2017, May 31). ქართული ღვინო მისი დაყენების ძველი და თანამედროვე ტექნოლოგიები. *AgroNews.ge*. https://agronews.ge/qarthuli-ghvino-misi-daqhenebis-dzveli-da-thanamedrove-teqnologiebi/

Pullman, M. (2018, January 8). *History of Georgian Wine*. Wild Frontiers. https://www.wildfrontierstravel.com/en_US/blog/the-fascinating-recent-history-of-georgian-wine

Ramishvili, M. (2022, December 21). საფერავი – ქართული ვაზის განსაკუთრებული ჯიში | აგროკავკასია. https://agrokavkaz.ge/dargebi/mevenakheoba/qarthuli-vazis-jishebis-mimokhilva-sapheravi.html

Ramishvili, M., & ketskhoveli, N. (2023, January 17). რქაწითელი – ქართული ვაზის ჯიშების მიმოხილვა | აგროკავკასია. https://agrokavkaz.ge/dargebi/mevenakheoba/qarthuli-vazis-jishebis-mimokhilva-rqatsitheli.html

Roberto, M. A. (2003). The Changing Structure Of The Global Wine Industry. *International Business & Economics Research Journal (IBER)*, *2*(9), Article 9. https://doi.org/10.19030/iber.v2i9.3835

Salome Deisadze, & Gelashvili, S. (2020, December 10). *To Subsidize or Not to Subsidize Georgia's Wine Sector?* https://iset-pi.ge/en/blog/80-to-subsidize-or-not-to-subsidize-georgia-s-wine-sector

S.M.C. Loureiro, N. C. (2017). *Wine Industry—An overview | ScienceDirect Topics*. Science Direct. https://www.sciencedirect.com/topics/social-sciences/wine-industry

Storchmann, K. (2012). Wine Economics*. *Journal of Wine Economics*, *7*(1), 1–33. https://doi.org/10.1017/jwe.2012.8

Sukhiashvili, V. (2022, May 9). *Government subsidizing harvest*. https://factcheck.ge/ka/story/41153-

%E1%83%9B%E1%83%97%E1%83%90%E1%83%95%E1%83%A0%E1%83%9D%E1%83%91%E1%83%90-%E1%83%A0%E1%83%97%E1%83%95%E1%83%94%E1%83%9A%E1%83%A1-%E1%83%AC%E1%83%94%E1%83%9A%E1%83%A1%E1%83%90%E1%83%AA-%E1%83%93%E1%83%90%E1%83%90%E1%83%A1%E1%83%A3%E1%83%91%E1%83%A1%E1%83%98%E1%83%93%E1%83%98%E1%83%A0%E1%83%94%E1%83%91%E1%83%A1

Surmava, M., Beroshvili, T., & Kvakhadze, I. (2022). *Georgian Wine Industry Overview*. 30.

Tabidze, D. (2022, October 2). რქაწითელი წითელი – წითელყურძნიანი საღვინე ვაზის ჯიში | აგროკავკასია. https://agrokavkaz.ge/dargebi/mevenakheoba/rkhacitheli-citheli-cithelqhurdzniani-saghvine-vazis-jishi.html

Tkeshelashvili, S. (2023, February 20). *რა გადის საქართველოდან ექსპორტზე? - TOP-10 პროდუქტი*. bm.ge. https://bm.ge/ka/article/ra-gadis-saqartvelodan-eqsportze---top-10-produqti/127381

Varadashvili, M. (2022, January 17). *ღვინის ექსპორტი: რა რაოდენობის ღვინო გაიყიდა საზღვრებს მიღმა 2021-ში?* bm.ge. https://bm.ge/ka/article/gvinis-eqsporti-ra-raodenobis-gvino-gaiyida-sazgvrebs-migma-2021-shi/99806