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**The Impact of SPSQ measures on the Trade Flow
between Georgia and CAREC Countries
(Azerbaijan, China, and Kazakhstan)**

Phatima Mamardashvili, Ia Katsia, Salome Deisadze, Daviti Zhorzholiani
ISET Policy Institute, Tbilisi, Georgia

February 2020

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Under the CAREC Think Tanks Network (CTTN), the CAREC Institute has launched the Research Grants Program in May 2019 to support scholars and researchers from members of the CTTN to produce targeted knowledge products which would add to the body of knowledge on regional cooperation in CAREC.

Scholars from member think tanks were encouraged to research CAREC integration topics and undertake comparative analysis between (sub) regions to draw lessons for promoting and deepening regional integration among CAREC member countries particularly as anticipated in the CAREC 2030 strategy and stated operational priorities.

The 2019 research grants have been awarded to five researchers who presented their preliminary findings during the August 2019 Think Tanks Forum in Xian, the PRC.

This paper presents the final draft on assessing impact of SPSQ measures on the trade flow between Georgia and CAREC Countries (Azerbaijan, China, and Kazakhstan) by the ISET Policy Institute of Georgia.

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Abstract

Since the Uruguay Round of the World Trade Organization (WTO), which introduced agriculture to the GATT (General Agreement on Tariffs and Trade) negotiation table, there has been increasing policy interest and academic debate on food safety regulations and their effect on the agri-food trade. During the Uruguay Round, WTO members negotiated the Sanitary and Phytosanitary Standards (SPSs) in the “SPS Agreement” and the Technical Barriers to Trade (TBT) agreements, which share common principles and rules with all member countries ([Mayeda, 2004](#)).

The foremost goal of this study is to analyze the potential impact of Georgia’s trade regulations and standards on the country’s agricultural trade with CAREC countries. The policy paper explored the impact of Georgia’s food safety, veterinary, and phytosanitary regulations and standards on the country’s agricultural trade with CAREC countries. The study revealed Georgia’s major CAREC trade partners, by the volume of exports and imports, to be Azerbaijan, Kazakhstan, and the People’s Republic of China. Based on the statistical analyses of 2014-18 years, this research has revealed the major export-import agricultural commodities between Georgia and the selected countries to be wine, live animals, and wheat. During the analyses, the study focused on these products and assessed the effect of the Sanitary Phytosanitary and Quality-related Standards (SPSQ) regulation on the trade of each respective product.

According to the research, at this stage, there are no limiting SPSQ regulations for wheat and live animals in Georgia. However, the upcoming regulation on wheat might tighten and improve the quality of imported wheat, and hinder unregulated trade. As for the export of live animals, only one restriction was introduced on the export of live animals under 140 kg in January 2019, otherwise, there are currently no additional SPSQ regulations which hinder animal trade.

For the wine trade, the study analyzed the effect of stricter regulations and standards on wine exports, as perceived by the exporters. The research defined four different indices, namely: quality standards; phytosanitary; labeling, marketing and packing requirements; and border quarantine measures. Subsequently, it revealed that Labeling, Marketing and Packing Requirements are the most problematic to deal with and the most restrictive for trade. One can thus argue that stringency is perceived, but has no significant effect on trade flows, however the study showed the negative effect of regulations on the wine trade, indicating a further need for trade development, strong assistance to wine exporters, and improved quality of the final product. Moreover, we also identified the need to target higher-income countries, as currently export is largely oriented towards lower-income countries and relatively cheap wines.

Introduction

Since the Uruguay Round of the World Trade Organization (WTO), which introduced agriculture to the GATT (General Agreement on Tariffs and Trade) negotiation table, there has been increasing policy interest and academic debate on food safety regulations and their effect on the agri-food trade. During the Uruguay Round, WTO members negotiated the Sanitary and Phytosanitary Standards (SPSs) in the “SPS Agreement” and the Technical Barriers to Trade (TBT) agreements, which share common principles and rules with all member countries ([Mayeda, 2004](#)). The SPS agreement is a collection of standards, guidelines, and codes of practice, and builds on the Codex Alimentarius, or “Food Code”, to ensure that food is safe and can be traded ([Joint FAO/WHO Codex Alimentarius Commission, 2007](#)). Food safety standards are perceived as non-tariff measures (NFM) as alternatives to tariffs, and they serve as a policy instrument that can affect trade flows ([Santeramo & Lamonaca, 2018](#)).

Many studies ([Santeramo & Lamonaca, 2018](#); [Shawn et al., 2015](#); [Atici, 2013](#); [Song & Chen, 2010](#); [Henson & Jaffee, 2006](#)) estimate the impact of food safety regulations on agricultural trade, and they often find controversial results. Some authors ([Kareem et al., 2015](#); [Shawn et al., 2015](#); [Song & Chen, 2010](#)) discuss “standards as barriers” and argue that food safety standards have an adverse effect on trade, as firms have to comply with regulations that increase their costs. Furthermore, the negative effects are more prominent in developing countries than in developed countries ([Keiichiro et al., 2015](#)). Whereas other studies ([Cardamone, 2011](#)) support the “standards as catalysts” view and claim that food safety regulations have positive effects on agri-food trade due to the demand-enhancing effect of standards. The meta-analysis of literature exploring the effects of non-tariff measures, including food safety regulations on agricultural trade, reveals that variability in trade effects may reflect distinctions within countries’ food safety regulations and standards, as well as levels of economic development ([Santeramo & Lamonaca, 2018](#)).

The foremost goal of this study is to analyze the potential impact of Georgia’s trade regulations and standards on the country’s agricultural trade with CAREC countries. The study determines the extent of harmonization, as perceived by exporters, with respect to the major SPSs and Quality (SPSQ) measures Georgia has implemented since signing the Association Agreement with the EU. The increased stringency on SPSQ standards might affect Georgia’s trade not only with the EU, but also with the CAREC region in the coming years. Therefore, study results will contribute to support regional integration and market connectivity within the CAREC region through providing better understanding of the impact of SPSQ measures on Georgia’s agricultural trade with CAREC countries.

The study employs a two-step methodology, based on [Melo et al. \(2013\)](#). The first step incorporates the construction of the multidimensional stringency index, derived from the four dimensions of SPSQ regulations and standards: 1) Quality-related technical regulations; 2) Phytosanitary; 3) Labeling, marketing, and packing requirements; and 4) Border-Quarantine Control. The second step includes the design of the Gravity model, using a multidimensional stringency index that comprises of the various dimensions of trade requirements. Based on the findings, the study provides the recommendations for reducing the possible negative effects of the regulations on Georgia’s agricultural trade flow and supporting regional integration between Georgia and other CAREC countries.

Methodology

In order to achieve the research objectives, the following activities were selected:

Identify Georgia's key CAREC trade partners and the respective major export-import commodities of those countries - Trade flows between Georgia and CAREC members were analyzed in order to identify Georgia's core trade partners; information on the trade flows between Georgia and CAREC countries is derived from international trade databases (COMTRADE, TRADEMAP, EUROSTAT, etc.). After revealing the main trade partners, based on trade statistics and expert interviews, the major export and import commodities were selected for further analyses.

An overview of the sanitary, phytosanitary, and quality-related standards in Georgia and the selected CAREC countries - After identifying the destination countries and respective products, via desk research and expert interviews, the study examined the existing trade agreements between Georgia and CAREC countries. The research also reviewed the relevant Georgian regulations and standards already in place, alongside other EU normative acts and Georgia's approximation plan (the Deep and Comprehensive Free Trade Area (DCFTA) Implementation National Action for 2018-2020) regarding the enactment of SPS measures. Particular attention was paid to the standards and regulations most likely to affect the three major export-import commodities, as previously identified by the examination. The study thus covered regulations within the following key areas: food safety, veterinary, and phytosanitary. The EU-Georgia agreement encompasses food safety standards, including food hygiene, labeling, and the maximum level of pesticides in food, alongside other general requirements regarding food.

An estimation of the effects of sanitary, phytosanitary, and quality-related standards on the trade flow between Georgia and the selected CAREC countries - NTMs are not easily quantifiable or modeled due to their idiosyncratic nature. In order to estimate the impact of additional regulations on trade from the selected CAREC countries, the study employed a methodology based on [Melo et al.](#) (2013) that includes the following steps:

1. Select experts from the relevant stakeholders to identify the main SPSQ and the standards affecting trade- We employed a "snowball" approach in selecting the relevant respondents to identify the main SPSQ regulations and standards that affect trade;
2. Measure export firms' perceptions of stringency- We developed a simple, closed-ended questionnaire, and applied it to the corresponding export firms, key experts, and associations to measure their perceptions of the stringency of the selected regulations and standards in Georgia and the CAREC countries (Annex 1). The stringency perception scale measures from 0 to 7, where 0 represents a lack of stringency and 7 represents a very high level of stringency;
3. Calculate the stringency index- Based on the key stakeholders' interviews, we calculated the aggregate stringency index as a simple average of the scores assigned by each respondent to the regulation or standard n of destination country i . The study also estimated the disaggregated indices by different regulation dimensions; the indices varied by year and market, based on the assessments and predictions attained from evolutions declared by the exporters.

4. Employ a Gravity Model approach – The gravity model is a tool for modeling bilateral trade flows based on a trade partner’s economic size and the distance between the two. The model is valuable for analyzing the determinants (for instance, common borders, currencies, languages, or similar legal systems, etc.) of trade flows and assessing the effectiveness of trade agreements and alliances. This paper employed the classical gravity model proposed by [Jan Tinbergen](#) (1962):

$$T_{A,B} \propto \frac{(GDP_A)^\alpha (GDP_B)^\beta}{(Dist_{AB})^\zeta}$$

With $\alpha, \beta, \zeta \approx 1$. To analyze the effect that stricter regulations and standards on Georgia’s wine export, as perceived by experts, we estimated the gravity model using a disaggregated stringency index of different regulation dimensions.

Georgia’s Agricultural Trade with CAREC countries: An Overview

CIS countries and CAREC countries presently represent Georgia’s major trade partners in agricultural products with more than half of country’s agriculture exports going there and a relatively small proportion, c.20%, of Georgia’s agricultural exports are directed to EU countries, and the same is largely true of imports. In recent years, Azerbaijan, Kazakhstan, and China have been Georgia’s three main agri-food trade partners within the CAREC region.

In 2018, the export value of agri-food products to Azerbaijan accounted for more than 49 million USD - more than the combined exports to Kazakhstan and China in the same year. The most important product group of Georgia’s exports with these countries were beverages, spirits, and vinegar (HS code 22), with a corresponding export value exceeding 56 mln. USD in 2018. The next significant product group, the exports of live animals (HS code 01), increased by 5 mln. USD in 2018 compared to 2017 and reached almost 17 mln. USD in 2018, with Azerbaijan being its chief destination country. Live animal export, which, although it has been increasing, shrank fifteen-fold between 2013 and 2016, whereas the export of tobacco, and manufactured tobacco substitutes (HS code 24), the third most important product group, was barely in place prior to 2015, nevertheless it skyrocketed to 38 mln. USD in 2017.

The remaining major agricultural product exports of: fish and crustaceans, mollusks and other aquatic invertebrates (HS code 02); edible vegetables, and certain roots and tubers (HS code 07); and food industry residue and waste, prepared into animal fodder (HS code 23), have each been leading in recent years. Although, fish and crustaceans, mollusks and other aquatic invertebrates completely lost the Kazakhstani market in 2018, while edible vegetables, and roots and tubers were going strong in Azerbaijan, and food industry animal fodder gained popularity on the Chinese market.

From the import side, Georgian agricultural product imports were more evenly divided between Azerbaijan, Kazakhstan, and China, and less concentrated on one type of product, as with exports. The total import of agricultural products from these three countries was below 70 mln. USD last year, and approximately 47% originated from Azerbaijan.

Cereals (HS code 10) led the imports (21 mln. USD) of the three core trading partners in 2018, while the second largest import group (8 mln. USD) was edible vegetables, and roots and tubers (HS code 07). The latter, combined with export data, suggests that Georgia and its partners produce and sell vegetables of different qualities and characteristics, and make active exchanges to better serve domestic market needs. A similar logic also applies to fish and crustacean, mollusc and other aquatic invertebrate (HS code 02) trade, which reached fourth place, with a value exceeding 6.5 mln. USD; while the third most important import group, animal and vegetable fats and oils, and their edible byproducts (HS code 15), totaled more than 7.5 mln. USD in imports over the past year.

Considering country specific imports, Georgia spent over 20 mln. USD on purchasing cereals from Kazakhstan in 2018, rebounding to their pre-2015 trading figures, after having virtually disappeared between 2015 and 2017. As for edible vegetables, and certain roots and tubers, 93% were imported from Azerbaijan, while the remaining 7% were provided by China. While Azerbaijan was the core trading partner in providing animal and vegetable fats and oils, and their edible byproducts to the Georgian market in 2018, and China played the same role for fish and crustaceans, mollusks and other aquatic invertebrates.

Wine is one of Georgia's most significant export commodities, accounting for 21% of total agricultural exports (Geostat, 2019). Alongside established export destinations, China is becoming an increasingly important market for Georgian wines. In 2010, less than half a percent of the total wine exports were designated for the Chinese market, however in 2017 Georgian wine generated almost 10% of the total export revenue for their market. Unlike China, Kazakhstan has been gradually losing its significance as an export destination for Georgian wine since 2012: in 2010 19% of Georgia's exported wine were directed to Kazakhstan, while the same indicator was 5% in 2018. Meanwhile, the quantity of exported wine was increasing steadily in absolute terms until 2014 (16 mln. USD). Thereafter, exports started to decline in absolute terms too and they were down to 9 mln. USD in 2018. This can be explained by the fact that Russia ended the embargo on Georgian export in 2013 and in result, wine producers started to export their wine to Russian markets. Whereas, Azerbaijan has always been a less notable trade partner for Georgian wine; the record year being 2011, when wine export value exceeded the 2 mln. USD benchmark.

An Overview of Sanitary, Phytosanitary, and Quality-related Standards in Georgia and Selected CAREC countries

The EU-Georgia Association Agreement was signed on 27 June 2014, including the Deep and Comprehensive Free Trade Area (DCFTA). The most important aspects of which, from a trade perspective, are the Sanitary and Phytosanitary (SPS) measures, and the food safety standards and technical regulations that are required for access to European markets. Export to the EU is still rather limited, and the main causes for this deficiency, amongst others, are the regulations and standards with which Georgia must comply. The DCFTA is also different from other Free Trade Agreements and implies regulatory approximations, not only for exports, but equally domestically. Thus, the DCFTA will have consequences on Georgia's trade with both the EU and with other countries, including the CAREC region.

Through the efforts of the Georgian government, and the active participation of private stakeholders and civil society organizations, numerous regulations have been implemented to approximate a legislative basis for EU food safety regulations and standards, however many more are still to be implemented before 2030 (NFA, 2019).¹

As part of DCFTA obligations, Georgia has to ensure a high level of food safety and animal and plant health within the country, and harmonize its food safety legislative basis to EU standards. The EU food safety policy is concentrated on four main areas: food hygiene, animal health, plant health, and contaminants and residues (EU, 2019). Food safety regulations moreover cover multiple dimensions of veterinary and phytosanitary programs, and control food products from EU countries, as well as imported products. The EU-Georgia agreement encompasses food safety standards, including food hygiene, labeling, and the maximum levels of pesticides in food, alongside other general requirements regarding food. Veterinary standards cover animal identification and registration, food hygiene, and the control, monitoring, and diagnoses of animal diseases. While phytosanitary regulations include plant protection, as well as the sustainable use of pesticides, the regulation of food packaging, and other necessary obligations to be completed by exporters and importers.

SPS measures have yet to be considered a priority in the national development strategies of most CAREC countries, and they remain at a nascent stage in trade facilitation initiatives (ADB, 2019). Outdated legislation, poor laboratory capacity, and a lack of coordination among border controls have remained the main challenges to fostering greater agricultural food trade in the region.^{2 3}

As previously noted, Georgia has gradually developed its national regulatory system to be in line with European Union standards, under the DCFTA agreement, indicating that its SPS-related legislation is more closely aligned with the WTO SPS agreement than any other CAREC country.

The People's Republic of China (PRC) has adopted relatively advanced SPS principles and standards. Before commercialization or departure from the PRC, all imports and exports are

¹ A detailed implementation schedule is presented in Annex 1, Table 1.

² For example, Pakistan Pure Food Law was enforced in 1963, Uzbekistan's Food Safety Law – in 1997

³ Inspection posts are built on different Border Crossing Points on different side of the border, opening hours are not synchronized, and responsibilities of the officers are not harmonized.

listed and subject to statutory inspection by the entry and exit inspection and quarantine authorities. The PRC has also implemented an e-certification system ([ADB, 2019](#)).

Despite Kazakhstan having formally included the SPS agreement principles into their national legislation, the country’s SPS requirements and practices do not comply with international SPS standards ([ADB, 2019](#)). Kazakhstan is, however, a member of the Eurasian Economic Union (EAEU) and therefore its SPS legislation and measures are now consistent with EAEU legislation.

From these selected countries, only Azerbaijan is not a member of the WTO, indicating that its legislation is not aligned with the barest minimum standards recognized by the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement). Nonetheless, Azerbaijan complies with the international standards prescribed by the International Plant Protection Convention (IPPC), the World Organization for Animal Health (OIE), and the Codex Alimentarius (Table 1).

Table 1: Membership in the WTO and International Organizations or Conventions

	WTO	IPPC	OIE	Codex
Georgia	Yes (2000)	Yes	Yes	Yes
Azerbaijan	Observer	Yes	Yes	Yes
The People’s Republic of China	Yes (2001)	Yes	Yes	Yes
Kazakhstan	Yes (2015)	Yes	Yes	Yes

Source: [ADB, 2019](#)

Amongst the selected CAREC countries, Georgia has the most recent legislation on the safety of foodstuffs and animal feed, veterinary services, and plant protection, adopted in 2014. The law covers both plant protection and veterinary-related legislation. While the Chinese law on “the Entry and Exit Animal and Plant Quarantine” also includes plant protection, phytosanitary and veterinary-related legislations, whereas Azerbaijan and Kazakhstan have separate legislation to control plant and animal health.⁴

Food safety laws vary considerably in the selected countries. In Georgia, there is a risk-based approach to food safety, which includes mandatory hazard analysis and critical control points (HACCP). The Law of the Republic of Azerbaijan on Foodstuffs, amended in 2018, does not directly make reference to HACCP or a HACCP-like system for process control, but follows the farm-to-fork approach and requires registration of entities and individuals during every stage of the food supply chain. In addition, certification is mandatory for imported food products. As for the PRC, food safety principles are not directly referenced in the Food Safety Law; HACCP is not required under this law, unless an entity plans to export food. Akin to China, Kazakhstan’s Law on the Safety of Foodstuffs does not make a reference to the mandatory application of HACCP, although it indicates that exported food products must comply with the requirements of the importing country.

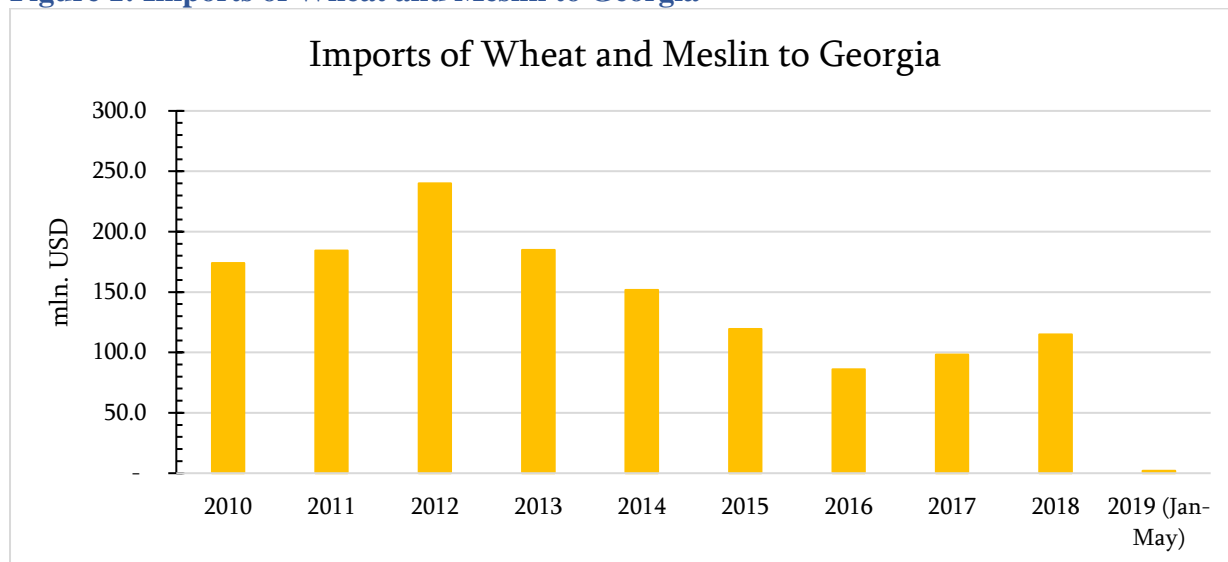
⁴ The more specific institutional frameworks regarding plant protection and phytosanitary and veterinary-related legislation are presented in Annex 1.

Summary of the Main Findings

Based on a statistical analysis of the past five years, the most apposite agricultural commodities were selected for the purpose of study, namely: wheat, live animals, and wine. Wine and live animals are the top export products to the selected countries, and they represent a significant source of income for Georgia. While wheat is one of the most imported products from CAREC countries. Georgia imports over 80% of its wheat (Geostat, 2019), and the wheat price is ever determined by the exporting countries and international prices. Moreover, wheat and its byproducts are a main staple food in both rural and urban areas; in total, the share of wheat products in the dietary energy supply amounted to 41% in 2005-2007 (Katsia et al., 2016).

The wheat and meslin group are among the most significant in terms of Georgia's international agricultural trade. In 2018, the country spent almost 115 mln. USD purchasing wheat and meslin from its trading partners. Russia has been the principal supplier in recent years and practically the sole importer of wheat and meslin to Georgia between 2015 and 2017; when imports from Kazakhstan were almost nullified. It is noteworthy that in 2012 more than half (125 mln. USD) of Georgia's wheat and meslin imports originated from Kazakhstan, yet these imports declined in relative and in absolute terms until 2018, when they again started to grow and reached 18 mln. USD (16% of total annual imports). Whereas, Azerbaijan provided only a marginal contribution of wheat and meslin to its western neighbor, and similarly none of the named cereals have been imported from China to Georgia in the last decade. The total imports of wheat and meslin to Georgia for the last ten years are presented in Figure 1:

Figure 1: Imports of Wheat and Meslin to Georgia



Source: Geostat, 2019

In recent years, the decreasing import quantities from Kazakhstan coincides with the lower price of Russian wheat. Equally, transportation costs from Kazakhstan are higher than from Russia, as the cargo moving from Kazakhstan covers 35-40% more distance and has to pass at least one more country to enter Georgia, while Russia is a Georgia's immediate neighbor. In 2007 Kazakhstan was planning to invest 10 million USD in the construction of a storage and processing terminal in Georgia's Black Sea port of Poti. The idea was to focus on increasing the competitiveness of the transit route via Azerbaijan and Georgia. That year,

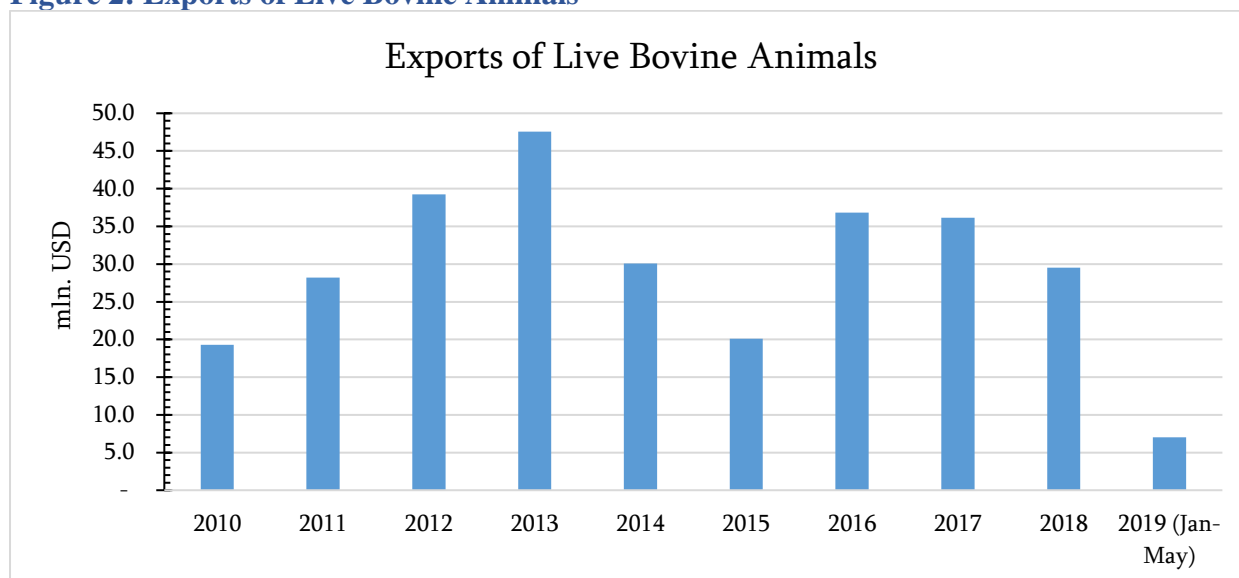
Kazakhstan was the third largest foreign direct investor in Georgia, at 152 mln. USD. However, they ceased plans to build the grain terminal due to the unstable political situation (the 2008 Russo-Georgian August war).

Negotiations with Kazakhstani wheat stakeholders and the Georgian government have since been renewed, and it is expected that Georgian wheat import from Kazakhstan will consequently increase.

As for wheat regulations, the [Rule of Implementation of Phytosanitary and Veterinary Border-Quarantine Control](#) was implemented in 2010. According to stakeholders, there are no other restrictive norms in Georgian legislation that may hinder trade from Kazakhstan or Russia. There is also no technical regulation on wheat in place in Georgia to set the standards for imported wheat quality or for transportation conditions. This absence of regulations thus encourages importers to import low quality wheat. While according to the wheat producers, the quality of imported wheat is not uniformly monitored on all transport. The documentation that ensures the safety and quality of the wheat is requested when wheat is imported by ship or rail, however, for transportation by motor vehicles, no documentation is required. Nevertheless, Georgian wheat producers have initiated the implementation of the [Technical Regulations on Wheat](#). This regulation will control the quality of both imported and locally produced wheat.

A further selected commodity is live bovine animals, from the important live animal sub-category within Georgia's export list. Although its value has yet to break its 2013 height (48 mln. USD), these goods have maintained a reasonable share of agricultural products export and reached almost 30 mln. USD last year. Azerbaijan was once the top destination for Georgia's live bovine animals exports, nearly all exports from 2012-2014 were sent from Georgia to its eastern neighbor, though thereafter the Iraqi market emerged, and became the greatest export destination in 2016 and 2017 (84% and 73% of annual exports, respectively). Yet in 2018, Azerbaijan and Iraq split the market of live bovine animals, with 15 mln. USD of animals sent to the prior market, and 14 mln. USD worth to the latter, and almost no exports were sent elsewhere. Georgia's exports of live bovine animals for the last decade are depicted in Figure 2:

Figure 2: Exports of Live Bovine Animals

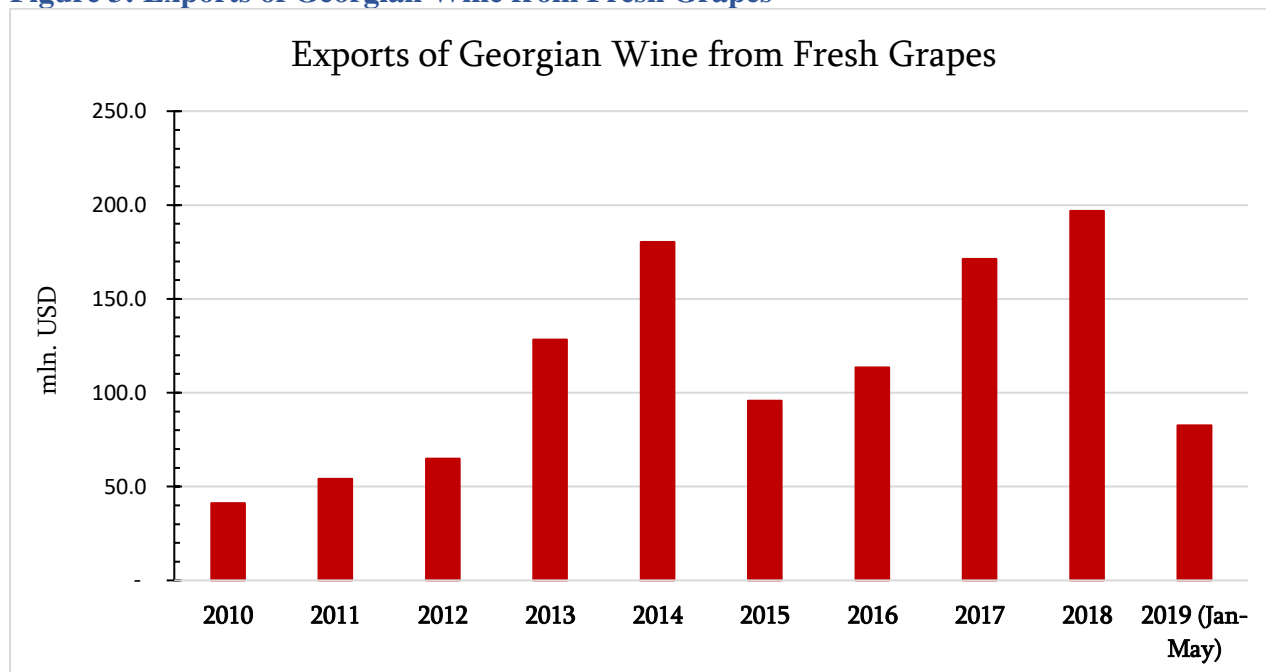


Source: Geostat, 2019

Meat production in Georgia is controlled by a technical regulation which defines veterinary and sanitary rules, there is also a technical regulation on the rules for labeling meat and meat products. However, none of these regulations apply to live animals. Via the interviews with relevant stakeholders and a desk review, it was highlighted that there are no SPS regulations which may hinder the export of live animals. Exporters stated that their product needs only to comply with a destination country’s regulatory framework. Thus, export commodities need satisfy the specific requirements and standards, if any, as requested by a buyer. A buyer sends a requirement list in advance, and the exporter must meet the client’s requirements. The interviews also revealed that buyers from Azerbaijan do not have any restrictive requirements that hinder trade; exported live animal easily satisfy the requirements of the Azerbaijani regulatory framework. However, it should be noted that since January 2019, the export of live animals of less than 140 kg is prohibited. This regulation aims to develop the sector and to create long-term stability.

The third product identified for analyses was wine, this is unsurprising as wine is typically a key export commodity, accounting for 21% of Georgia’s total agricultural exports (Geostat, 2019). Wine from fresh grapes is a leading export product within the beverages, spirits, and vinegar group (HS code 2204), constituting over 5% of the country’s total export value. Excluding 2014, the export of this agricultural product has been increasing steadily over the last decade, and 2018 marked a record year with exports reaching a value of almost 200 mln. USD. Nevertheless, the wine export market is still quite concentrated, and in recent years, Russia accounted for roughly half of the total export (58% in 2018), with Ukraine as the second largest export destination, accounting for one tenth (11% in 2018) of export value.

Figure 3: Exports of Georgian Wine from Fresh Grapes



Source: Geostat, 2019

To address the effect SPSQ regulations and standards have had on the export of wine, we employ a theoretically motivated gravity model that incorporates a multidimensional stringency index. For the study purposes, we conducted interviews with wine producers and experts. During the interviews, the respondents assessed the stringency of different measures

on Georgia's wine export from 0 to 7, where 0 represents a lack of stringency and 7 represents a very high level of stringency. Table 2 summarizes the results from the interviews and presents disaggregated stringency indices for 1) Quality-related technical regulations; 2) Phytosanitary; 3) Labeling, marketing, and packing requirements; and 4) Border-Quarantine Control.

Table 2: Disaggregated Indices for SPS and Quality-related Measures

Year	Quality Standards ⁵	Phytosanitary	Labeling, Marketing and Packing Requirements	Border Quarantine Measures
2018	6.50	6.30	6.60	6.50
2017	6.40	6.10	6.30	6.40
2016	5.60	5.90	5.60	6.00
2015	5.30	5.60	5.30	5.70
2014	4.70	5.20	4.90	5.60

The perceived stringency has either increased for all four SPSQ-related regulations in the wine trade, which may be due to the effect of the newly introduced, more restrictive, regulations connected to Georgia's commitments to the DCFTA. Although Georgian exporters consider all four regulations quite restrictive (the average perceived stringency equaled 5.10 in 2014 and 6.48 in 2018), the Labeling, Marketing and Packing Requirements appear most problematic to deal with.

Subsequently, we employed a theoretically motivated gravity model using various economic factors and the previously calculated aggregated stringency index ($SINDEX_{it}$). The specification of our model is derived from that utilized by Melo, Engler, Nahuehual, and Cofre (2013) to evaluate the SPSQ standards and regulations effects on Chile's international fruit trade. The original model, adjusted for Georgia, uses the following form:

$$\ln X_{itk} = \delta_0 + \delta_1 * \ln DIST_i + \delta_2 * SINDEXT_t + \delta_3 * DEV_{it} + \delta_4 * TREND_i + v_{itk},$$

Where: $X_{itk} = \frac{IMP_{itk}}{CONS_{itk}} / \frac{PROD_{itk}}{WPROD_{itk}}$ i denotes the partner county; k denotes a product (wine); and t denotes the year; IMP_{itk} is imports in physical volume; $CONS_{itk}$ is apparent consumption in physical volume; $PROD_{itk}$ is production of the product (wine) by a trading partner; and $WPROD_{itk}$ is the world total production, taking into account the year, the product (wine), and the trading partner.

From the model utilized by Melo et al. (2013) we excluded certain variables: common language ($LANG_i$) and tariff-free ($TARIFF_i$), because neither Georgia, Azerbaijan, Kazakhstan, nor China share a common language ($LANG_i$), and each of these four countries enjoys tariff-free ($TARIFF_i$) trade. While, the variable $DAYS_i$, which takes into account the shipping time between Chile and importing ports, was substituted with $DIST_i$, the distance

⁵ The wine bottle, laboratory analyses of the sample, blind degustation, and evaluation of the wine.

between the Georgian capital city, Tbilisi, and the capital city of the respective trading partner. The substitution was due to Azerbaijan sharing a land-border with Georgia, Kazakhstan being a landlocked country, and the Silk Road connection from China. $TREND_i$ is a linear time trend, while the $FRUIT_k$ variable has been eliminated as it was necessary to analyze the total wine trade only and not the breakdown of wine varieties. The DEV_{it} variable is binary with a value of 1 (higher income) for China and Kazakhstan and 0 (lower income) for Azerbaijan, to represent their levels of income by GDP per capita. While $SINDEX_t$ is the averaged perceived stringency of the four wine-related SPSQ standards and regulations in a given year.

The results of the model are summarized in the table below:

Table 3: Estimated Results of the Gravity Model

Variable	Estimated Coefficient	Robust Standard Error	P-Value
lnDIST	-2.80***	0.18	0.000
SINDEX	-0.51	8.10	0.950
DEV	-1.94***	0.53	0.000
TREND	0.04	3.11	0.989
Constant	-62.36	6229.66	0.992

The signs of the coefficients are as expected, alongside the following interpretation:

- The standard gravity model variable distance is significant. The further the trading partner from Georgia, less wine is exported from Georgia, and the effect is statistically significant at any conventional level for significance;
- The higher the average perceived stringency of the SPSQ standards/regulations, the fewer wine exports occur in a particular year. Although the effects are insignificant, the sign is as expected. Stringency has a negative effect on wine trade;
- Georgia's wine exports are lower in high-income countries, indicating that, currently, the county sells relatively cheap wine, and targets low-income consumers. The effects are statistically significant even at the 1% level of significance, which indicates the need for notable promotion in valuable markets;
- The trend, although positive, has no statistical significance at all.

Conclusions

There is increasing policy interest and academic debate on food safety regulations and their effect on the agri-food trade. Many studies ([Santeramo & Lamonaca, 2018](#); [Shawn et al., 2015](#); [Atici, 2013](#); [Song & Chen, 2010](#); Henson & Jaffee, 2006) are devoted to exploring the impact of food safety regulations on agricultural trade. Some authors ([Kareem et al., 2015](#); [Shawn et al., 2015](#); [Song & Chen, 2010](#)) claim that food safety standards serve as trade barriers; having negative effects on trade, as firms have to comply with regulations that increase their costs. [Keiichiro et al. \(2015\)](#) argue that the adverse effects are more prominent in developing countries than in developed countries. Other studies ([Cardamone, 2011](#)) perceive “standards as catalysts” and argue that food safety regulations and standards enhance demand and, therefore, have positive effects on agricultural trade. Moreover, the meta-analysis of literature exploring the effects of food safety regulations on agri-food trade highlights that these effects differ by countries and by their levels of economic development ([Santeramo & Lamonaca, 2018](#)).

This policy paper explored the impact of Georgia’s food safety, veterinary, and phytosanitary regulations and standards on the country’s agricultural trade with CAREC countries. The study revealed Georgia’s chief CAREC trade partners, by the volume of exports and imports, to be Azerbaijan, Kazakhstan, and the People’s Republic of China.

Based on the statistical analyses of the last five years, this research has revealed the major export-import agricultural commodities between Georgia and the selected countries to be wine, live animals, and wheat. During the analyses, the study focused on these products and assessed the effect of the SPSQ regulation on the trade of each respective product. According to the literature and the results from interviews, one can conclude that, at this stage, for wheat and live animals there are no limiting SPSQ regulations. However, the upcoming regulation on wheat might tighten and improve the control of imported wheat, and hinder unregulated trade. As for the export of live animals, there are no restrictive regulations in place. Although, since January 2019, a new regulation in place prohibiting the export of live animals of less than 140 kg. There are currently no additional SPSQ regulations which hinder animal trade.

For the wine trade, the study analyzed the effect of stricter regulations and standards on wine exports, as perceived by the exporters. The research defined four different indices, namely: quality standards; phytosanitary; labeling, marketing and packing requirements; and border quarantine measures. Subsequently, it revealed that Labeling, Marketing and Packing Requirements are the most problematic to deal with and the most restrictive for trade. One can thus argue that stringency is perceived, but has no significant effect on trade flows, however the study showed the negative effect of regulations on the wine trade, indicating a further need for trade development, strong assistance to wine exporters, and improved quality of the final product. Moreover, we also identified the need to target higher-income counties, as currently export is largely oriented towards lower-income counties and relatively cheap wines.

As part of its obligations under the AA with the EU (including the DCFTA), Georgia has to ensure a high-level of food safety and animal and plant health within the country, and to harmonize its food safety legislative basis with EU standards. Increasing stringency on SPSQ standards will therefore have consequences not only on Georgia’s trade with the EU, but also with the CAREC region in the following years.

In order to reduce the possible negative effects of the regulations on Georgia's agricultural trade flow with CAREC countries, government agencies and sectoral associations should:

- Invest in facilities to harmonize SPSQ measures within CAREC region and at the borders;
- Tailor their policies to develop their capacities to comply with the collective requirements;
- Engage in regional and international cooperation and policy dialogue;
- Develop and enhance technical skills of the personnel engaged in SPSQ related areas;

To improve market connectivity and agricultural value Chain linkages within the CAREC regions, the interaction between private sector and public sector should be increased. CAREC countries should bring the regional agenda down to local issues and establish Public-Private Partnerships (PPPs) for regional integration initiatives to bring greater predictability and institutional stability within the CAREC region.

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Annex

Table A1: Plant Protection and Phytosanitary and Veterinary-related Legislation in Selected Countries

Plant Protection and Phytosanitary Legislation				
Country	Most Recent Plant Health Instrument	Year of Publication (Latest Amendment)	Integrated Plant Health and Internal Plant Protection	Other Legislation
Georgia	Law 6155-Ic. Code on Safety of Foodstuffs and Animal Feed, Veterinary Services and Plant Protection	2014 (2017)	Yes	Law on Pesticides and Agrochemicals (1998), updated in 2017
Azerbaijan	Law on Phytosanitary Control No. 102-IIIG (Pesticides included)	2006 (2018)	Yes	The Rules on Phytosanitary Quarantine, adopted in May 2018
The People's Republic of China	National People's Congress. Order No. 53. Law of the People's Republic of China on the Entry and Exit Animal and Plant Quarantine	2012 (2016)	No	N/A
Kazakhstan	Law on Plant Quarantine (EAEU Technical Regulations apply)	1999 (2017)	Yes	Rules on Protection of the Territory of the Republic of Kazakhstan from Quarantine Objects and Alien Species (2009; updated in 2015)
Veterinary-Related Legislation				
	Most Recent Veterinary Instrument	Year of Publication (Latest Amendment)		
Georgia	Law 6155-Ic. Code on Safety of Foodstuffs and Animal Feed, Veterinary Services, and Plant Protection	2014 (2017)		
Azerbaijan	Veterinary Act 922-IIQ	2005 (2014)		
The People's Republic of China	National People's Congress. Order No. 53. Law of the People's Republic of China on the Entry and Exit Animal and Plant Quarantine	2012 (2016)		
Kazakhstan	Law on Veterinary	2002 (2018)		

Source: [ADB](#), 2019

Table A2: The EU Food Safety Regulations and Standards Implementation Schedule in Georgia

Policy Area	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Food safety	16	13	9	6	7	9	7	7	8	7	4	9	-
Veterinary	10	9	7	9	7	7	5	9	3	5	4	6	3
Phytosanitary	4	3	3	9	8	10	4	10	12	7	7	8	-
Total	30	25	19	24	22	26	16	26	23	19	15	23	3

Source: Europe Foundation, 2017

Table A3: List of Interviews

Organization	Date
Wheat producer's association	12.06.2019
Ministry of Environmental Protection and Agriculture of Georgia – National Food Agency	18.06.2019
National Wine Agency	28.06.2019
Wine Company- Kakhetian Traditional Winemaking	2.07.2019
Food Safety Expert	03.07.2019
Wine Company- Teliani Valley	3.07.2019
Ministry of Environmental Protection and Agriculture of Georgia - Viticulture and Winemaking Analysis and Regulatory Department	09.07.2019
Wine Company- GWS	10.02.2019
Wheat Importer-Agricomi	10.07.2019
Wine Company - Badagoni	10.07.2019
Wine Company - Mildiani	10.07.2019
Wine Company- Mukhrani	11.07.2019
Wine Company- Schuchmann Wines Georgia	28.07.2019
Wine Company- Telavi Wine Cellar	22.07.2019
Wine Company-Tbilvino	22.07.2019