Food and Agriculture Organization of the United Nations

Agricultural policy monitoring for eight countries in Eastern Europe, Caucasus and Central Asia

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Rome, 2022

Required citation:
FAO. 2022. *Agricultural policy monitoring for eight countries in Eastern Europe, Caucasus and Central Asia.* Rome
https://doi.org/10.4060/cc2637en

ISBN 978-92-5-137084-1

Preparation of this document

In support of FAO, the Agricultural Institute of Slovenia (AIS) coordinated the data collection and carried out the calculations of the indicators. A country expert was assigned for each country to assist with the data collection process and provide background information on markets and policies to help interpret the indicators. FAO provided methodological support to the AIS team and the country experts. Focal points nominated by the governments of the eight countries provided additional support for the data collection and interpretation efforts and peer-reviewed country results and various drafts of the report.

A methodology workshop with the country experts was held in Tbilisi, Georgia on 5–6 March 2018. The first preliminary results were presented at a scientific conference organized by the Leibniz Institute of Agricultural Development in Transition Economies (IAMO) and the Institute of Scientific Research on Economic Reforms (ISRER) in Baku, Azerbaijan on 6–7 September 2018. A review session with the government focal points and other experts from the region was conducted at the fourth annual meeting of the Agricultural Trade Expert Network in Europe and Central Asia in Odessa, Ukraine on 11–13 September 2018. The results of the first round of indicator calculations were presented to, and peer-reviewed by, government officials from the eight countries at a final workshop held in Minsk, Belarus on 2–3 October 2019. At the workshop, participating officials indicated the strong interest of their respective governments in the continuation of quantitative policy monitoring in support of evidence-based decision-making processes at the country level. The results of the subsequent[1] indicator estimates in 2020 were presented and validated by country experts and government focal points at a workshop held virtually in October 2020.

This report is organized as follows. Chapter 1 provides a brief overview of key developments in agricultural trade in the eight countries and agricultural and trade policies in the region. Chapter 2 describes the data requirements and the methodological approach used to calculate the policy indicators. Chapter 3 presents the key results at the regional level, while Chapter 4 examines the detailed study results by country.

[1] *Tajikistan and Uzbekistan presented their first round of indicators, as they entered the study at a later point than the other countries.*

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Foreword

Agricultural and trade policies affect prices and trade flows at the national and international levels. The 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) recognize the importance of such policies in achieving food security. For instance, Target 2.b of SDG 2 commits countries to "correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round". This target can only be pursued effectively if the appropriate evidence base, in terms of data and analysis of the magnitude and effects of these distortions, is established.

Since 2014, the Markets and Trade Division of the Food and Agriculture Organization of the United Nations (FAO) has monitored and documented changes in agricultural and trade policies in Eastern Europe, Caucasus and Central Asia (EECCA) countries through an annual Review of Agricultural Trade Policies in 12 EECCA countries. FAO has also established and is supporting the Agricultural Trade Expert Network (ATEN) in Europe and Central Asia. This network of experts conducts research, carries out training programmes and advises governments and the private sector on issues related to agricultural trade and trade policy.

In 2018, under the umbrella of FAO's strategic objective on enabling inclusive and efficient agricultural and food systems and to contribute to FAO's Regional Initiative on Improving Agrifood Trade and Market Integration in Eastern Europe and Central Asia,[1] the Markets and Trade Division conducted a pilot study to measure agricultural distortions in six EECCA countries. In this exercise, Armenia, Azerbaijan, Belarus, Georgia, Kyrgyzstan and the Republic of Moldova were selected as pilot case study countries, given that they had undergone fundamental policy changes during the last two decades and did not have systematic and continuous policy monitoring in the past.

Responding to the high demand expressed by governments for the continuation of such quantitative policy monitoring in support of evidence-based decision-making, an update, expansion and revision of this study was conducted in 2020, covering additional key commodities and two more countries, namely Tajikistan and Uzbekistan. For these two new countries, the exercise was one of the first such comprehensive monitoring efforts to quantify agricultural incentives, and an important part of the work was dedicated to testing the feasibility of the methodology and to exploring the availability of data required for conducting the analysis.

The main objective of this study is therefore to review the agricultural policy environment and provide quantitative indicators for policy incentives and disincentives to farmers for key commodity value chains in the eight study countries, utilizing the methodology aligned with the approach of the International Organisations Consortium for Measuring the Policy Environment for Agriculture (Ag-Incentives Consortium). This report describes the methodology and approach taken for the eight countries covered by this study and presents the key results and their interpretation in the policy and market contexts of the countries and the region.

[1] *Since 2021, this regional initiative has been renamed "Transforming food systems and facilitating market access and integration".*

Acknowledgements

The report is a product of the Markets and Trade Division (EST) of FAO. The research and preparation of the report was led by Iryna Kobuta, Economist, EST, FAO. The research and writing team included Sara Bele (AIS), Emil Erjavec (University of Ljubljana), Iryna Kobuta (FAO), Maja Kožar (AIS), Ekaterina Krivonos (FAO), Luka Ložar (AIS), Signe Nelgen (FAO), Tanja Travnikar (AIS) and Andrea Zimmermann (FAO).

The data and information for the study countries were collected and validated by the country experts: Vasilina Akhramovich (Belarus, country expert), Zalina Enikeeva and Roman Mogilevskii (Kyrgyzstan, University of Central Asia), Ketevan Gachechiladze and Natali Kldiashvili (Georgia, Fund Georgian Center for Agribusiness Development [GCAD]), Vardan Urutyan (Armenian National Agrarian University) and Hasmik Hovhanesian (Yerevan State University), Rashad Huseynov (Azerbaijan, The Khazar University), Darya Ilina (Uzbekistan, country expert), Parviz Khakimov (Tajikistan, country expert), Eugenia Lucasenco (the Republic of Moldova, National Institute for Economic Research). The results for each country were validated by the respective country representatives.

Signe Nelgen, FAO Consultant, significantly contributed to the report, including to the underlying data coordination and analysis.

The research team is grateful to Valentina Pernechele, Economist at the FAO Agrifood Economics Division, ESA, for the technical review, valuable comments and the methodological guidance provided.

The research also benefited from contributions by Josef Schmidhuber, Deputy Director, and Georgios Mermigkas, Senior Economist, EST, FAO, through their review of an earlier version of the report.

The authors thank Evelyne van Heck, Trade Specialist at EST, FAO, for her overall review of the report. They are also grateful to Jonathan Hallo and Ettore Vecchione for the report design, and to Araceli Cardenas for production support.

Finally, the authors thank Boubaker Ben-Belhassen, Director of EST, FAO, for his overall guidance and support.

Acronyms, abbreviations and symbols

AIS	Agricultural Institute of Slovenia
ATEN	Agricultural Trade Expert Network in Europe and Central Asia
BOT	commodity-specific public expenditure, measured as monetary units per quantity unit
CCT	Common Customs Tariff
CEPA	Comprehensive and Enhanced Partnership Agreement
CIF	cost, insurance and freight price of trade (imported commodity)
CIS	Commonwealth of Independent States
CSE	Consumer Support Estimate
CSE BOT	Budgetary transfers to consumers
DCFTA	Deep and Comprehensive Free Trade Area
EAEU	Eurasian Economic Union
EECCA	Eastern Europe, Caucasus and Central Asia
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FOB	free on board price of trade (exported commodity)
FTA	Free Trade Area
GDP	Gross domestic product
GSP	Generalized Scheme of Preferences
GSSE	General Services Support Estimate
GSSE BOT	budgetary transfers to general services
HS	Harmonized Commodity Description and Coding System (Harmonized System) of tariff nomenclature
IAMO	Leibniz Institute of Agricultural Development in Transition Economies
IDB	Inter-American Development Bank
IFPRI	International Food Policy Research Institute
ISRER	Institute of Scientific Research on Economic Reforms
MAFAP	Monitoring and Analysing Food and Agricultural Policies
$\mathbf{M_i}$	volume of imports of commodity *i*
na	not available/not applicable
NRA	Nominal Rate of Assistance
NRP	Nominal Rate of Protection
$\mathbf{NRP_i}$	Nominal Rate of Protection for commodity *i*
$\mathbf{NRP_g}$	aggregate NRP
$\mathbf{NRP_{fg}}$	Nominal Rate of Protection at the farm gate
$\mathbf{NT_i}$	net trade volume
OECD	Organisation for Economic Co-operation and Development
$\mathbf{P_{fg}}$	domestic price at farm gate
PSE	Producer Support Estimate
PSE BOT	budgetary transfers to producers
$\mathbf{RP_{fg}}$	reference price at farm gate

RP_{fgi}	reference price of commodity i at the farm gate
SDGs	Sustainable Development Goals
SPS	Sanitary and Phytosanitary Measures
TI	trade intensity
Total BOT	total budgetary and other transfers
TRQs	tariff rate quotas
USD	United States dollar
VAT	value-added tax
VP	value of production (agricultural output)
WB	World Bank
X_i	volume of exports of commodity *i*
Y_i	domestic production of commodity *i*

Executive summary

Transparent and effective agricultural and trade policies are essential to meet growing demands for safe and nutritious food in a sustainable way. In most Eastern Europe, Caucasus and Central Asia (EECCA) countries, policy interventions such as agricultural subsidies are a defining feature of food and agricultural markets. However, there has not been any systematic effort to quantify impacts of these policies. For three countries in the region – Kazakhstan, the Russian Federation and Ukraine – the Organisation for Economic Co-operation and Development (OECD) calculates agricultural policy support indicators such as the well-established indicators of Producer and Consumer Support Estimates (PSE/CSE) and the General Services Support Estimates (GSSE). As part of the European Union's monitoring policy, OECD efforts also cover the three Baltic States: Estonia, Latvia, and Lithuania (OECD, 2018).

For other countries in EECCA, there have been only a few agricultural policy monitoring and evaluation efforts to record and analyse the shift from centrally planned economies to market economies in the early 1990s, for example by K. Anderson and J. Swinnen (2008) in *Distortions to Agricultural Incentives in Europe's Transition Economies*, covering the period from 1991 to 2005. Comparable time series of policy indicators are not available for recent years for these countries.

This study contributes to filling this gap by measuring agricultural policy support in eight EECCA countries, utilizing a combination of methodologies used by FAO's Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme and OECD to generate a set of indicators that is consistent with indicators for other countries.[2] It also analyses agricultural support and taxation patterns in Armenia, Azerbaijan, Belarus, Georgia, Kyrgyzstan, the Republic of Moldova, Tajikistan and Uzbekistan by reviewing and documenting policies that explain incentives and disincentives to agricultural producers. This study does not cover the Russian Federation, Kazakhstan or Ukraine, as the OECD develops a complete set of agricultural support indicators for these countries.

Nominal Rates of Protection (NRPs), and where possible, Nominal Rates of Assistance (NRAs) – the two standard measures of policy-induced divergence of product-specific domestic prices from international prices – are calculated for a set of six to ten key agricultural commodities per country, covering the time period from 2005 to 2019 (product coverage varies by country and by year, depending on data availability). In addition, budgetary transfers and other supports to agriculture are analysed, in line with the OECD PSE/CSE classification (OECD, 2010).

Key findings

The direction and magnitude of policy support to agriculture varies across the countries analysed in this report. Agricultural producers in the South Caucasus countries (Armenia, Azerbaijan and Georgia) received incentives throughout most of the analysed period. Among the Central Asian countries included in this study, strong price disincentives were found at the aggregate level in Kyrgyzstan and Uzbekistan, whereas agricultural producers in Tajikistan in general received price incentives in the second part of the analysed period. For Belarus and the Republic of Moldova, the results show more moderate price disincentives compared to the Central Asian study countries. Apart from divergent trends in the aggregate level of support across countries, there is also variation in support within individual countries across different commodities. These are explored in the country chapters.

Substantial differences in agricultural policies across the eight EECCA countries are also reflected in the amounts of overall budgetary support available to the agricultural sector. While Azerbaijan and Belarus provide relatively large budgetary support to their agricultural sectors, Georgia, in comparison, provides a medium level of support, and Armenia, Kyrgyzstan, the Republic of Moldova and Tajikistan provide a relatively low level of budgetary support. For Uzbekistan, data on budgetary transfers to the agricultural sector was not available.

[2] *Agricultural policy monitoring efforts are undertaken by the World Bank, FAO and a range of other organizations, many of which are members of the Ag-Incentives Consortium established by the International Organisations Consortium for Measuring the Policy Environment for Agriculture (Ag-Incentives). http://www.ag-incentives.org/.*

During the analysed period from 2005 to 2019, most of the eight countries were net importers of agrifood products. The exception countries were the Republic of Moldova, which was a net exporter during the entire period; Belarus, which was a net exporter in most of the studied years; and Uzbekistan, which was a net exporter in the beginning of the analysed period. Belarus is by far the largest net exporter among the study countries, with growing exports throughout the analysed period.

The main trading partners of the countries analysed in this report are their neighbouring countries, in particular the Russian Federation, as it is the biggest market in the region. In addition, the European Union is an important export destination for Georgia and the Republic of Moldova, as their market access and overall trade relations with the European Union have been strengthened through the establishment of Deep and Comprehensive Free Trade Areas (DCFTA) in 2016. Armenia's main exportable commodities are grapes, apricots and, in recent years, tomatoes. For Azerbaijan, they are hazelnuts, tomatoes, persimmons and cotton, while Belarus is an important net exporter of animal products (milk, bovine meat, poultry meat and eggs). Georgia exports hazelnuts and Kyrgyzstan exports dry beans, cotton, honey and milk. The Republic of Moldova mainly exports sunflower seed, wheat, maize and fruit (apples, grapes and plums) and Tajikistan and Uzbekistan are net exporters of cotton. Uzbekistan also exports sweet cherries, tomatoes and apricots.

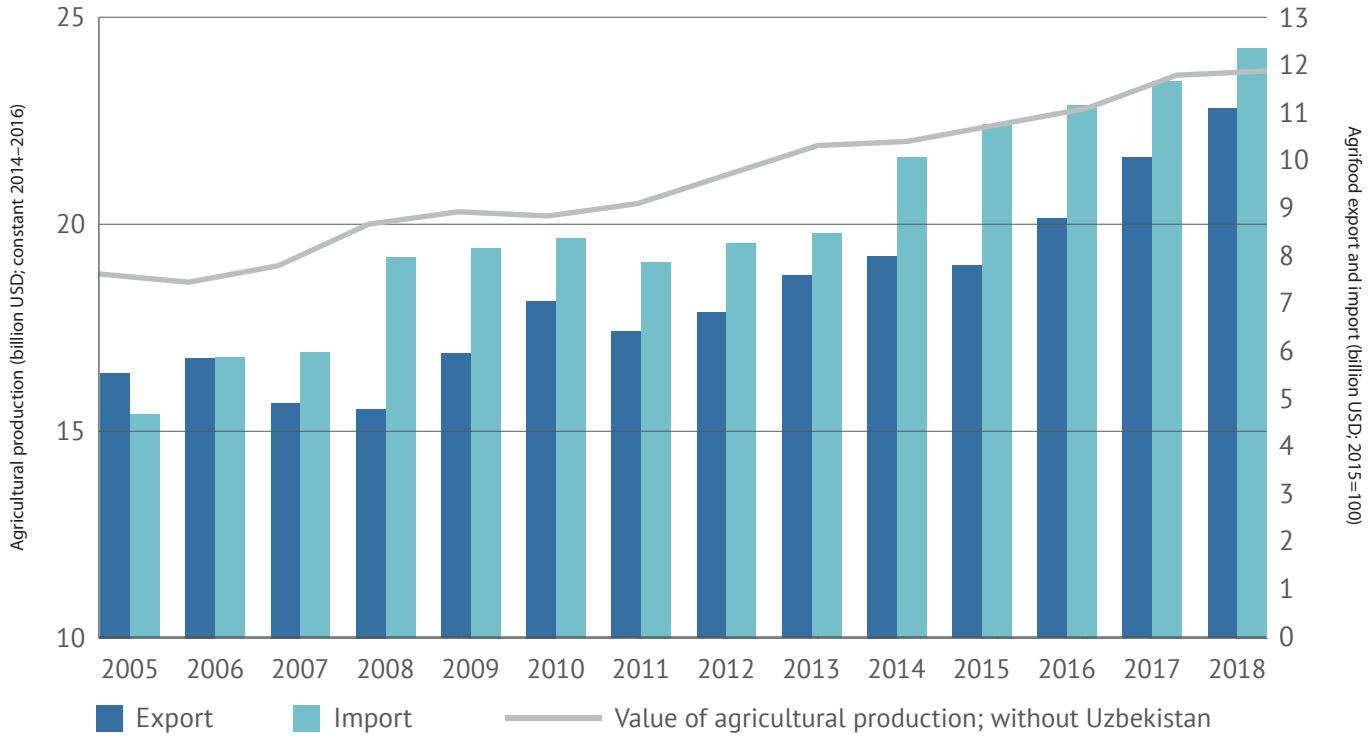
Domestic agricultural and trade policies do not appear to be the factors to influence the estimated price incentives and disincentives for agricultural producers in the eight EECCA countries. Macroeconomic, political and sectoral developments and other exogenous factors appear to affect substantially the estimates (see, for example, Mogilevsky, 2017). The estimates of price distortion indicators are also influenced by the weak overall market functioning in most countries, which is common in many low- and middle-income countries. Factors that impede price arbitrage between domestic and international markets in these countries include limited market integration, asymmetric distribution of market power, lack of market institutions and underdeveloped physical infrastructure (MAFAP, 2015).

Chapter 1.
Agricultural market and policy developments in the countries

1.1 Key market developments and main trading partners

Real gross agricultural output of the analysed countries at an aggregate level,[1] excluding Uzbekistan (for which FAOSTAT data was not available), grew at a compound annual growth rate of almost 2 percent in the 2005–2018 period. At the same time, the agrifood foreign trade of all eight study countries in real terms[2] grew at a higher compound annual growth rate of 6 percent. While both agrifood imports and exports increased during the analysed period, the countries in this study remained net importers of agrifood products during most of the period (Figure 1).

Figure 1. Value of gross agricultural production and agrifood foreign trade, aggregate of the study countries, 2005–2018[a]



[a] *Value of production: Uzbekistan is not included (FAOSTAT data not available).*

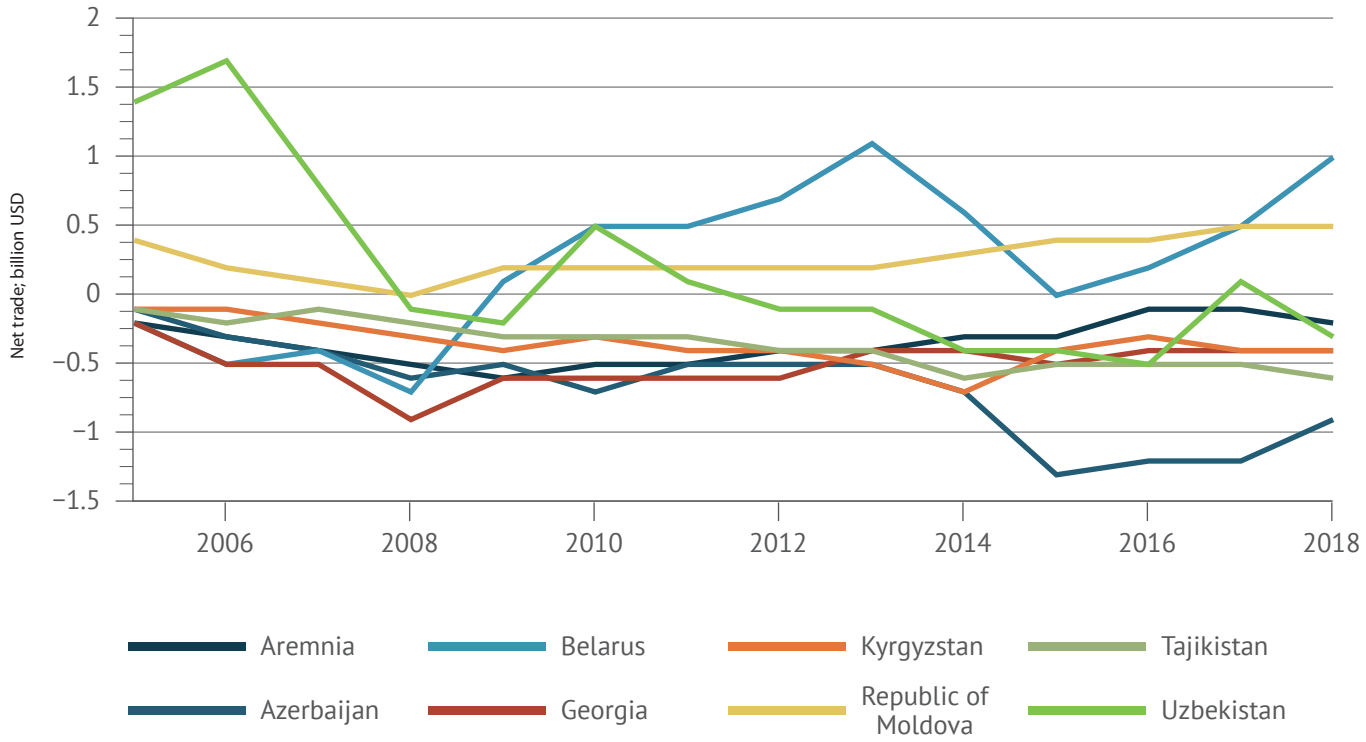
Source: FAO calculations using FAOSTAT data on agricultural production and trade. FAOSTAT. 2020. Data on agricultural production, value of agricultural production, agricultural trade by selected countries. Rome, FAO. http://www.fao.org/faostat/en/#data

Among the countries analysed in this study, only the Republic of Moldova was a net exporter of agrifood products throughout the entire 2005–2018 period (Figure 2). Belarus changed its trade status from being a net agrifood importer until 2009 to a net exporter (with the exception of 2015). Belarus is by far the largest net exporter among the eight study countries in terms of trade value during the analysed period, except in the 2005–2008 period when Uzbekistan's net exports were higher. From 2012, Uzbekistan was a net importer (with the exception of 2017). Azerbaijan and Tajikistan experienced increased net agrifood foreign trade deficits – most notably Azerbaijan after 2014. After 2015, trade deficits decreased in Armenia, Georgia and Kyrgyzstan driven by substantial export growth.

[1] *Measured in constant 2014–2016 prices.*

[2] *Measure in 2015 prices.*

Figure 2. Net agricultural exports by country (constant 2015 billion USD), 2015–2018



FAO calculations using FAOSTAT data on crop and livestock products trade. FAOSTAT. 2018. Commodity Balances – Crops Primary Equivalent. [online]. Rome, FAO. http://www.fao.org/faostat/en/#data/BC

The main trading partners of the eight countries analysed in this report are other EECCA countries (Annex 1), however their trends with regard to trade openness and trade integration with other countries are divergent. Some countries are expanding their trade relations with the European Union, while others are focused on strengthening trade ties with the Russian Federation through the Eurasian Economic Union (EAEU) (FAO, 2018b, 2020).[3] For all countries, grain imports (wheat, maize) are mainly sourced from the Russian Federation, while milk and dairy products are imported from Ukraine, Belarus or the Russian Federation. Key export products analysed in this study, especially fruit and tomatoes, are destined for the Russian Federation or its neighbouring countries (such as China, Kazakhstan and Ukraine). Türkiye is the main export destination for cotton from Azerbaijan and Kyrgyzstan, while China is the main destination for Uzbek cotton, and Islamic Republic of Iran for cotton from Uzbekistan and Tajikistan. Meat imports originate to a large extent from Ukraine or from other major global exporters, for example India or China (bovine meat), as well as Brazil or the European Union (pig and poultry meat).

1.2 Trade agreements

The eight countries increasingly participate in multilateral, regional and bilateral trade agreements. Apart from the immediate effects on trade flows, participation in trade agreements has helped improve the countries' institutional capacities for trade, increase adoption of international standards and align domestic policies and processes with these international standards (FAO, 2018b).

Five countries covered in this report are members of the World Trade Organization (WTO): Armenia (since 2003), Georgia (since 2000), Kyrgyzstan (since 1998), the Republic of Moldova (since 2001) and Tajikistan (since 2013). Azerbaijan, Belarus and Uzbekistan are currently granted observer status.

[3] *The analysis of trade flows is for brevity reasons based on United Nations Comtrade data for the 2015–2019 period, or, in the case of unavailable data, for the 2014–2018 period (Annex 1). This period does not represent the entire studied period of the calculated indicators, which is 2005–2018/2019.*

Armenia, Belarus and Kyrgyzstan are, together with Kazakhstan and the Russian Federation, members of the EAEU, which came into force in 2015. Uzbekistan became an EAEU observer on 11 December 2020. The EAEU establishes free movement of goods, services, capital and labour, and members pursue coordinated policies in many sectors, including agriculture. EAEU members are harmonizing their national policies, including support to agriculture and sanitary and phytosanitary (SPS) regulation. EAEU members are committed to adopting the Common Customs Tariff (CCT), which, for Armenia and Kyrgyzstan presents a certain inconsistency with their WTO market access obligations, as for some agricultural products the CCT of the EAEU is higher (FAO, 2016).

With the exception of Georgia, all other countries in this study are signatories to the Commonwealth of Independent States Free Trade Area (CIS FTA), which came into force in 2012. However, Georgia has bilateral free trade agreements with the CIS countries (FAO, 2016). CIS FTA defines a free trade area and replaces several bi- and multilateral free trade agreements in the region between former republics of the Soviet Union.

Georgia and the Republic of Moldova have signed Association Agreements and established free trade areas with the European Union – DCFTAs – which formally entered into force in 2016. Both countries are therefore harmonizing their national legal frameworks with those of the European Union, including those focusing on trade facilitation, technical regulation and SPS measures (FAO, 2018b). In 2018, a Comprehensive and Enhanced Partnership Agreement (CEPA) between Armenia and the European Union entered into force.

Since 2016, a preferential trade regime for Kyrgyzstan's trade with the European Union (under the European Union's Generalized Scheme of Preferences or GSP+) allows Kyrgyzstan to export some agrifood products to the European Union at zero or reduced tariff rates. Armenia is a beneficiary of the same regime granted by the European Union since 2014. Georgia and the Republic of Moldova were also benefiting from preferences granted by the European Union through GSP (until 2005) and later GSP+, until replacing them with DCFTA in 2016.

The member states of the European Free Trade Association (EFTA) (Iceland, Liechtenstein, Norway and Switzerland) signed a free trade agreement with Georgia in 2016, which entered into force in 2018. The agreement provides for zero tariff rates for some agricultural goods.

The eight countries analysed in this study participate in many other trade agreements, treaties and organizations. Azerbaijan and Kyrgyzstan are members of the Economic Cooperation Organization (ECO), which also includes Afghanistan, the Islamic Republic of Iran, Kazakhstan, Pakistan, Tajikistan, Türkiye, Turkmenistan and Uzbekistan. An Economic Cooperation Organization Trade Agreement (ECOTA) aims to establish a free trade regime between the ECO members but has so far only been signed by Tajikistan. Moreover, the countries have several bilateral trade agreements with each other and other countries in the region or with major global trading partners (for example, the free trade agreement between Georgia and China since 2016 or between the Republic of Moldova and Türkiye, in place since 2016). South Caucasus countries (Armenia, Azerbaijan and Georgia) and the Republic of Moldova are also members of the Organization of the Black Sea Economic Cooperation (BSEC). The Republic of Moldova is a member of the Central European Trade Free Agreement (CEFTA).

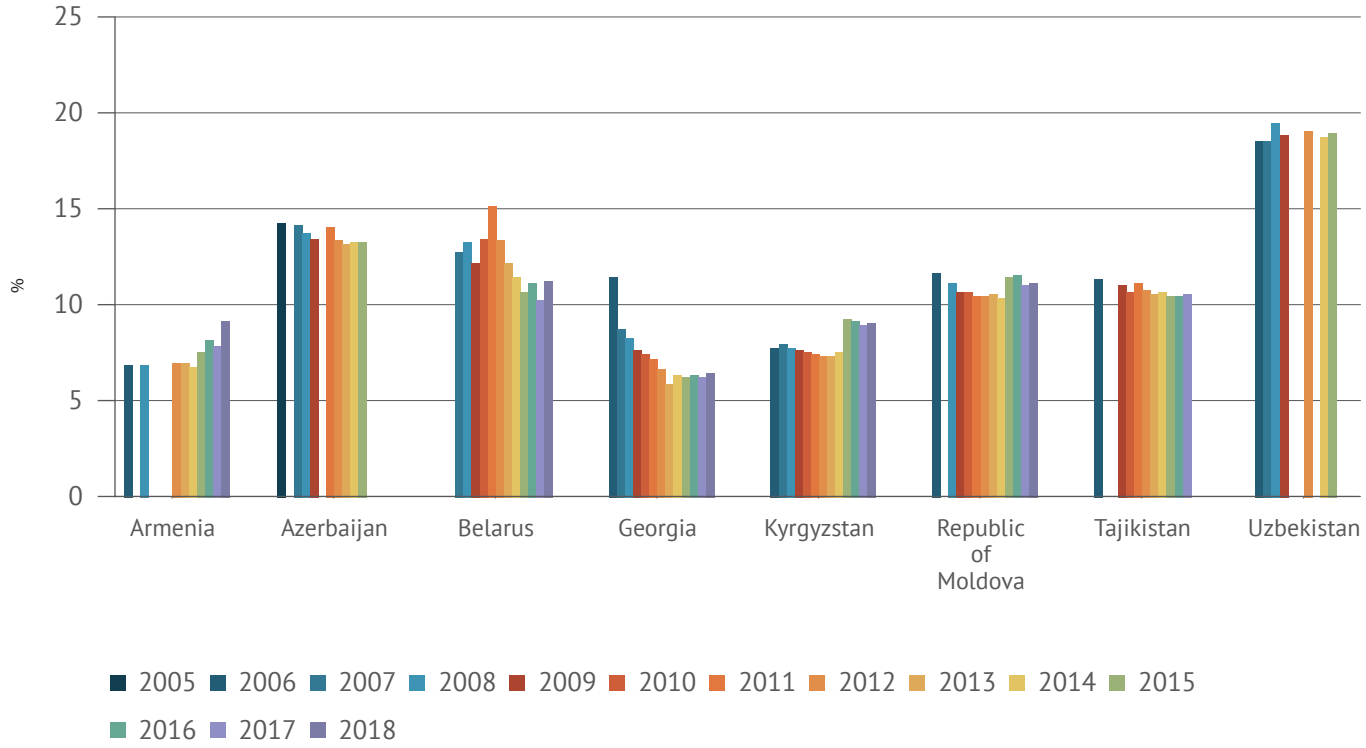
1.3 Trade and agricultural policies

Agricultural incentives or disincentives to farmers can be driven by a number of government policy interventions (such as, import tariffs or quotas; taxes or subsidies on domestic production; minimum prices; or other types of measures regulating agricultural markets). The most common types of agricultural support measures in the analysed countries include: tax concessions, investment support, subsidized interest rates/credit and input subsidies (for example, for seeds, fertilizers and fuel), leasing of machinery to farmers at reduced cost, subsidized insurance schemes, as well as market interventions such as government procurement from farmers and price controls (e.g. administered prices) (FAO, 2018b, 2020).

Border measures vary significantly by country. Among the countries in this study, Uzbekistan has the highest tariffs on agricultural imports (around 18 percent on average in the 2005–2018 period; Figure 3), followed by Azerbaijan (almost

13 percent) and the Republic of Moldova (around 10 percent). Average applied agricultural tariff rates are the lowest in Kyrgyzstan (7.2 percent), Armenia (6.9 percent) and Georgia (6.8 percent). Countries that are members of the EAEU are in the process of aligning their national tariff schedules with the CCT. The new Customs Code of the EAEU entered into force on 1 January 2018 and replaced the Customs Code of the Customs Union that had been in place from mid-2010.

Figure 3. Average agricultural applied tariff rates, MFN simple average (percent), 2005–2018[a]



[a] *Data missing for certain years, most notably for Uzbekistan, Tajikistan and Azerbaijan.*

Source: World Bank. 2020. World Integrated Trade Solution. https://wits.worldbank.org/

Tariff rate quotas (TRQs) are applied by EAEU members for beef, pig meat, poultry meat and edible offal of poultry (FAO, 2018b). Georgia, Tajikistan and Uzbekistan do not apply TRQs.

In addition to import duties and TRQs, the countries of the region are actively applying non-tariff measures (in particular SPS requirements and technical regulations) to control imports of agricultural products to their territory. While Georgia and the Republic of Moldova already aligned their national legislation on SPS regulation with European Union legislation (FAO, 2018b, 2020), other countries are in the process of reviewing and modernizing their SPS systems to be more in line with international standards.

Finally, Belarus, Tajikistan and Uzbekistan maintained export duties on a limited number of agricultural products during the analysed period (FAO, 2020). Uzbekistan also applied quantitative restrictions on exports of some agricultural products and even banned some exports, but this ban was lifted in May 2017.

Chapter 2. Methodology

2.1 Calculation of the Nominal Rate of Protection (NRP) and Nominal Rate of Assistance (NRA)

The main indicator used in the report, the NRP, captures price incentives (or disincentives) that agricultural producers receive due to domestic policies. It can be described as a farm-to-border-price ratio, a gap between the (possibly) distorted domestic farmgate price (the price that producers receive) and an international reference price. This reference price can be thought of as the price that would be in place in the absence of domestic price, market and trade policies (Anderson, 2009). The reference price reflects the opportunity cost to domestic producers. In order to make the prices comparable, that is, take them to the same points in the value chain, information on exchange rate distortions, quality and quantity adjustments, marketing margins, and handling, transportation and processing costs need to be accounted for.

Price distorting measures include government interventions at the national border (such as import tariffs, export subsidies, and import or export quotas), and at the domestic level (such as direct price administration, production quotas and public stockholding) (OECD, 2016). Though aiming to measure exclusively the effects of policy-related distortions, the NRPs may also sometimes capture non-policy factors, such as the impact of overall market performance on prices. Inefficient market functioning is common in many low- and middle-income countries and is characterized by factors that impede price arbitrage between domestic and international markets, such as limited market integration, asymmetric distribution of market power, lack of market institutions and underdeveloped physical infrastructure (MAFAP, 2015).

The NRP at farm gate (NRP_{fg}) is defined as follows (adapted from MAFAP, 2015):[4]

Eq. [1]

$$NRP_{fg} = \frac{P_{fg} - RP_{fg}}{RP_{fg}} * 100$$

where P_{fg} is the domestic price at farm gate and RP_{fg} is the reference price at farm gate.

Expressed in percentage terms, the NRP estimates by how much gross returns to farmers with government interventions exceed (positive NRPs) or fall below (negative NRPs) gross returns to farmers if no policy interventions are in place (Anderson, 2009). NRPs at the farm gate are positive when the domestic price is higher than the reference price, meaning there is a price distortion present and producers are incentivized to produce a commodity. NRPs at the farm gate are negative when reference prices exceed domestic prices, meaning that domestic market and trade policies, and possibly market performance, generate disincentives to agricultural producers.

Commodity-specific indicators can be aggregated into product groups or country-level aggregates. Typically, the aggregate indicators are calculated as weighted averages based on each commodity's relative contribution to the total value of agricultural production:

Eq. [2]

$$\frac{\sum_{i=1}^{i=n} NRP_i * Y_i * RP_{fgi}}{\sum_{i=1}^{i=n} Y_i * RP_{fgi}}$$

Where NRP_g is the aggregate NRP for a subset of n commodities, NRP_i is the NRP for commodity *i*, Y_i is the volume of production in tonnes (or any other unit) of commodity *i* and RP_{fgi} is the reference price of commodity *i* at the farm gate (MAFAP, 2015).

[4] *MAFAP (2015) distinguishes between observed and adjusted NRP. For this study, observed NRPs have been estimated, and are based on the actual market and policy situation in the country. In comparison, the adjusted domain of indicators is based on the estimation of a fully efficient value chain setting.*

Box 1: The International Organisations Consortium for Measuring the Policy Environment for Agriculture

Agricultural, market and trade policies affect trade flows, farm income and food prices at the national and international level. The pattern of incentives to agriculture is continuously changing, with support to agriculture provided by a wide range of measures, and protection rates varying not only in response to explicit changes in policy, but also reflecting movements in world agricultural prices.

In order to better understand and monitor policy impacts on trade and markets and support evidence-based decision making in the countries, a number of international organizations (FAO, IDB, IFPRI, OECD and WB) joined forces to establish the International Organisations Consortium for Measuring the Policy Environment for Agriculture (the Ag-Incentives Consortium). The Consortium builds on the individual efforts of the international organizations to improve the knowledge of agricultural policies. Its main aim is to provide a harmonized and continuously updated database of measures of agricultural support for countries worldwide (AgIncentives, 2018).

To date, the Nominal Rate of Protection (NRP) indicators are included in the database of the Ag-Incentives Consortium, as the core indicators on support provided by agricultural policies to producers. The Consortium has plans to also publish NRAs in the near future.

The dataset currently covers 61 countries (covering the European Union, the United Kingdom of Great Britain and Northern Ireland members as single entity), representing close to 90 percent of the global value of agricultural production. Indicators span from 2005 and are updated biannually. The NRPs and NRAs developed for the eight countries in this study are conceptually equivalent to the Consortium's methodology and can be compared to the NRPs of the countries that are already covered.

Source: AgIncentives. 2018. International Organisations Consortium for measuring the policy environment for agriculture. http://www.ag-incentives.org/content/about-us.

Calculation of the Nominal Rate of Assistance (NRA)

In addition to NRPs, and depending on the availability of data on commodity specific budgetary transfers, a construction of Nominal Rate of Assistance (NRA) is also possible. The NRA is an extension of the NRP and is calculated in a similar way, with the addition of public expenditure to the price gap at the farm gate. It is expressed as (adapted from MAFAP, 2015):

Eq. [3]

$$NRA = \frac{(P_{fg} - RP_{fg}) + BOT_c}{RP_{fg}} * 100$$

where P_{fg} is the domestic price at farm gate, RP_{fg} is the reference price at the farm gate and BOT_c is the commodity-specific public expenditure, measured as monetary units per quantity unit.

The difference between the two indicators is that in addition to the impact of domestic price distorting policies and overall market performance, which is already covered by the NRP, the NRA also measures the effects of public expenditure on the incentives received by producers. The NRA estimates by how much government policies, including transfers, have increased or decreased gross returns to producers above or below the scenario without government interventions (MAFAP, 2015). Adding budget information to the NRP provides a more complete picture of the prevalent price incentives/disincentives, especially when budgetary payments cancel out the existing price disincentives to agricultural producers.

It should be noted that the calculation of NRAs was only possible for a subset of the analysed commodities, as the majority of the budgetary support provided in the study countries was not commodity-specific or its attribution to specific commodities was not possible due to limited information. Nevertheless, it is important to acknowledge that this type of support also influences production decisions and prices of the individual commodities and therefore NRAs provide a more complete picture of the overall price distortions.

2.2 Selection of commodities and data requirements

The main criteria for selection of agricultural commodities for the analysis was their contribution to the total value of national agricultural production. The latest FAOSTAT data for gross agricultural output in constant 2004–2006 million USD was used (FAO, 2018a), as available at the start of this study. The average value of production was taken for the 2014–2016 period to smooth out any unusual year-on-year fluctuations.

Agricultural production in most of the analysed countries is highly diversified, and therefore the initial objective to include all products that cumulatively account for at least 70 percent of the total value of agricultural production (OECD, 2016) was difficult to achieve, given the scarcity of data for individual commodities. Therefore, the threshold was lowered to 50 percent.[5] Methodological decision was made to limit the number of commodities per country to eight or ten. For Uzbekistan, the FAOSTAT data on the value of agricultural production by individual commodities was not available, therefore the six key commodities were selected solely based on consultation with the country expert who participated in the analytical work.

While the initial list of products was based on the value of production, the final product coverage was decided in coordination with country experts and the respective government focal points who saw value in prioritizing products of strategic importance (for example, based on perceived export potential).

The final criteria for the selection of products for the analysis was the availability of the product-specific data. This was a particular limitation for Tajikistan and Uzbekistan, which were added to the analysis at a later stage. For both countries, data for several commodities was not available at the product level. For example, in Tajikistan the key meat products, as well as fruits and vegetables, are aggregated in national statistics. In Uzbekistan, data is aggregated for meat and milk. As a result, for Tajikistan and Uzbekistan, the study aimed to analyse six key commodities.

For four commodities, potatoes, grapes, sheep meat and eggs (with the exception of eggs in Belarus), the NRPs were not calculated. Instead, only domestic producer prices and reference prices at the farm gate are presented. The main reason is the low tradability of these commodities, which are typically produced by smaller farms that are not market-oriented and produce largely for own consumption or sporadic local sales. The law of one price, which is the underlying assumption on which the MAFAP approach for evaluating price incentives is based, is not applicable to non-tradable commodities (MAFAP, 2015). For these commodities, it is more relevant to look at the price movements and market conditions than the actual NRPs. In total, 21 different commodities (14 crop commodities and 7 livestock commodities) were selected for the analysis, six to ten commodities per study country, adding up to 66 country/commodity indicators in total. The final list of commodities and their representativeness in the value of agricultural production by country is shown in Annex 2.

To calculate NRPs and NRAs for agricultural commodities, the following data is required:[6]

- foreign trade data to calculate trade status, trade intensity and border prices (for example, unit export/import values);
- domestic prices at farm gate level (that is, farm gate or producer prices);
- alternative reference prices at farm gate level;
- production volumes and values;
- exchange rates and inflation rates;
- market access costs: from the border to point of competition (usually the wholesale market) and from point of competition to farm gate;
- budgetary and other transfers (BOT) to agriculture; and
- quality and quantity adjustment factors (if required).

[5] *The aggregate share of all commodities based on FAOSTAT data for the 2014–2016 average (in constant 2004–2006 prices; FAO, 2018a) is exceeding the 50 percent threshold for the majority of study countries. However, the share remains rather low for Armenia (45 percent). Similarly, the cumulative share is also low for Tajikistan (44 percent); however, this is somewhat expected, as the aim for the new study countries (Tajikistan, Uzbekistan) was to analyse up to six commodities in total. The aggregate shares of all commodities in terms of value of agricultural production according to national statistics data (presented in Annex 6), were generally lower than the aggregate shares based on the FAOSTAT data, using the 2014–2016 average.*

[6] *All monetary values are given in US dollar.*

National experts who participated in this study provided descriptions of the selected value chains. This information revealed important insights into the structure of the market and the specifics of its functioning, identifying the main marketing channels, as well as relevant prices and access costs for selected commodities.

2.3 Trade data analysis: net trade status and trade intensity

The effects of market and policy interventions differ depending on whether a commodity is exported or import-competing, and if it is traded strongly or thinly. Therefore, trade data is analysed as a first step to determine the net trade status and trade intensity of the selected commodities.[7] The net trade position for a commodity was calculated using the following equation (MAFAP, 2015):

Eq. [4]

$$NT_i = X_i - M_i \begin{cases} if\, NT_i > 0 \text{ the country is a net exporter} \\ if\, NT_i > 0 \text{ the country is a net exporter} \end{cases}$$

Where NT_i is the net trade volume, X_i is the volume of exports of commodity i, and M_i is the volume of imports of commodity i.

The concept of trade intensity was used to evaluate the relative share of trade over apparent domestic consumption of a commodity. Trade intensity was calculated for each year of the analysed period as follows (MAFAP, 2015):

Eq. [5]

$$TI = \frac{X_i + M_i}{Y_i + M_i - X_i} * 100$$

Where TI is the trade intensity, X_i is the volume of exports of commodity i, M_i is the volume of imports of commodity i, and Y_i is the domestic production of commodity i.

In cases where the calculated trade intensity was very low (commodities were thinly traded), the robustness of the analysis could be affected, and therefore alternative reference prices at farm gate were considered in the calculation of the policy indicators.

2.4 Determining the reference price

To calculate the price gap for a commodity, two prices are needed, as shown in eq. [1]: producer price and the comparable reference price at the farm gate. While producer prices were provided by national experts (data sources are listed in Annex 3), the reference prices were constructed from border prices, based on unit export and unit import values. The net trade status for a specific commodity determined which international border price was used in the analysis for each year (MAFAP, 2015):

- FOB price (free on board) for commodities with a net export status; and
- CIF price (cost, insurance and freight) for commodities with a net import status.

The FOB price is the cost of an exported commodity at the exit point of the country measured when the goods are loaded onto a ship or another means of transport. The CIF price is the landed cost of an imported commodity on the dock or another entry point, including the cost of international freight and insurance. It excludes any charges after the imported good touches the dock, e.g. any domestic taxes, fees, duties or subsidies (MAFAP, 2015).

[7] *Each country's net trade status and trade intensity for a specific commodity were determined for each year of the analysed period and for HS 4-digit codes or HS 6-digit codes (for the countries that provided foreign trade data on 6-digit codes).*

To calculate reference prices at the farm gate and compare them to the corresponding producer prices, access costs and adjustment factors need to be quantified. Access costs include all costs that are required to move the commodity from one point in the value chain to the other, for example, for an exported commodity, from farm gate to the point of competition and from the point of competition to the border. They cover all actual marketing costs and margins observed in the market pathway, whether officially paid for services (such as, transportation, taxes or profit margins for the involved agents) or not (illicit costs, such as bribes). Internal transport and related costs can provide a "natural" rate of protection to imported commodities and implicit taxation to exported commodities (MAFAP, 2015).

Depending on trade status, access costs from the border to the point of competition and from the point of competition to the farm gate or vice versa are of importance. These costs were collected, where possible, for the following categories: transport, margins, processing, handling, taxes and fees, and others.

Due to difficulties with obtaining reliable market access costs, some simplifications were applied. If access costs for an imported commodity were missing, incomplete or deemed unreliable, they were omitted from the calculation of reference prices as different elements of access costs can be assumed to offset each other.[8] Such simplification is consistent with the OECD approach (OECD, 2016) and was applied in the following cases of imported commodities for which CIF prices were used for the calculation of the reference prices:

- Belarus: apples, maize, pig meat, poultry meat, wheat (2005 to 2008);
- Republic of Moldova: milk, potatoes, pig meat, poultry meat; and
- Tajikistan: all commodities except cotton.

Moreover, no access costs were available for any commodity produced in Uzbekistan. For this reason, the results for Uzbekistan are indicative only, and the analysis presented here should be treated as an exploratory step rather than definite findings.

Next, quantity and quality adjustment factors were considered. A quantity adjustment factor is required if a commodity is processed or exposed to other physical treatment between two points in the value chain (OECD, 2016), for example, when hazelnuts are shelled or raw milk is processed into milk powder. A quality adjustment factor is required if quality differences (such as, in terms of colour, size, oil, fat and protein content, etc.) exist between two points in the value chain (for example, domestic versus imported products) or if more than one quality of a product is exported (for example, milling versus feed quality wheat exports in Ukraine or higher-priced Arabica coffee versus lower-priced Robusta coffee in Brazil) (OECD, 2016).

Considering the adjustment factors in the calculation of reference prices ensures that producer prices and reference prices are for the same commodity, and the gap between them accounts only for policy support or possible market performance issues.

The calculations of policy indicators for cotton did not consider the domestic producer prices at the farm gate level, which refer to raw cotton, but prices at a higher level in the value chain in order to ensure the comparability (main reason being missing or unreliable ginning costs data). Therefore, the NRPs for cotton in this study reflect the price differences of cotton lint at the ginnery (point of competition) level and at the border of a country.

2.4.1 Alternative border prices

When available, unit values at the border were used in the calculation of reference prices for comparison with domestic prices to producers. In cases where prices based on unit values were not available or deemed not sufficiently reliable for a specific country and commodity, alternative border prices were used (see Annex 4). Alternative border prices were constructed from FOB/CIF prices, of a key trading partner, neighbouring country or other relevant large player in the region (Russian Federation, European Union, Türkiye or Ukraine), adjusted for insurance and freight costs.

[8] *This approach is solely based on OECD approach and differs from the MAFAP methodology, where this practice is not used.*

2.5 Budgetary transfers and their classification

The budgetary support classification used in this study is based on the OECD methodology (OECD, 2016).[9] The budgetary transfers include (1) explicit support to agricultural value chain agents through budgetary expenditures, including direct payments, investment grants, co-financing of services and projects, and (2) support based on budgetary revenue forgone, such as tax concessions, preferential lending, debt concessions, and administered prices, among others (OECD, 2016). These are classifying as follows (OECD, 2016):

1) Budgetary and other transfers to producers (PSE BOT):

A policy measure is included in PSE BOT if it (a) provides a transfer whose incidence is at the farm level and (b) is directed specifically to agricultural producers. Measures are classified into seven main categories (classified according to implementation criteria):

A. support based on commodity output;
B. payments based on input use;
C. payments based on current area/animal number/receipts/income, production is required;
D. payments based on non-current area/animal number/receipts/income, production is required;
E. payments based on non-current area/animal number/receipts/income, production is not required;
F. payments based on non-commodity criteria; and
G. miscellaneous payments.

2) Budgetary and other transfers to consumers (CSE BOT):

If a policy measure provides positive transfers to first consumers of agricultural commodities (e.g. flour mills or meat-processing plants), it is included CSE BOT. Measures that support agriculture, e.g. distribution of government stocks acquired in the context of market interventions, are also included. These measures cannot be attributed to individual agricultural producers or general service support, but consumers have an indirect benefit from them. CSE BOT can be commodity specific transfers to consumers and non-commodity specific transfers to consumers.

3) Budgetary and other transfers to general services (GSSE BOT):

The transfers to general services (GSSE BOT) are payments to eligible private or public services provided to agriculture generally, and include policies where primary agriculture is the main beneficiary. This kind of support does not directly affect farm receipts (revenues) or consumption expenditure, although they may affect production or consumption of agricultural commodities in the longer term. GSSE measures are classified into 6 main categories, according to the nature of the service):

H. agricultural knowledge and innovation system;
I. food inspection and control;
J. development and maintenance of rural infrastructure;
K. marketing and promotion;
L. cost of public stockholding; and
M. miscellaneous.

Budgetary support was compared between countries using relative (percentage/ratio) indicators. The basic relative indicator used for comparison of the level of support was the value of transfers related to the value of agricultural production. This indicator was calculated at PSE/GSSE/CSE category level and then aggregated at higher levels using the following formulas (OECD, 2016):

Eq. [6]

$$\%PSE\ BOT_j = \frac{PSE\ BOT_j}{VP} * 100$$

[9] *While the Producer Support Estimate (PSE) – an indicator used by the OECD – also includes market price support (MPS) to producers, for the purpose of this study the classification of budgetary transfer component of the PSE is used.*

Eq. [7]

$$\%PSE\ BOT = \sum \%PSE\ BOT_j$$

Eq. [8]

$$\%GSSE\ BOT_j = \frac{GSSE\ BOT_j}{VP} * 100$$

Eq. [9]

$$\%GSSE\ BOT = \sum \%GSSE\ BOT_j$$

Eq. [10]

$$\%CSE\ BOT = \frac{CSE\ BOT}{VP} * 100$$

Eq. [11]

$$\%Total\ BOT = \%PSE\ BOT + \%GSSE\ BOT + \%CSE\ BOT$$

Where *j* is the individual PSE or GSSE category, *VP* is the value of production (agricultural output), *PSE BOT* are budgetary and other transfers to producers, *GSSE BOT* are budgetary and other transfers to general services, *CSE BOT* are budgetary and other transfers to consumers, and *Total BOT* are total budgetary and other transfers.

Expressed as a share of value of production, the budgetary support indicators can be compared between countries at different levels of aggregation.

Box 2: Limitations and future research

Calculation of agricultural policy support indicators requires very specific, detailed and high quality data, including data on domestic prices, access costs and budgetary transfers to producers. Accuracy of these data have significant implications for the quality and credibility of results. Improvements in data quality and the methodology associated with obtaining them is an ongoing process. For example, this study provides greater granularity at product level by using 6-digit HS codes for almost all commodities, and increases the accuracy in terms of the selected alternative border prices compared to the first round of calculations performed in the initial stage of this project. Of course, as in all quantitative analyses, certain assumptions and imputations had to be made, especially for missing or low-quality data.

It should also be noted that it is not always possible to capture explicitly some specific agricultural price distorting factors (for example, market imperfections and weak infrastructure) in access costs computations, and this fact may influence the NRP results. Therefore, data-related and methodological improvements, such as increased commodity coverage and refinement of the derivation of reference prices and access costs can raise the quality of the analysis and reliability of the results in future studies.

Valuable additional insight may also result from a detailed analysis of the fluctuations of national currencies against the currencies of key trading partners. Further investment into the existing regional expert network supported by FAO and development of national capacities for agricultural policy monitoring and measurement would improve the sustainability of the analysis and enhance evidence-based policymaking at different levels.

Chapter 3.
Regional analysis of agricultural price distortions and budgetary transfers

3.1 Nominal Rates of Protection

The price incentives indicators that were developed and analysed for the eight EECCA countries suggest a high degree of heterogeneity in policy support to farmers across countries and across products. Country-specific findings are discussed in detail in Chapter 4. Aggregated NRPs by country, for those years where the same products could be included in the calculations, are shown in Table 1. The list of products included in the calculations is shown in Annex 2 (Table 5). The analysis of the results is clustered using a geographical classification dividing the countries into South Caucasus countries (Armenia, Azerbaijan and Georgia), Central Asian countries (Kyrgyzstan, Tajikistan and Uzbekistan) and Eastern European countries (Belarus and Republic of Moldova).

Table 1. Aggregate Nominal Rates of Protection (NRPs) by country[a] (percent), 2005–2018

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Armenia	/	/	-8%	-1%	-9%	-2%	6%	1%	-9%	6%	8%	24%	26%	49%
Azerbaijan	-16%	-5%	-8%	5%	39%	35%	22%	31%	24%	32%	29%	-10%	/	/
Belarus	/	/	/	/	/	-17%	-34%	-9%	-14%	-17%	-9%	-19%	-13%	-8%
Georgia	/	/	/	2%	44%	-1%	14%	13%	10%	17%	13%	25%	24%	20%
Kyrgyzstan	/	/	/	/	/	-14%	-26%	-21%	-22%	-23%	-18%	6%	/	/
Republic of Moldova	19%	-1%	27%	22%	28%	4%	-3%	17%	-3%	-5%	2%	-3%	-4%	-4%
Tajikistan[b]	4%	10%	-31%	-15%	10%	5%	-18%	10%	/	/	/	/	/	/
Uzbekistan[b]	-71%	-75%	-68%	-72%	-66%	-55%	-64%	-50%	-49%	-43%	-36%	-43%	-53%	-60%

Legend:
/ - Aggregate NRP not presented due to different set of key commodities.

[a] *The NRP's are shown only for cases where the same products were included for each year in the calculation of the aggregate NRPs for the individual country. These products are listed in Table 5 of Annex 2. Chapter 4 contains NRPs for additional products that were not included in the aggregation.*

[b] *The results for Tajikistan and Uzbekistan should be treated with caution given the significant data limitations, in particular with regard to access costs, as described in section 2.4.1 and country sections 4.7 and 4.8.*

Source: Authors' calculations.

On average over the 2005–2018 period, agricultural producers in the **South Caucasus** countries received substantially higher domestic prices than the comparable reference prices. The aggregate national NRPs for Georgia seem surprisingly high in most years, given its open economy and limited policy measures in support of agriculture.[10] Further analysis reveals that other factors, such as the weak overall market functioning and therefore protection for import-competing products, could be driving these positive NRPs as they were not captured explicitly in the access costs. In Armenia, mostly negative aggregate NRPs (indicative of price disincentives to farmers), were observed in the first part of the period until 2010, while the indicator became positive for all years from 2014 onwards. For Azerbaijan, NRPs were positive from 2008 until 2015, turning negative in 2016, possibly driven by the declining global oil prices and currency devaluation.

In **Central Asia**, aggregate NRPs are strongly negative in Kyrgyzstan and Uzbekistan, implying high price disincentives for agricultural producers throughout the analysed period, while Tajikistan shows a more irregular pattern of aggregate NRPs, moving between positive

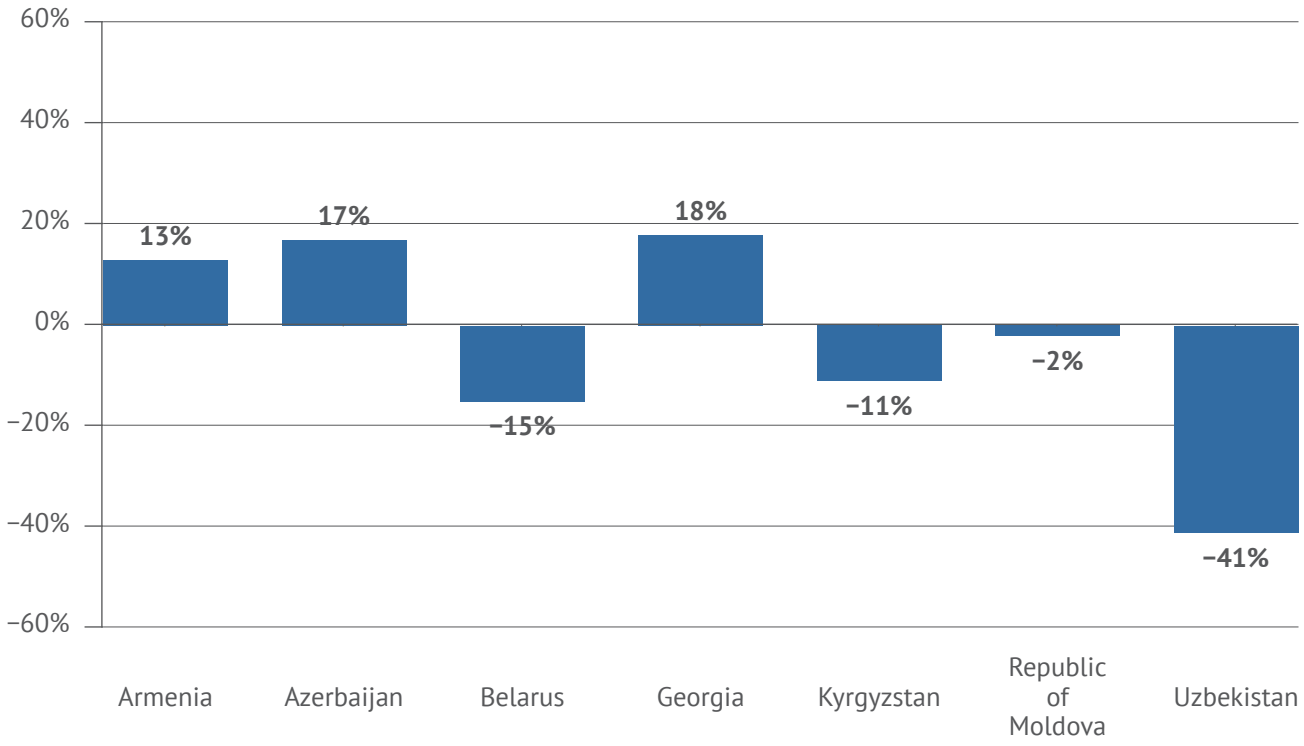
[10] *It should be taken into account that there was a change in the methodology to collect production volume data from 2014 in Georgia. For the 2006–2013 period, the main source of the sample frame of surveys was the 2004 Agricultural Census in Georgia. The sample frame for the 2014–2019 period has been updated and is based on the 2014 Agricultural Census.*

and negative NRPs. In Uzbekistan, strong negative NRPs range from -75 percent in 2006 to -36 percent in 2015, showing the strongest estimated price disincentives among the analysed countries.[11]

In the two **Eastern European countries** (Belarus and the Republic of Moldova), price disincentives are also observed in many of the analysed years, indicating implicit taxation of agricultural producers. Domestic prices were lower than comparable reference prices at the aggregate level for all years. Whereas in the Republic of Moldova, incentives to agricultural producers are observed in some years, though with an irregular pattern. NRPs fluctuated substantively from -4 percent to 28 percent in the analysed period.

Changes in exchange rates affect agricultural incentives and disincentives in the region. For example, highly overvalued currencies implicitly lower the domestic prices of exportable products. A devaluation of the national currency would provide an incentive to producers and especially exporters of agricultural products. However, other policies may be adjusted at the same time and amplify or mitigate the exchange rate effects. For example, if a devaluation is accompanied by a reduction of subsidies to farm inputs, this may outweigh the effects of a devaluation (Anderson and Swinnen, 2008).

Figure 4. Weighted aggregate Nominal Rates of Protection by countries at farm gate (percent), calculated for the 2014–2016 period[12]



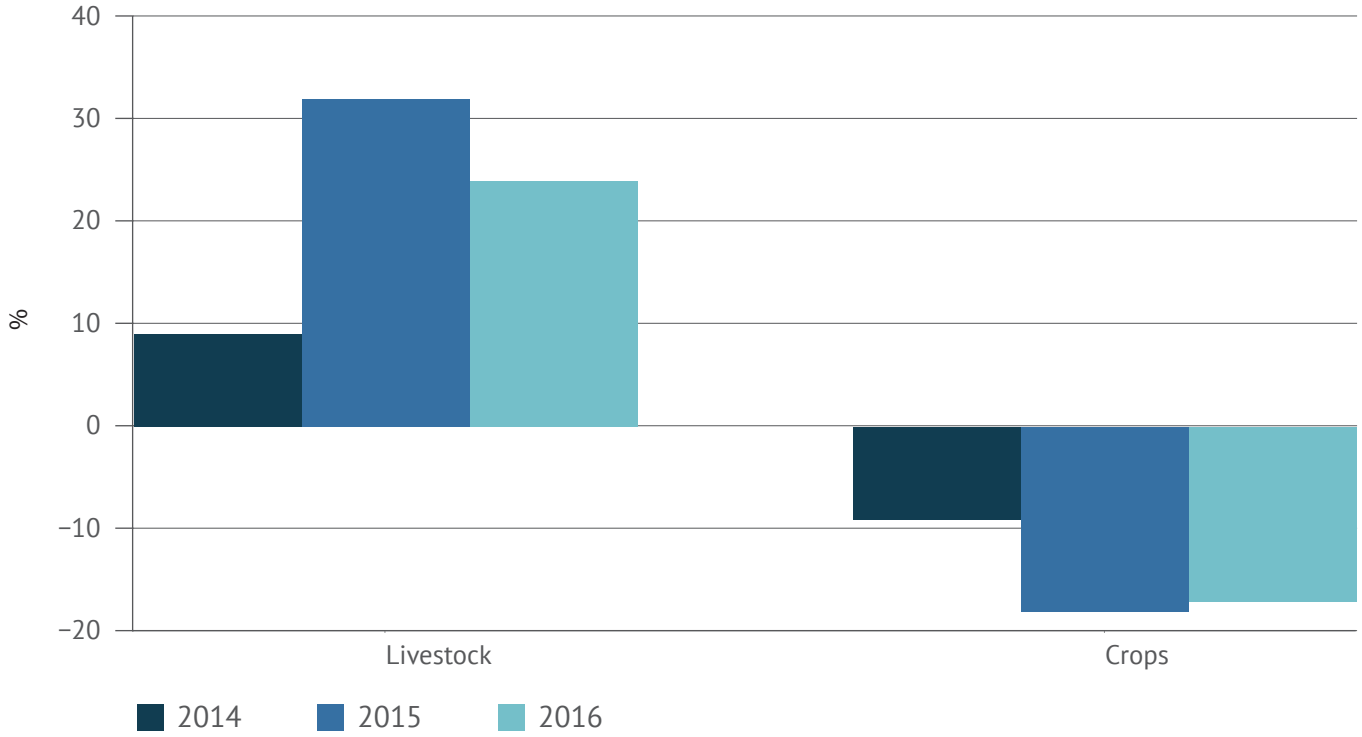
Note: Tajikistan not included due to lack of data for the 2014–2016 period.
Information on which commodities are included in the calculation of aggregate NRPs for each study country is shown in Annex 2 (Table 5).

Source: Authors' calculations.

[11] *Tajikistan and Uzbekistan entered the study at a later point than the other countries, which may impact comparability in terms of data quality.*

[12] *Weighted by value of production. Please note that, subject to data availability, the number of commodities included in the calculation of aggregate NRPs differs by country.*

Figure 5. Aggregate Nominal Rates of Protection by commodity group, livestock versus crops (percent, unweighted average), 2014–2016[13]



Note: Livestock: Tajikistan and Uzbekistan not included; crops: Tajikistan not included.

Source: Authors' calculations.

The results of the NRP calculations show that producers of livestock in the region received a higher level of price support than producers of crops over the analysed period, which is also the case for the Russian Federation, one of the major trading partners of all the analysed countries. An exception to this observation is Belarus, where, due to a system of administered prices, policy support was negative for both crops and livestock commodities. In comparison, on average for all countries monitored by the OECD, rice, sugar and sunflowers are the most supported products, followed by milk, beef and veal and other meat products (OECD, 2020a). At the country level, NRPs for crops were on average positive only in Azerbaijan, Georgia and Kyrgyzstan. The overall higher support for the studied livestock commodities can be explained by higher levels of import tariffs for these products and often weaker market integration.

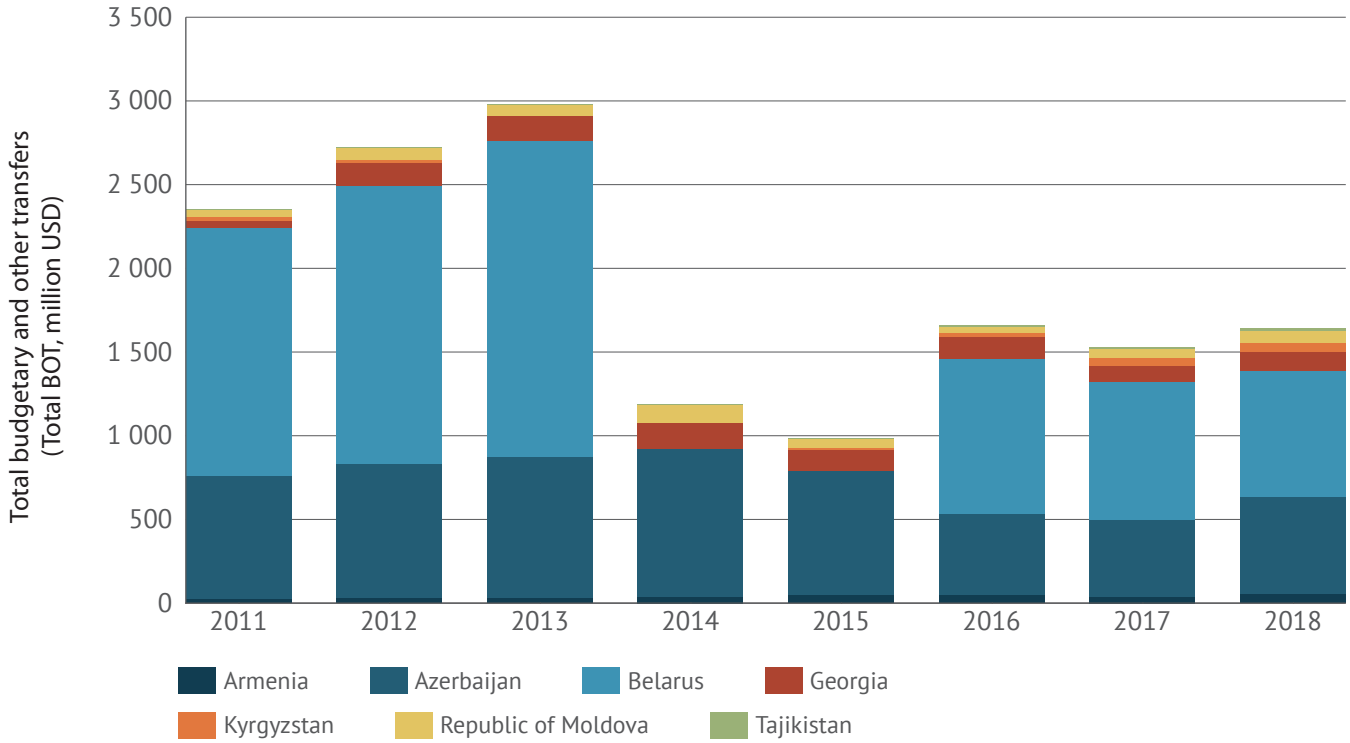
Although in theory, the NRPs are understood to be solely policy indicators, there appears to be a relatively strong contribution to agricultural price incentives by additional implicit drivers. These include market inefficiencies and imperfections, such as the effects on prices of uneven market power within value chains, asymmetric information and high trading (access) costs that include bribes and that are difficult to measure and quantify (see Swanidze *et al.,* 2019). Prevalent subsistence farming with low productivity, low quality and limited market integration are additional aspects that are difficult to quantify as part of NRP calculations. In the current study, these drivers of price incentives were not explicitly analysed. Accounting for these market imperfections requires further research to quantify their magnitude and effects on prices (see an example of such research in MacDonald, 2012).

[13] *Due to the data constraints explained earlier, Tajikistan is not included in this comparison and Uzbekistan only for crops.*

3.2 Budgetary and other transfers to agriculture

The absolute volume of budgetary support to the agricultural sector in the region varies considerably over the analysed period (Figure 6)[14]. The fluctuations are driven mainly by the changes in budgetary transfers in Azerbaijan and Belarus that led to a steady increase in the total level of transfers in the eight countries from 2011 to 2013, followed by a decline until 2017. The slight increase from 2017 to 2018 is mainly driven by transfers in Azerbaijan.

Figure 6. Total budgetary and other transfers to agriculture (BOT in million USD), 2011–2018[15]



Source: Authors' calculations.

Data on budgetary support was collected for the period 2005–2018 for almost all countries (Armenia, Azerbaijan, Georgia, Republic of Moldova and Tajikistan). Exceptions are Belarus (datasets cover 2011–2018) and Kyrgyzstan (datasets cover 2009–2018). Data for Uzbekistan was not collected during this study, therefore the budgetary and other transfers to agriculture could not be analysed. It should also be added, that for some countries and/or some years, the information on budgetary support is not complete. For example, in some cases, donor-funded projects were excluded. The specific data issues are explained in the respective country chapters.

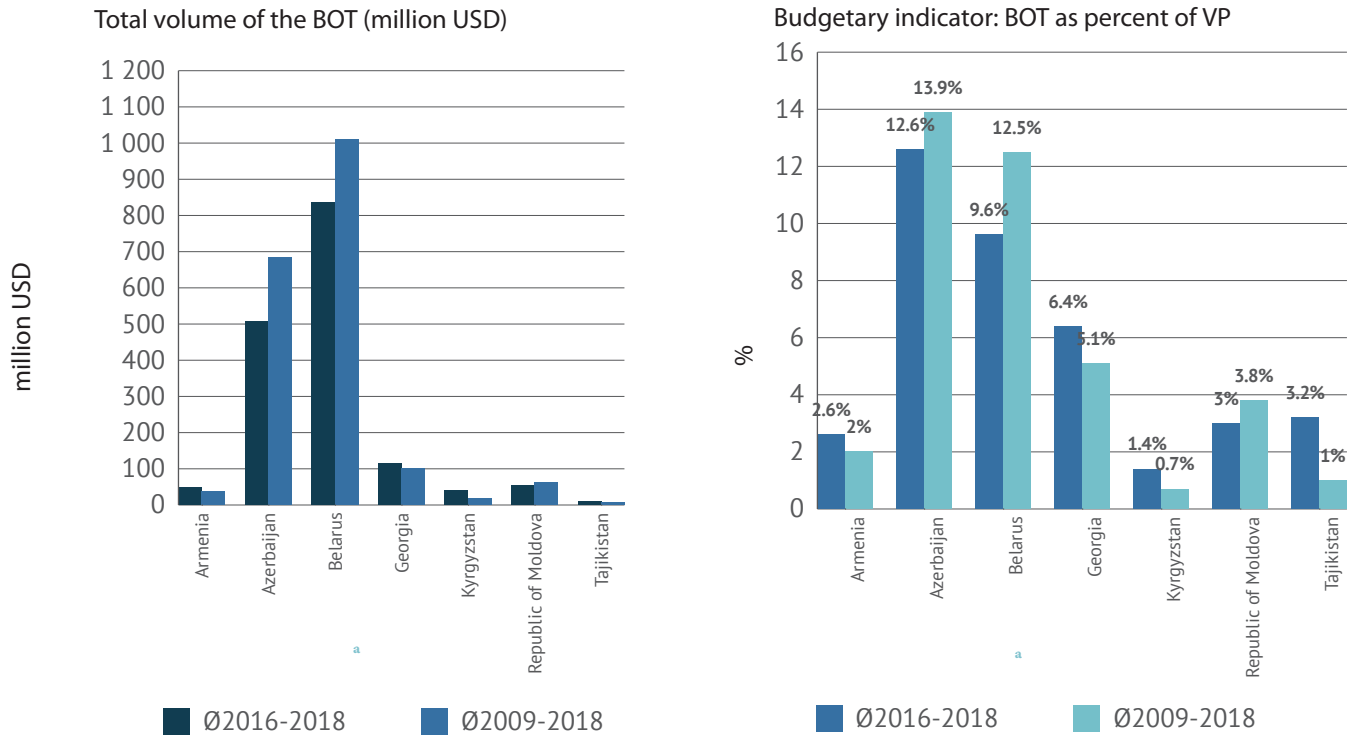
Taking a closer look at the countries in terms of their budgetary support to the agricultural sector, in minimal terms and as a share of the value of agricultural production (Figure 7), considerable variation across a countries and over time can be observed. To compare recent developments with longer-term country trends, averages of budgetary transfers were taken for the most recent period for which data was available, 2016 to 2018, and the decade 2009–2018.

[14] *Budget data for Uzbekistan was not collected during the study, therefore the budgetary and other transfers to agriculture could not be analysed. Country abbreviations in the figures in this chapter: Armenia; Azerbaijan; Belarus; Georgia; Kyrgyzstan; Republic of Moldova; Tajikistan; Uzbekistan.*

[15] *Total budgetary support includes support to producers, to general services and to consumers. In order to analyze the overall development with comparable data for most countries, this time period was chosen.*

As a share in the value of production, budgetary transfers range from very low (around 1 percent) in Kyrgyzstan to relatively high (12.6 percent) in Azerbaijan, followed by Belarus (9.6 percent). In Armenia, the Republic of Moldova and Tajikistan,[16] this share is much lower, at around 3 percent (Figure 7).[17]

Figure 7. The volume of budgetary and other transfers to agriculture (BOT in million USD and as a percent of value of production)



[a] *Belarus: BOT data available for the 2011–2018 period.*

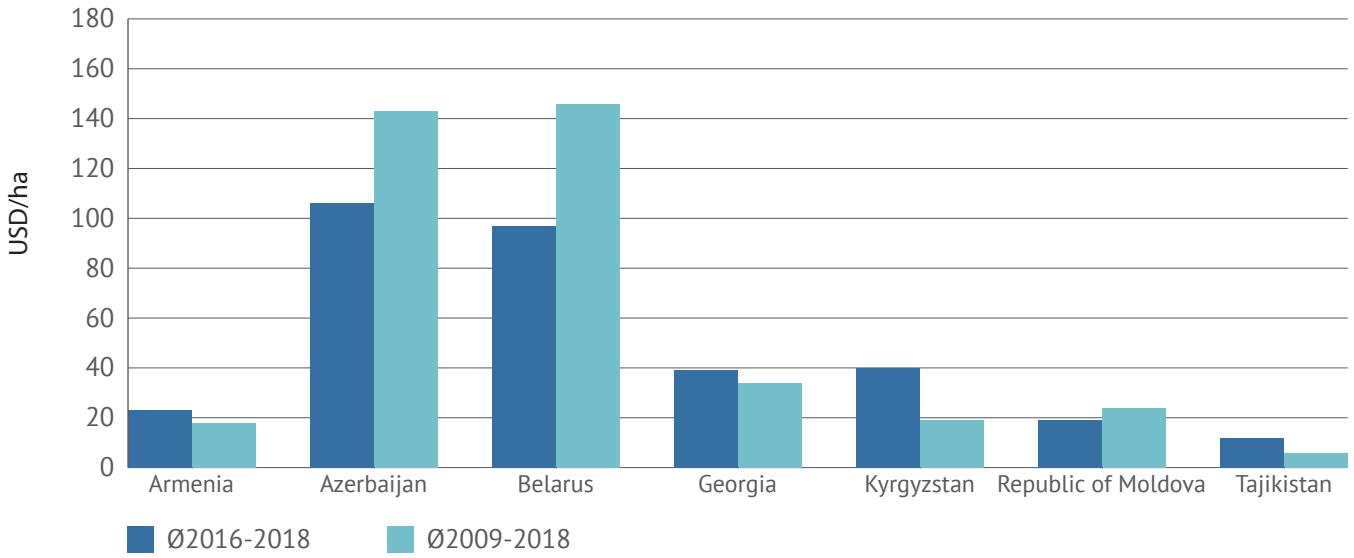
Source: Authors' calculations.

If the analysis is extended to budgetary transfers per hectare of agricultural area, the results are similar (Figure 8). Azerbaijan and Belarus continue to stand out strongly at the higher end of support, with one hectare of agricultural land receiving support of around USD 100 on average during the 2016 to 2018 period. This support in other countries ranged from around USD 10 to USD 40 per hectare. For comparison, total European Union support to agriculture in 2017 was much higher, amounting to approximately USD 500 per hectare and covering almost 20 percent of the volume of production (Erjavec *et al.,* 2020).

[16] *For Tajikistan: Value of agricultural production was not available for 2017 and 2018 when the indicators were calculated.*

[17] *Budget data for Uzbekistan was not collected during the study, therefore the budgetary and other transfers to agriculture could not be analysed. Country abbreviations in the figures in this chapter: Armenia – AM; Azerbaijan – AZ; Belarus – BY; Georgia – GE; Kyrgyzstan – KY; Republic of Moldova – MD; Tajikistan – TJ; Uzbekistan – UZ.*

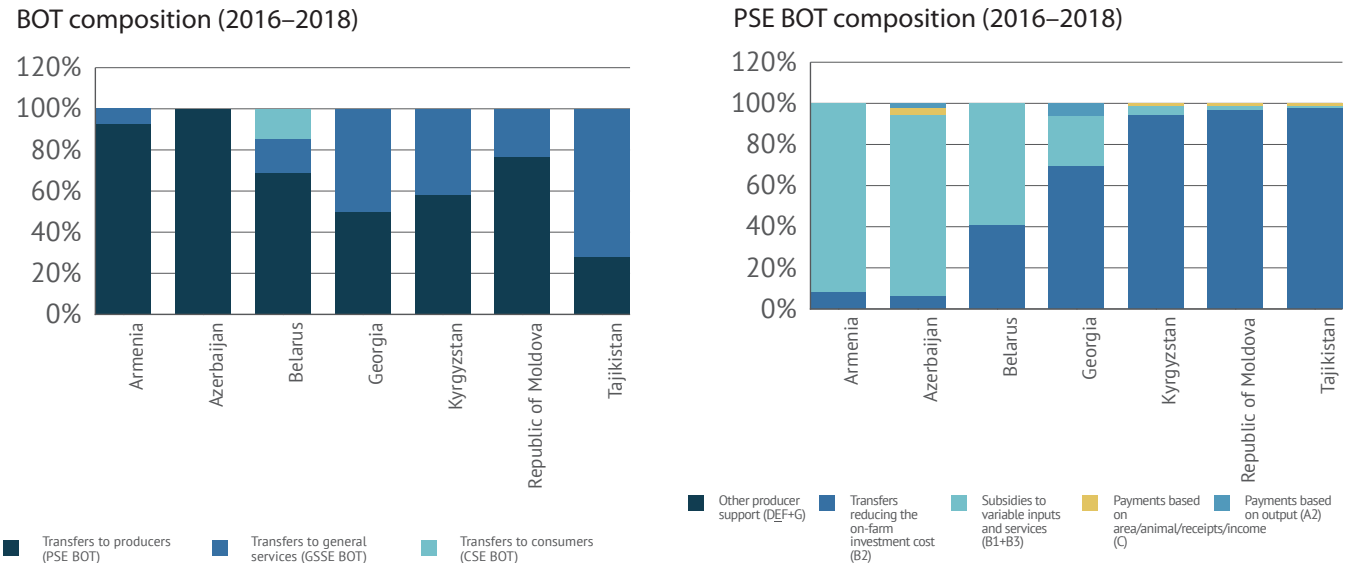
Figure 8. Budgetary and other transfers to agriculture calculated per hectare of agricultural area (USD/ha)[18]



Source: Authors' calculations.

Transfers to individual agricultural producers (PSE BOT) dominate total support in almost all countries (Figure 9). Considering all analysed countries together, around 77 percent of the total support was provided to individual agricultural producers, amounting to USD 1.25 billion per year on average in 2016–2018. General services generally constitute a relatively small share in the total BOT. As an exception to this, support for general services is relatively high in Tajikistan, where it accounted for 65 percent of all transfers during 2016–2018. This share is also high in Georgia and Kyrgyzstan, where GSSE BOT accounted for almost half of all transfers in the same period.

Figure 9. Composition of the total budgetary and other transfers (BOT) by economic group[19] and the composition of transfers to producers by main categories (PSE BOT), average 2016–2018



Source: Authors' calculations.

[18] *Data on hectares of agricultural area: average of the years, for which the data is available.*

[19] *Total BOT composition for Azerbaijan needs to be interpreted with caution as the data was available only for transfers to individual agricultural producers (PSE BOT).*

While large differences in the composition of the total budgetary support to agriculture are observed across countries, the shares of the main categories of transfers to individual agricultural producers are similarly diversified across the countries (Figure 9). Subsidies to variable inputs and services (provided, for example, by subsidizing the purchase of fertilizers or seeds) accounted for about 90 percent or more of transfers to producers in Armenia and Azerbaijan, whereas in Kyrgyzstan, the Republic of Moldova and Tajikistan measures for reducing on-farm investment cost (fixed capital formation, such as the purchase of mechanization equipment and investments in land operation) accounted for around 95 percent. Other types of measures (for example, payments based on output or area) provide a negligible share of support in all countries.

Chapter 4.
Country analysis of agricultural price distortions and budgetary transfers

4.1 Armenia

Armenia's agricultural sector contributed 12 percent to the country's total GDP in 2019 and employed 30 percent of its workforce, constituting a decrease compared to 39 percent of employment in 2009 (World Bank, 2020). Armenia can be characterized as a liberal and open economy, with low levels of agricultural policy support until recently (FAO, 2017) when it joined the EAEU. Before joining the EAEU, Armenia had zero or very low import duties on agricultural products. The country is now slowly increasing tariffs for products imported from non-EAEU countries to match the external tariff of the EAEU.

Real gross agricultural output[20] in Armenia grew at a compound annual growth rate of 1 percent over the 2005–2018 period. At the same time, agrifood trade[21] grew at a much higher compound annual growth rate of 9 percent, in real terms. While both agrifood imports and exports increased during the analysed period, Armenia was on average a net importer of agrifood products over the 2005–2018 period (FAO, 2020).

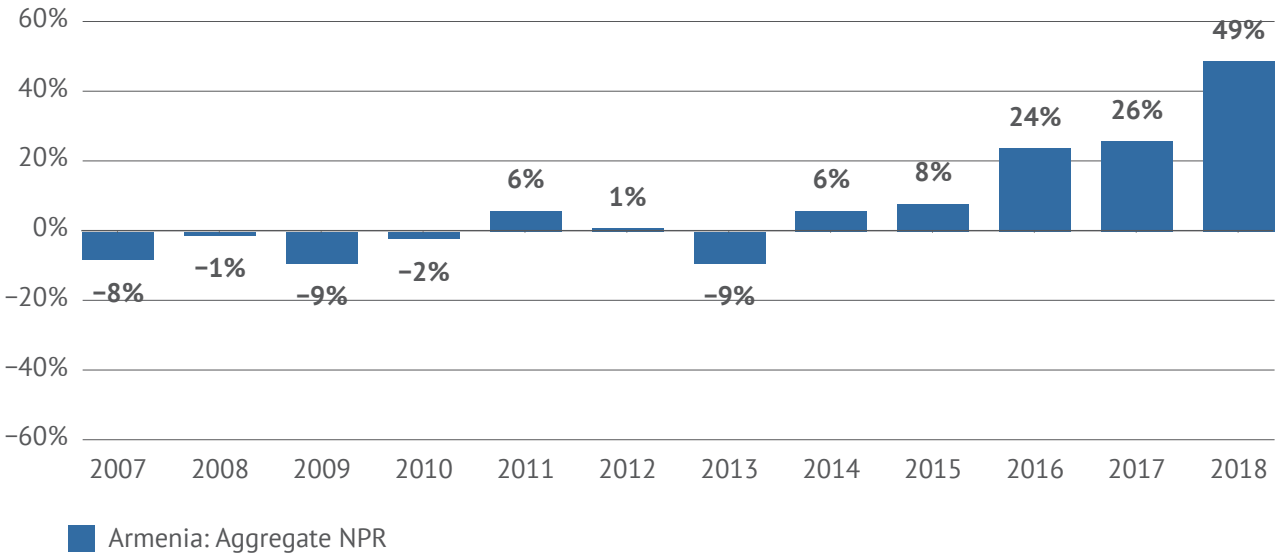
In the latest five-year period with available data (2015–2019), Armenia was a net importer of wheat, milk, pig meat, bovine meat, potatoes and apples, and a net exporter of tomatoes, grapes and apricots. During this period, on average 97 percent of Armenian imports of wheat by value were sourced from the Russian Federation. Dependency on the Russian market is also reflected in Armenia's exports: Tomatoes (the most important commodity in terms of export value in recent years), apricots and grapes were almost exclusively exported to the Russian Federation. More than half of all bovine meat was imported from India and almost a third from Ukraine, while more than three quarters of pig meat were imported from Brazil. On average, around one quarter of imports of milk and dairy products originated from New Zealand, another quarter from Ukraine, and around 15 percent from Belarus (UN Comtrade, 2020).

4.1.1 Nominal Rates of Protection

At the aggregate level, the results indicate considerable price incentives for agricultural producers in Armenia in the period 2014–2018, with NRPs gradually increasing from 6 percent in 2014 to 49 percent in 2018 (Figure 10). Prior to that, in the period 2005-2013, aggregate NRPs were predominantly negative, indicative of price disincentives for agricultural producers. Exchange rates fluctuations in Armenia, for example the rapid appreciation of the national currency vis-à-vis the Russian ruble in 2014/15, contributed to the increasing NRPs from 2014, in addition to the overall low level of market integration, fragmented land structure and a large share of smallholder farms that are not well integrated into markets: In Armenia 89 percent of all farms are smaller than 3 hectares in size (FAO, 2020).

[20] *Measured in constant prices of 2014–2016.*
[21] *Measured in 2015 prices.*

Figure 10. Armenia: Average aggregate nominal rate of protection at farm gate (percent, weighted average),[a] 2007–2018



[a] *Commodities include apples, apricots, bovine meat, milk, pig meat, tomatoes and wheat.*

Source: Authors' calculations.

Armenia's NRPs by commodity are shown in Figure 11. For wheat, apples, apricots, bovine meat, pig meat and milk, the positive NRPs indicate that in the analysed period (2007–2018), domestic producer prices for these commodities were substantially above the comparable reference prices for most years.

Looking at the potential drivers of price incentives for producers of the above-mentioned commodities, a 20 percent value-added tax (VAT) is applied to imported wheat, most of which is sourced from the Russian Federation. While local producers cannot compete with the imported wheat (that is often considered to be of better quality), the mills often match the price paid to local farmers to the price paid on imported wheat at the point of delivery at the mills.

Given that wheat in Armenia is one of the commodities for which commodity-specific budgetary measures could be identified, NRAs for wheat are shown in Figure 11. Since NRAs reflect additional incentives that wheat producers in Armenia received, these provide a more complete picture of price incentives and disincentives compared to NRPs. However, this indicator is only slightly higher than the NRPs and only in the 2010-2013 period, which is attributed to a programme implemented to distribute high quality seeds.

The effect of recent tariff increases for meat and milk, resulting from the alignment of Armenia's tariff schedule with the EAEU, appear to be reflected in the increase of NRPs in 2018.

Over the last decade, tomatoes have become one of Armenia's most important agricultural commodities in terms of export value and the country's only key commodity receiving price disincentives throughout the entire period. While smaller producers sell at the local wholesale market and have no storage infrastructure, the bulk of exports comes from large producers that export straight from their greenhouses or sell to supermarkets. One possible explanation for the negative price incentives for tomatoes could be the highly competitive production conditions. The production costs in Armenia are low due to favorable climatic conditions and lower input costs, while yields remain low (Urutyan, Yeritsyan and Mnatsakanyan, 2015).

The NRPs for apricots fluctuate over the analysed period, which can partially be explained by the variations in annual production volumes due to weather conditions (such as in 2010), by the fluctuations in demand in Armenia's main export destination – the Russian Federation – as well as in exchange rate fluctuations (such as the currency appreciation against the Russian ruble in 2014/15).

Figure 11. Armenia: Nominal Rates of Protection and Nominal Rate of Assistance by key commodities (percent), and prices of potatoes and grapes at farm gate (USD/tonne), 2005–2019[a]

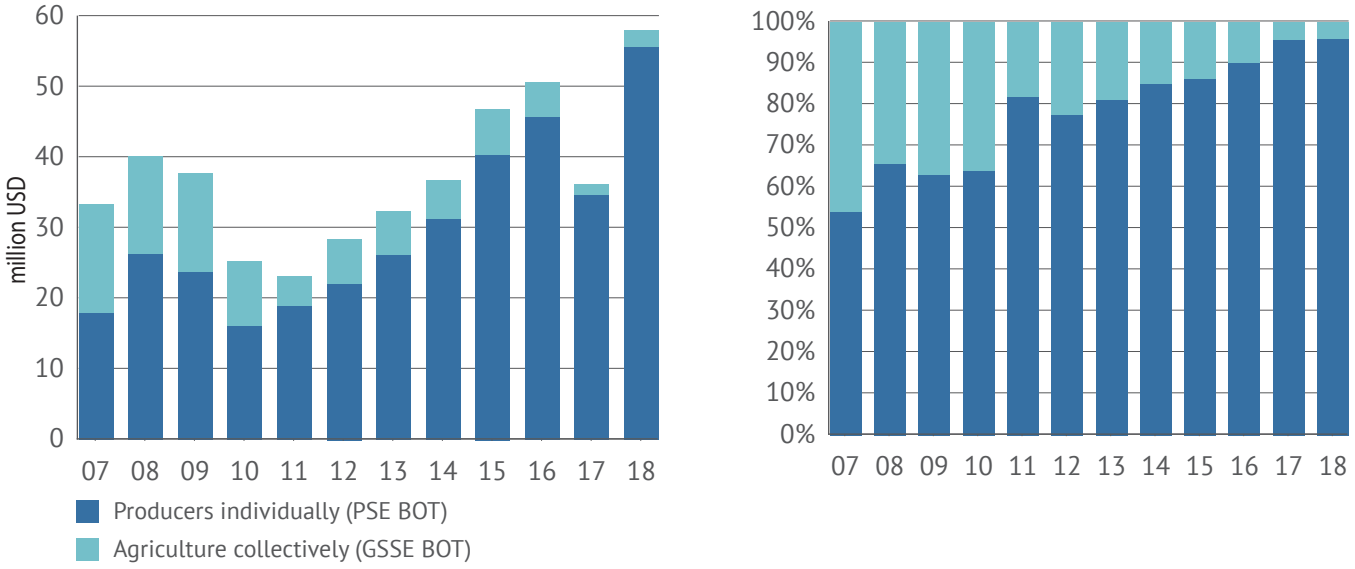
[a] *Due to the low tradability of potatoes, which are typically produced by smaller farms for self-consumption and are not market-oriented, NRPs are not shown in this graph. For grapes, besides being a thinly traded commodity, there have been issues with the comparability of producer and reference prices.*

Source: Authors' calculations.

4.1.2 Budgetary transfers

In Armenia, the absolute level of budgetary transfers to agriculture has been increasing since 2011, with the only exception in 2017 (when some measures were discontinued) (Figure 12). Total budgetary support reached USD 58.1 million in 2018, of which about USD 55.7 million (96 percent) were intended for producer support and USD 2.4 million (4 percent) for the financing of general services in agriculture. The share of budgetary transfers to individual producers has been increasing steadily throughout the entire 2007-2018 period. There was no budgetary support to consumers in Armenia. On average over the last three-year period (2016–2018), the total budgetary support to agriculture (total BOT) was equivalent to 2.6 percent of the value of agricultural production. The budget allocation to agriculture is relatively low compared to other analysed countries.

Figure 12. Armenia: Budgetary and other transfers to agriculture by economic group of beneficiaries, 2007–2018



Source: Authors' calculations.

Agricultural producers receive support through the subsidization of irrigation costs by cubic meter of water. Arable land is very limited in Armenia and requires irrigation for an adequate yield (ICARE, 2012), which us provided through a subsidy. Since 2012, agricultural producers have also received support through the provision of mineral fertilizers and diesel fuel at reduced prices. Until 2013 and from 2018 onwards, the government provided support to purchase of seeds for all crops, and separate support specifically for wheat producers (such as the provision of elite wheat seeds between 2010 and 2013). In the 2007–2009 period, some budgetary support was given in the form of per hectare payments aimed at bringing non-utilized agricultural land back into cultivation.

Under general service support, the largest share of budgetary funds was spent on inspection and control measures (such as the financing of veterinary and anti-epidemic activities, plant protection, food safety and sanitary services) and knowledge generation and transfer measures (such as animal breeding and seed varieties improvement, education and extension services). In 2018, these two categories of support captured 93 percent of the total general service support. The remaining 7 percent of funds were earmarked for infrastructure services targeting improvement and maintenance of agricultural land. Support to agriculture is provided through the programmes managed by the Ministry of Agriculture, other government agencies and through cooperation with international organizations (such as The International Fund for Agricultural Development – IFAD, the World Bank Group and FAO).

4.2 Azerbaijan

In Azerbaijan, the share of employment in the agricultural sector is very high at 36 percent in 2019, while the sector contributed 5.7 percent to the GDP (World Bank, 2020). Azerbaijan has made significant progress toward transformation to a market-based economy. At the same time, some reform initiatives are unfinished, and structural inefficiencies are slowing down long-term growth. This applies particularly to sectors not related to oil, which Azerbaijan's economy is highly dependent on (Aksoy *et al.,* 2017).

Real gross agricultural output[22] in Azerbaijan grew at a compound annual growth rate of 2 percent during the 2005–2018 period. At the same time, real agrifood trade[23] grew at higher rate of 7 percent. Azerbaijan was a net importer of agrifood products throughout the analysed period (FAOSTAT, 2020).

With regard to specific commodities, Azerbaijan was a net importer of wheat, potatoes, bovine meat, poultry meat and milk in the 2015–2019 period, and a net exporter of hazelnuts, tomatoes, persimmons and cotton. Azerbaijan's main trading partner for most of the

[22] *Measured in constant 2014–2016 prices.*
[23] *Measured in 2015 prices.*

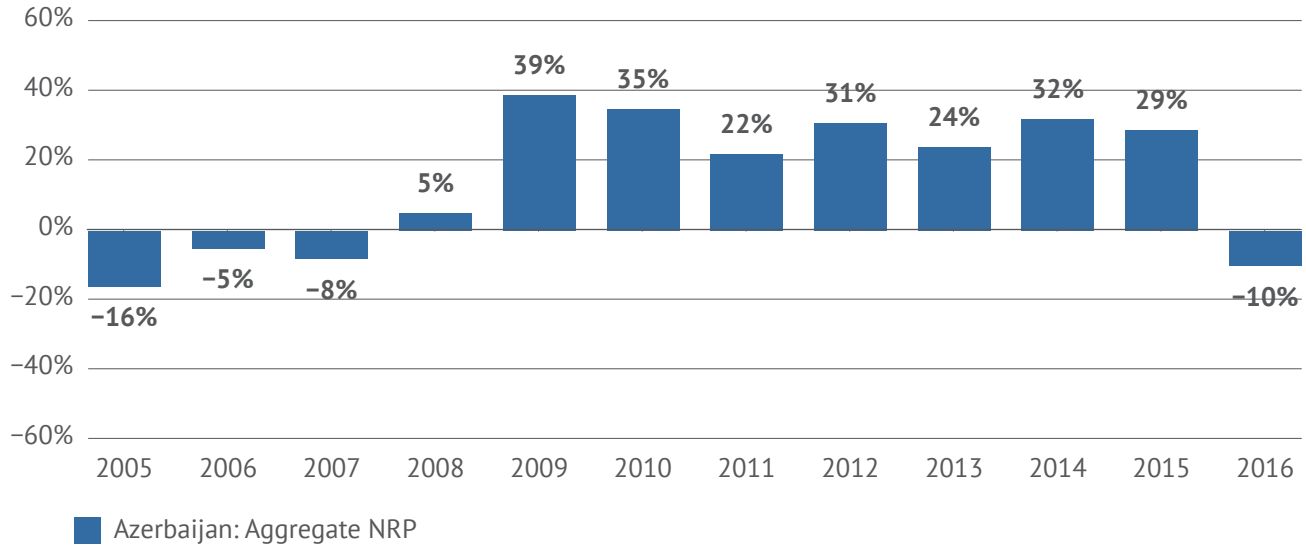
analysed commodities is the Russian Federation. On average during 2015–2019, around 87 percent of wheat imports originated from the Russian Federation, while most imported meat originated from Ukraine (with shares for bovine meat of 72 percent and poultry meat of 60 percent). More than half of the milk and dairy products were imported from three countries: the Russian Federation (27 percent), followed by Ukraine (14 percent) and Belarus (12 percent). Tomatoes, with the highest share among the analysed commodities in terms of export value in recent years, were almost entirely exported to the Russian Federation, as were persimmons. Some 90 percent of cotton was exported to Türkiye. Hazelnuts, another important export commodity for Azerbaijan, were mostly exported to the Russian Federation (35 percent) and the European Union (33 percent) (UN Comtrade, 2020).

4.2.1 Nominal Rates of Protection

Aggregate NRPs for Azerbaijan suggest strong price incentives for agricultural producers between 2009 and 2015 (Figure 13). Azerbaijan is not a member of the WTO or the EAEU, and as such had relatively high levels of border protection, one of the highest among the countries in this study, throughout the analysed period. Other factors that may be contributing to the overall high estimates of NRPs prior to 2015 are the fragmented farm structures, causing limited supply and high production costs, and the increasing purchasing power of the population (Volk *et al.,* 2015), with robust demand pushing up prices to producers.

Before 2008 and in 2016, the average aggregate NRPs were negative, indicating price disincentives for agricultural producers at the aggregate level. While tomatoes and, to a lesser extent, hazelnuts might be driving this result prior to 2008, the decrease of the aggregate NRPs in 2016 could be caused by the lasting effect of the currency devaluation in 2015,[24] which was associated with a drastic decline in global oil prices and Azerbaijan's high dependence on oil exports (see in Mogilevsky, 2017).

Figure 13. Azerbaijan: Average aggregate Nominal Rates of Protection at farm gate (percent, weighted averages),[a] 2005–2016



[a] *Commodities include bovine meat, cotton, hazelnuts, milk, poultry meat, tomatoes and wheat.*
Source: Authors' calculations.

NRPs at the individual commodity level reveal that producer prices were predominantly above the comparable international prices (Figure 14) for wheat, cotton, poultry meat and milk in the 2005–2018 period. For other commodities, such tomatoes and hazelnuts that are exported, the NRPs are more volatile, changing between positive and negative NRPs throughout the period (often negative before 2008 and after 2015). Persimmon and bovine meat producers faced negative NRPs throughout the entire period. The national currency devaluation in 2015 is likely to have contributed to the decrease in the measured NRPs for all selected commodities, except hazelnuts.
For tomatoes, the domestic price are below the reference price only in 2005/06 and 2015/16, while it is above the reference price (and the NRPs are therefore positive) from 2007 until 2014. Import duties increased to USD 0.4 per kg in 2016 (the bound rate had been 15 percent until then), but while this measure was implemented to protect local production, the negative NRPs in the last three years

[24] *Azerbaijan's national currency experienced two major devaluations during 2015 (against the US dollar), and appreciation against the Russian ruble in 2011–2015.*

covered indicate that it may not have been effective.

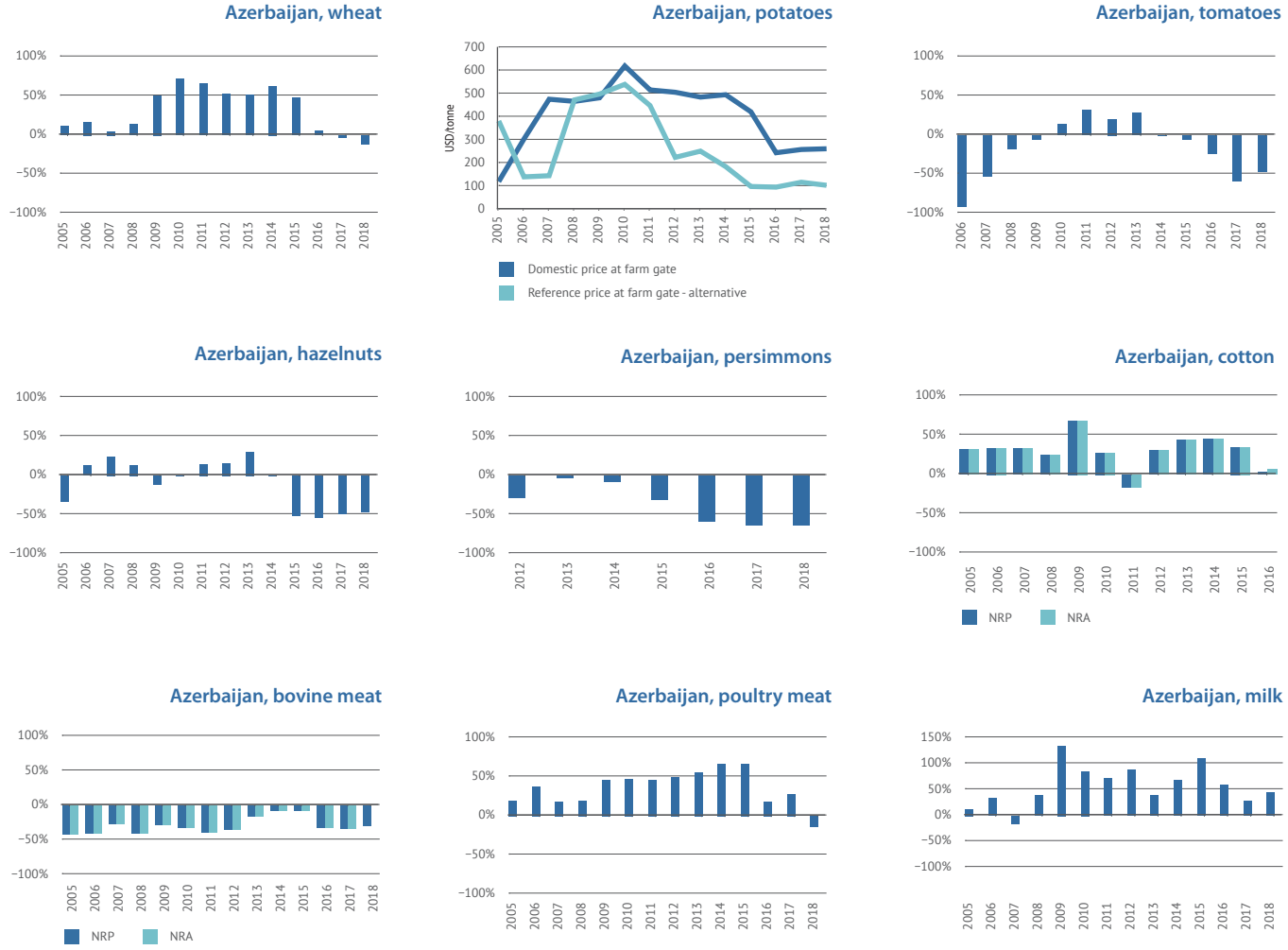
Hazelnut prices are typically very volatile, given that harvests heavily depend on weather conditions and their exports are subject to stringent phytosanitary and food safety rules. Hazelnuts exported from Azerbaijan to the European Union were found to contain aflatoxins above permitted levels in some of the analysed years and could have affected the domestic price.

Persimmons are exported mostly fresh and mainly to the Russian Federation. NRPs are shown only for the 2012–2018 period due to the lack of trade data.[25] The appreciation of the national currency against the Russian ruble and the depreciation of the Russian ruble, the main trading partner for Azerbaijan ′s persimmons, against the US dollar are presumed to be contributing to the negative NRPs.

The NRPs for cotton are positive and high for most years. Rather than the effect of policies, it could be the result of cotton farmers in Azerbaijan facing poor irrigation infrastructure, unreliable access to machinery and labour shortages during harvesting (Prikhodko *et al.,* 2019), keeping the domestic prices high. More in-depth analysis of the cotton value chain would be needed to identify the exact drivers.

The NRPs for wheat were also positive and high during the 2009–2015 period. In 2010, wheat production fell by around 40 percent (primarily caused by flooding) compared to 2009, dropping 20 percent below the longer term average of the 2005–2009 period. This resulted in higher domestic prices relative to the reference price, which was still the case during the subsequent years. The high NRPs are most likely not the result of trade protection (as no such measures were reported), but driven by a combination of other factors, such as the fluctuation of exchange rates (Hasanov and Huseynov, 2009), e.g. the depreciation against the US dollar in 2015, and higher production costs due to a fragmented farm structure (Volk *et al.,* 2015).

Figure 14. Azerbaijan: Nominal Rates of Protection and Nominal Rate of Assistance by key commodities (percent), and prices of potatoes at farm gate (USD/tonne), 2005–2018[a]



[a] *Due to low tradability of potatoes, which are typically produced by smaller farms for self-consumption and are not market-oriented, the NRPs are not shown in this graph.*

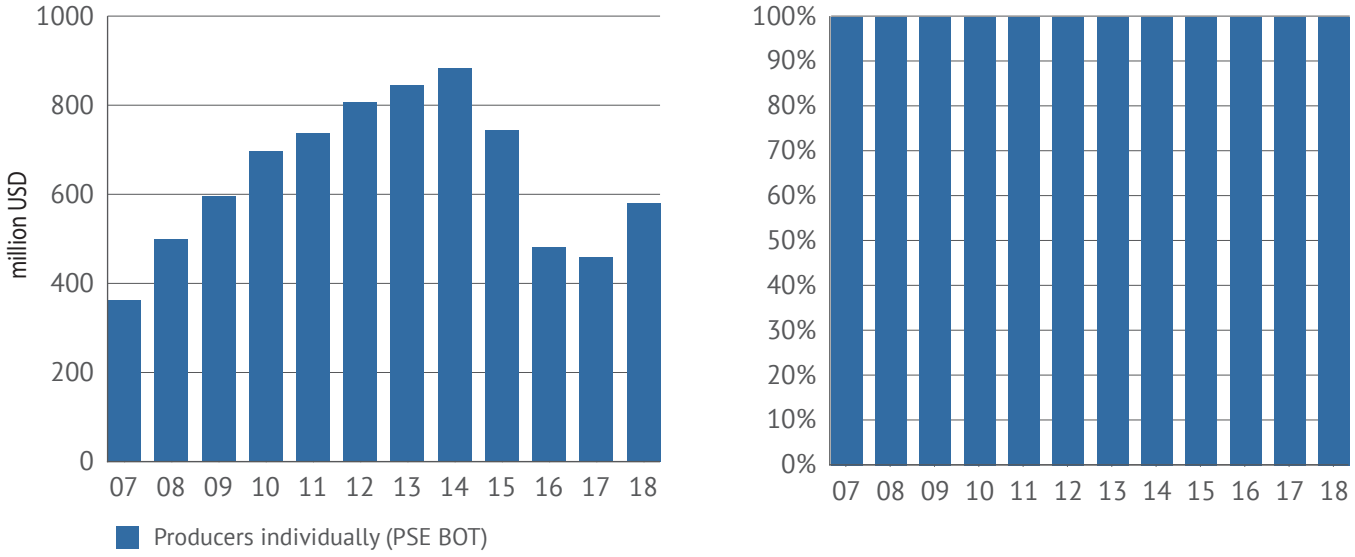
Source: Authors' calculations.

[25] *The HS code for persimmons in the UN Comtrade database has been in use only since 2012.*

4.2.2 Budgetary transfers

For Azerbaijan, data on budgetary support to agriculture is available only for a limited number of producer support measures. From 2007 until 2014, direct support to producers was increasing, but dropped significantly after 2014 due to the impact of monetary policy changes (such as the devaluation of the national currency) (Figure 15). In 2018, budgetary support amounted to USD 579.5 million. About 82 percent of these payments were provided in the form of input subsidies related to specific variable inputs and 11 percent as transfers that reduced on-farm investment costs (leasing machinery and equipment at a discounted price). The rest was granted in the form of area payments (3 percent) and in the form of output payments (3 percent). The total budgetary support to agricultural producers in Azerbaijan represented on average around 13 percent of the total value of agricultural production in the 2016–2018 period (11 percent in 2018).[26]

Figure 15. Azerbaijan: Budgetary and other transfers to producers, 2007–2018



Source: Authors' calculations.

Tax concessions (covering almost 40 percent of the total BOT) are very important instruments used to support agriculture in Azerbaijan. Agricultural producers are exempt from all taxes, except the land tax. Other measures for reducing variable input costs of agricultural production are subsidies for irrigation (with a reduced price for water), fertilizers (discount of 70 percent since 2014; 50 percent in the 2007–2013 period), animal purchases (such as a 50 percent discount on purchases of imported breeder animals), and purchases of pesticides, seeds, fuel and motor oil.

Besides the measures that reduce the cost of inputs to farmers, investment support measures are applied in the form of discounted and subsidized credits for the purchase of agricultural machinery and equipment.

Furthermore, support for sowing wheat and rice and support for the procurement of seeds and young plants are important forms of support for agricultural producers in Azerbaijan. There are some new measures in the form of payments per output for raw cotton, silkworms, sugar beet and tobacco. Azerbaijan's agricultural policy is evolving to place more emphasis on output payments.

[26] *In this study, it was not possible to obtain the budgetary data on GSSE measures for Azerbaijan, but these types of services are also implemented in the country; e.g. the Phytosanitary control service and State veterinary service are established under the Ministry of Agriculture (for more information, see Khalilov, Shalbuzov and Huseyn, 2015). Therefore, the level of support (PSE BOT and GSSE BOT) is actually higher than reported in this study.*

4.3 Belarus

Agriculture contributed 6.8 percent to the total GDP of Belarus in 2019, with 11 percent of the employed population working in the agricultural sector. The contribution to GDP and the share of employment has not changed much over the past decade, remaining roughly at the same level as in 2009 (World Bank, 2020). Market price controls have been applied in agricultural markets in Belarus, which remain heavily managed by the state since the dissolution of the Soviet Union (Volk *et al.,* 2015).

Belarus's real gross agricultural output[27] grew at a compound annual growth rate of 1 percent in the 2005–2018 period. During the same period, real agrifood foreign trade[28] grew at a much higher compound annual growth rate of 8 percent. Belarus was a net exporter of agrifood products in most of the analysed years (FAOSTAT, 2020).

On average, Belarus was a net importer of apples, maize, pig meat and wheat during 2014–2018, while net exports of bovine meat, eggs, milk, potatoes and poultry meat[29] were positive. The Russian Federation is Belarus's main trading partner in terms of trade value. The majority of wheat (89 percent) was imported from the Russian Federation, whereas maize was imported mostly from Ukraine (32 percent), the Russian Federation (20 percent) and the Republic of Moldova (12 percent). Almost two-thirds of imported apples originate from the European Union, while pig meat is imported from the Russian Federation (29 percent), Ukraine (20 percent), the European Union (12 percent) and the Republic of Moldova (10 percent). By far, the most important commodity for Belarus in terms of export value is milk and dairy products. While Belarus is one of the world's largest exporters of dairy, 93 percent is exported to the Russian Federation. Similarly, bovine meat (84 percent), poultry meat (94 percent) and eggs (98 percent) are mostly shipped to the Russian Federation (UN Comtrade, 2020). Exports in Belarus are characterized by strong government involvement.

4.3.1 Nominal Rates of Protection

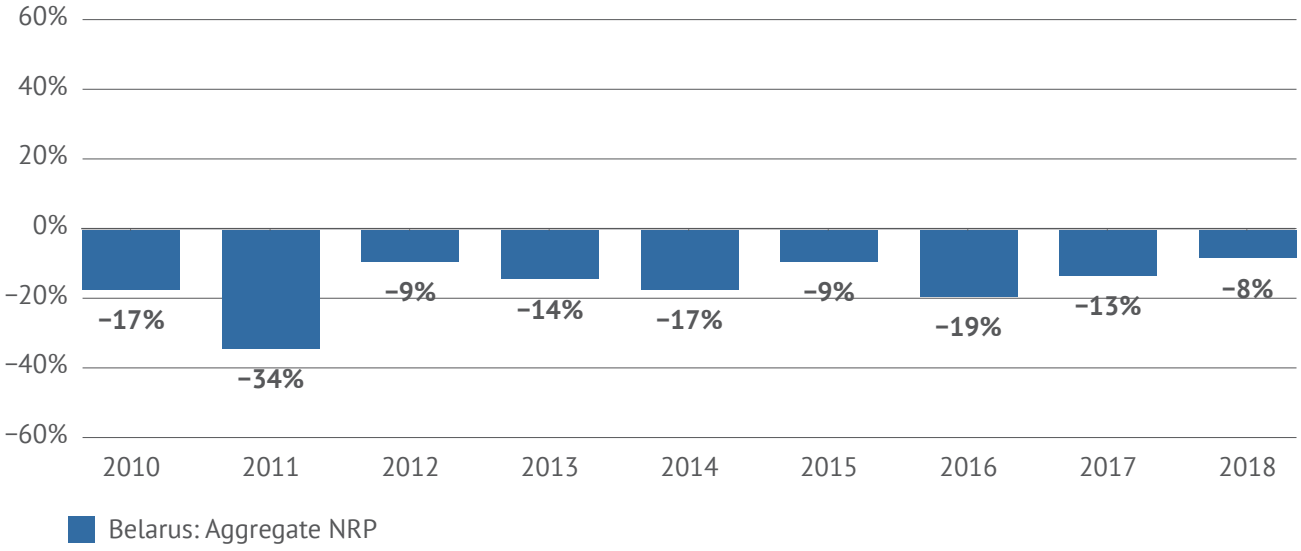
Since the collapse of the Soviet Union, Belarus has preserved some of the features of the former economic system, with a significant level of state intervention in agricultural markets, for example through administered prices on agricultural commodities. For some products, domestic prices have been artificially kept at low levels to ensure affordable food prices for domestic consumers, which results in a negative price gap when compared producer prices are compared with reference prices at the farm gate (Volk *et al.,* 2015). As a result, the calculated aggregate NRPs are negative, with values ranging from –8 percent to –34 percent between 2010 and 2018, reflecting price disincentives to agricultural producers in Belarus (Figure 16).

For food security purposes, around 30 percent of the annual wheat harvest is purchased through government orders with fixed volumes of cereals for further processing. Each year, maximum purchase prices are set by the Ministry of Agriculture and Food for such government orders.

In addition to market price controls, macroeconomic policies in Belarus related to the national currency (that is, repeated currency devaluations[30]) have affected internal food markets and contributed, in combination with other factors, such as the depreciation in the Russian ruble – to shifts in estimated domestic price distortions.

[27] *Measured in constant 2014–2016 prices.*
[28] *Measured in 2015 prices.*
[29] *Potatoes are a thinly traded commodity due to low average trade intensity and thus this analysis does not calculate NRPs for potatoes.*
[30] *From 1 July 2016, the nominal value of the Belarusian currency was cut by four decimal places: from 10 000 Belarusian rubles to one.*

Figure 16. Belarus: Average aggregate Nominal Rates of Protection at farm gate (percent, weighted averages),[a] 2010–2018



[a] *Commodities include apples, bovine meat, eggs, maize, milk, pig meat, poultry meat and wheat.*

Source: Authors' calculations.

During the 2005–2018 period, domestic producer prices were lower than comparable reference prices for most of the analysed commodities (Figure 17). The NRPs were therefore negative for apples, bovine meat, poultry meat and wheat, and after 2012 also predominantly negative for pig meat and milk. Only for maize and eggs were the NRPs positive and high. The analysis of budgetary support shows that agricultural producers in Belarus are at least partially compensated for the negative price gap (negative NRPs) through relatively high budgetary transfers. It is important to note that the main beneficiaries of these transfers are the large corporate agricultural enterprises that are highly vertically integrated (Volk *et al.,* 2015). Livestock products in particular are produced by large agro holdings – in 2018 these accounted for 98 percent of bovine and poultry meat, 96 percent of milk and 82 percent of eggs.

Few large-scale enterprises dominate the milk market in Belarus, creating an imbalance of market power and impeding the transmission of changes in international prices to domestic prices to producers. This is particularly reflected in the negative NRPs in 2007, 2011 and 2013, when the reference price for milk spiked while the prices to producers remained largely unchanged. In addition, the irregular pattern in the NRPs for milk could be explained by the limitation of raw milk movements within the country itself, which means that dairy producers can only sell their milk to a specific processor in the region. With limited market integration within the country, shocks cannot be absorbed easily, and the mechanism can act as a subsidy to less efficient dairy processors and a tax to more efficient ones (Nivievskyi and von Cramon-Taubadel, 2011). In addition to limited market integration within the country, the bulk of Belarusian cheese and other milk products are exported to the Russian Federation, resulting in strong dependence on one external market and downward pressure on domestic prices of dairy products due to unbalanced market power. Fluctuations in national currency and the volatility in the markets of key trading partners could be another driver of the NRP levels for milk.

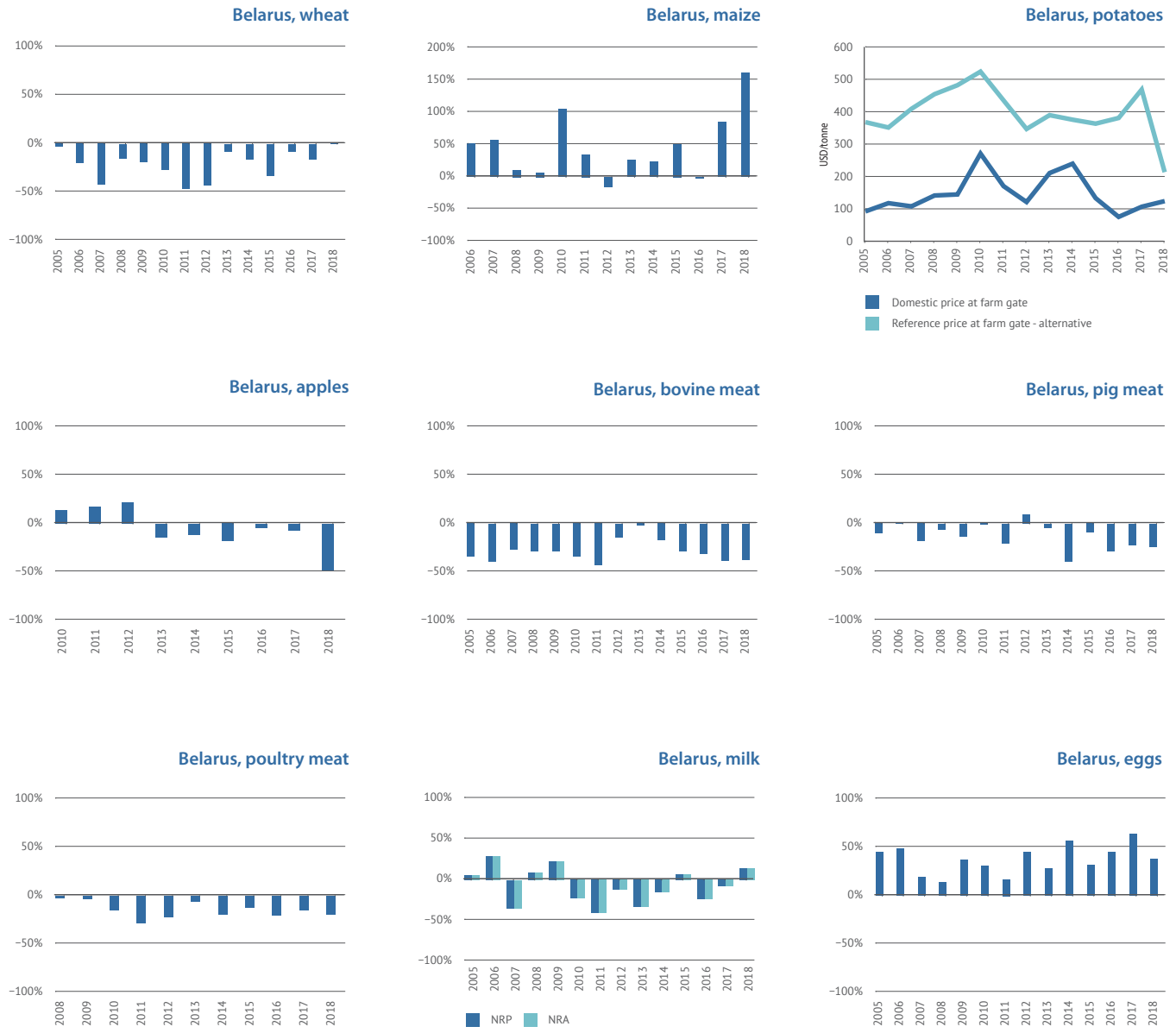
Belarus provided budgetary support to producers of two key commodities analysed in the study: milk and potatoes.[31] However, milk is the only product for which NRAs were calculated for Belarus. The product- specific budgetary support that is accounted for in the milk NRA includes a subsidy that provides full or partial compensation for costs related to milk or feed quality testing in 2011–2013 and 2017–2018. The calculated NRAs are only slightly higher than the NRPs for this product.

[31] *Commodity level support for potatoes was in place in 2012–2013 and 2017–2018 through direct measures for the development of potato production, mainly for the construction and modernization of potato storage facilities. However, as noted before, NRPs and NRAs were not calculated for potatoes due to the limited trade in this product.*

Belarus is a net exporter of eggs. Domestic prices for eggs are higher than the international reference prices, which implies price incentives for domestic producers of eggs. When the price on the international market falls, Belarusian producers of eggs, which are mainly large poultry enterprises in all regions of the country, are still able to sell internationally as they receive domestic support. A simplified taxation system also applies to these producers, which is a single tax of 1 percent of sales proceeds of agrifood goods, and they participate in the governmental programmes for agricultural business development.

Domestic prices of fruits in Belarus are subject to annual fluctuations caused by production volatility. Net apple imports by Belarus are driven by strong demand for apples imported from Poland. These more expensive imported apples find their consumers due to higher quality and year-round supplies, while domestic apple varieties are of lower quality and are not stored for a long time.

Figure 17. Belarus: Nominal Rates of Protection and Nominal Rate of Assistance by key commodities (percent), and prices of potatoes at farm gate (USD/tonne), 2005–2018[a]



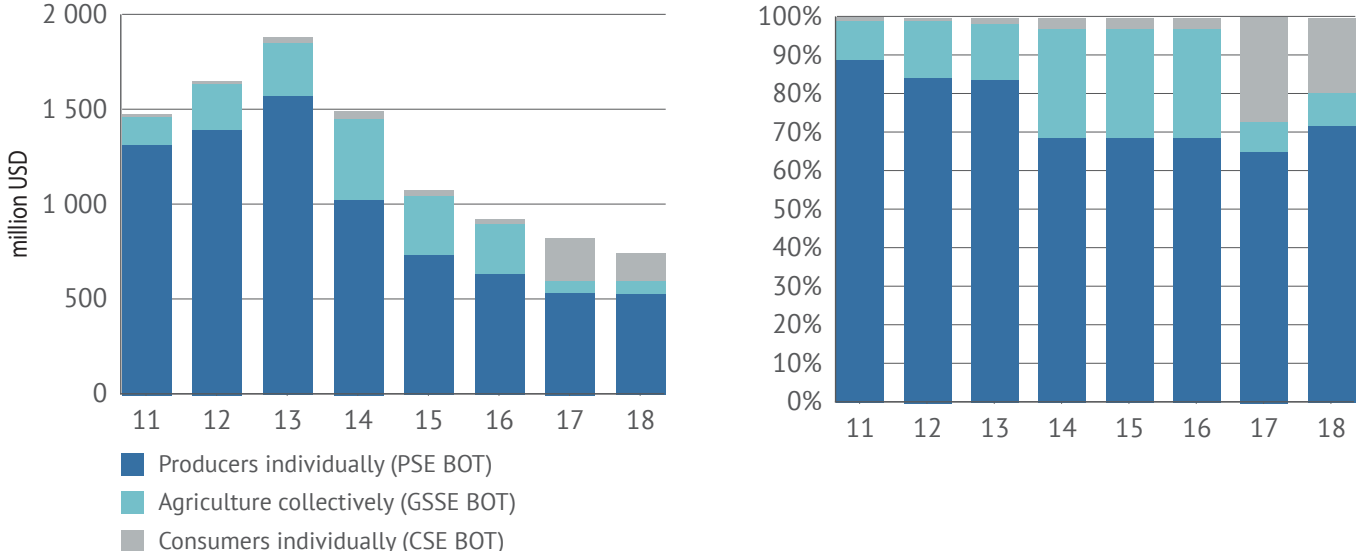
[a] *Due to the low tradability of potatoes, which are typically produced by smaller farms for self-consumption and are not market-oriented, NRPs are not shown in this graph.*

Source: Authors' calculations.

4.3.2 Budgetary transfers

Until 2013 total budgetary transfers to agriculture in Belarus were increasing, with a significant drop was observed from 2014 onwards, mostly as a consequence of currency devaluation and other changes in monetary policy.[32] While total budgetary transfers amounted to USD 1.88 billion in 2013, the amount decreased to USD 748 million by 2018. On average, over the period of the last three available years (from 2016 to 2018), budgetary support to individual agricultural producers in Belarus represented 6.6 percent of the total value of agricultural production, while the total budgetary support to agriculture amounted to 9.6 percent.

Figure 18. Belarus: Budgetary and other transfers to agriculture by economic group of beneficiaries, 2011–2018



Source: Authors' calculations.

From 2014 to 2018 a stable share of around 70 percent of the total BOT is attributed to supporting individual agricultural producers. In the last two years of this analysis (2017 to 2018), there was a decrease in the share of the budget for general services to agriculture and an increase in the share of support to consumers (Figure 18).

Individual transfers to producers in Belarus aim to reduce variable input and service costs and these correspond to around 60 percent of the PSE BOT (USD 330 million in 2018), while expenditures to reduce on-farm investment costs account for around 40 percent of the PSE BOT (USD 208 million in 2018). Belarus is subsidizing several types of input costs, such as expenses for diesel and gas at reduced prices, purchase of fertilizers, insurance premiums, purchase of seeds and repayment of debts and loans, which is a particularly important policy measure. Costs for specific on-farm services are partially or fully compensated directly to agricultural producers. This includes costs for animal disease prevention and control (examinations, vaccinations, etc.), milk or feed quality testing and agrochemical services (sowing tests).

Measures that focus on reducing investment costs for agricultural producers were mostly intended for land operations (such as for the preservation of soil fertility, and conservation and use of reclaimed land), mechanization and the purchase of farm equipment. In 2014–2018, additional support to reduce the costs of acquiring technology equipment, purchasing and leasing of agricultural machinery and equipment (including the repayment of loans), and financing or co-financing of on-farm land activities (liming of acid soils) was implemented. In the 2011–2013 period, more than half of government support for reducing on-farm investment costs was provided in the form of guarantees for bank loans for repairs and maintenance of the farm drainage system and targeted support to potato, vegetable and fruit production.

The level and composition of funds for public services, institutions and infrastructure (general service support to agriculture) vary from year to year, with a significant drop in 2017 and 2018. In 2017 and 2018, this support amounted to around USD 65 million, which is only quarter of the annual average for the whole analysed period. In the 2014–2016 period almost 70 percent of the funds were not allocated

[32] *Monetary values are shown in US dollars, and most study countries' currencies depreciated against the US dollar, and appreciated against the Russian ruble.*

to specific state, regional or sectoral programmes. These are therefore considered under the category 'other general support'. The remaining funds were directed to infrastructure services[33] and to finance vocational training, retraining and skills improvement; public financing of agricultural research; and setting up of the state agricultural information system. In the following years, less than 30 percent fell under the category of non-allocated funds, or general support. At the same time, there was an increase in funding of measures for inspection and control[34] while significantly fewer funds were allocated for infrastructure services in those two years.

In the analysed period, budgetary support targeting consumers consisted of subsidies to flax processing plants, preferential loans for the construction and reconstruction of sugar beet processing plants, and the modernization of milk and meat production and processing facilities. In 2017–2018 many funds have been granted for preferential loans, especially for milk and meat production and processing facilities.

4.4 Georgia

In 2019, about 42 percent of Georgia's workforce was employed in agriculture (49 percent in 2009), and the sector produced close to 6.2 percent of the country's GDP (World Bank, 2020). Georgia is an open economy with predominantly subsistence farming, characterized by small and fragmented farms with low productivity and weak market integration.

Real gross agricultural output in Georgia[35] was decreasing at a compound annual rate of 2.9 percent over the 2005–2018 period. During the same period, real agrifood foreign trade[36] grew at a compound annual growth rate of 7 percent. Both the value of agrifood exports and imports grew from 2005 to 2018. The value of agricultural imports was higher, making Georgia a net importer of agrifood products in the analysed period (FAOSTAT, 2020).

Among the analysed commodities, only hazelnuts registered positive net exports, while all other products had a negative trade balance during the analysed period. Poultry meat was mostly imported from China, Türkiye and Ukraine. More than half of the milk and bovine meat as well as around a third of eggs were imported from Ukraine alone (the rest of the eggs originated from Türkiye and the European Union). Around 80 percent of maize originated from the Russian Federation, while apples were imported mostly from the European Union (28 percent), the Islamic Republic of Iran (23 percent) and Türkiye (25 percent). Grapes were imported from Armenia (32 percent), Uzbekistan (29 percent) and the Islamic Republic of Iran (20 percent). More than half of Georgian hazelnuts were exported to the European Union, around 8 percent to the Russian Federation and the rest to other countries (UN Comtrade, 2020).

4.4.1 Nominal Rates of Protection

The calculated aggregate NRPs for Georgia were positive in most years, ranging from -1 percent to 44 percent in the 2008–2018 period (Figure 19).[37] Georgia maintains a simple trade regime with a generally low level of import protection. Since September 2006, only three levels of tariffs are applied on imports: 0 percent, 5 percent and 12 percent. Georgia does not apply tariff rate quotas on agrifood products. The analysis of NRPs for Georgia was affected by data scarcity. Access costs could not be collected on all products, affecting accuracy of the indicators. Agricultural policy in itself may not be the main driver of the observed price gaps as Georgia exercises only moderate customs protection, while prices are formed freely (Volk *et al.,* 2015).

[33] *Including electricity reticulation, roads and other means of transport, market facilities, water supply facilities, dams and drainage schemes, and infrastructural works associated with environmental programmes.*

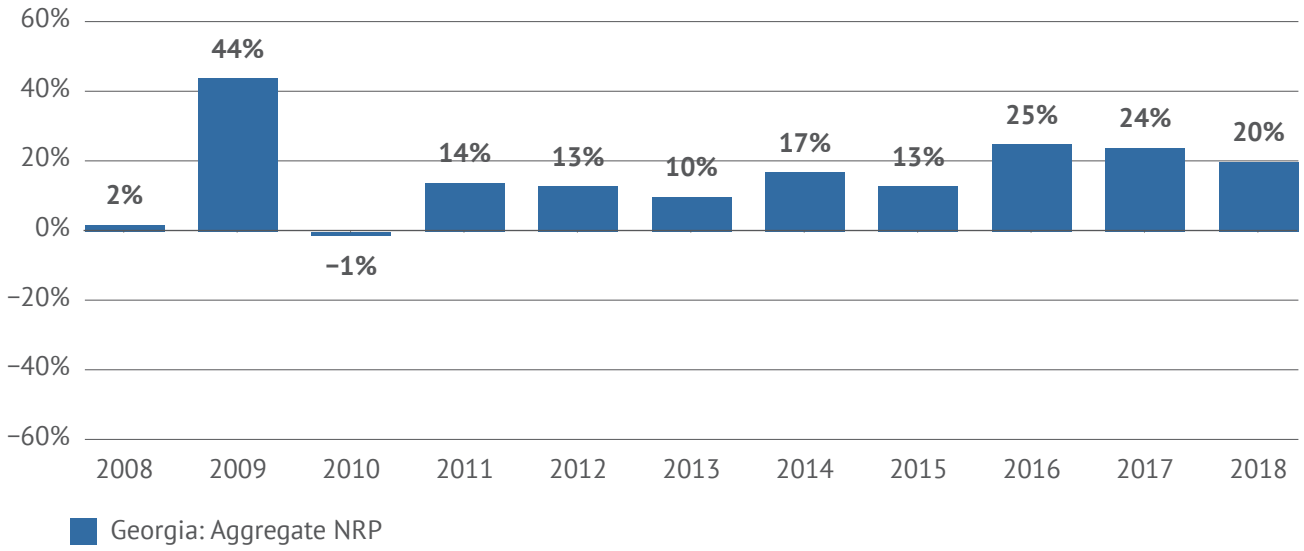
[34] *Public financing of state crop testing laboratories and public financing of all veterinary inspection services and affiliated networks.*

[35] *Measured in constant 2014–2016 prices.*

[36] *Measured in 2015 prices.*

[37] *It should be taken into account that there was a change in the methodology to collect production volume data from 2014 in Georgia. For the 2006–2013 period, the main source of the sample frame of surveys was the 2004 Agricultural Census 2004. The sample frame for the 2014–2019 period has been updated and is based on the 2014 Agricultural Census. Therefore, data for the period 2014–2019 is not comparable to data of the period 2006–2013.*

Figure 19. Georgia: Average aggregate nominal rate of protection at farm gate (percent, weighted average),[a] 2008–2018

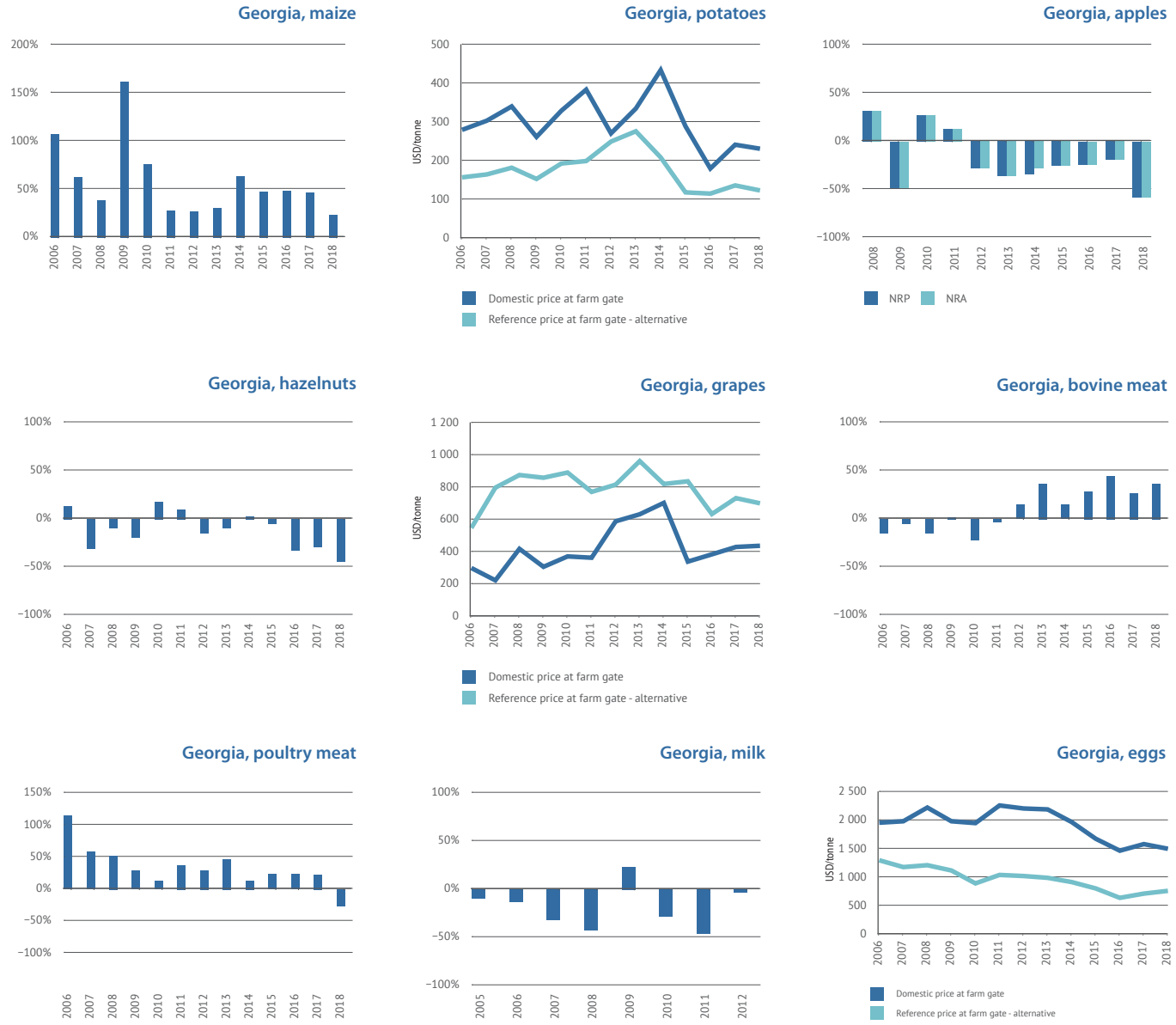


[a] *The commodities include apples, bovine meat, hazelnuts, maize, milk and poultry meat.*

Source: Authors' calculations.

The domestic prices of bovine meat (from 2012), maize, milk and poultry were substantially above the reference prices, indicating price incentives for producers of these commodities during the analysed period (Figure 20). Overall, fragmented land and low productivity of agriculture, weak market integration and low level of adoption of new technologies by farmers, rather than policy interventions, appear to impede the alignment of domestic prices with the international ones, explaining the positive price gaps for several commodities across the period.

Figure 20. Georgia: Nominal Rates of Protection and Nominal Rate of Assistance by key commodities (percent), and prices of potatoes, grapes and eggs at farm gate (USD/tonne), 2006–2018[a]



[a] *Due to the low tradability of eggs, grapes and potatoes, which are typically produced by smaller farms for self-consumption and are not market-oriented, the NRPs are not shown in this graph. For grapes, besides being a thinly traded commodity, there have been issues with comparability of producer and reference prices.*

Source: Authors' calculations.

Hazelnuts are an exception to this, as the hazelnut market is highly dependent on exports markets in terms of demand and prices, which are also influenced also by other regional exporters, such as Azerbaijan and Türkiye. The domestic prices of Georgian hazelnuts are lower than the comparable reference prices over the analysed period, with few exceptions of moderately positive NRPs in 2009–2010 and 2013. Monetary policies influencing the exchange rate are a relevant factor, in addition to inconsistent quality and lack of market distinction of Georgian hazelnuts, which lead to low prices. In the 2015–2018 period, outbreaks of Asian bugs and fungal diseases contributed to low domestic prices.

Georgia has good natural and climatic conditions for fruit production of fruits. However, domestic apple prices were lower than comparable reference prices for most years during the observed period, with exceptions in 2008, 2010 and 2011. In Georgia's context, it is likely that farmers are able to produce at a cost below the international market and can therefore still be profitable. There is a particularly strong drop in NRPs in 2018, which was a year with a significant increase in the volume of domestic apple production, followed by a drop in prices paid to producers.

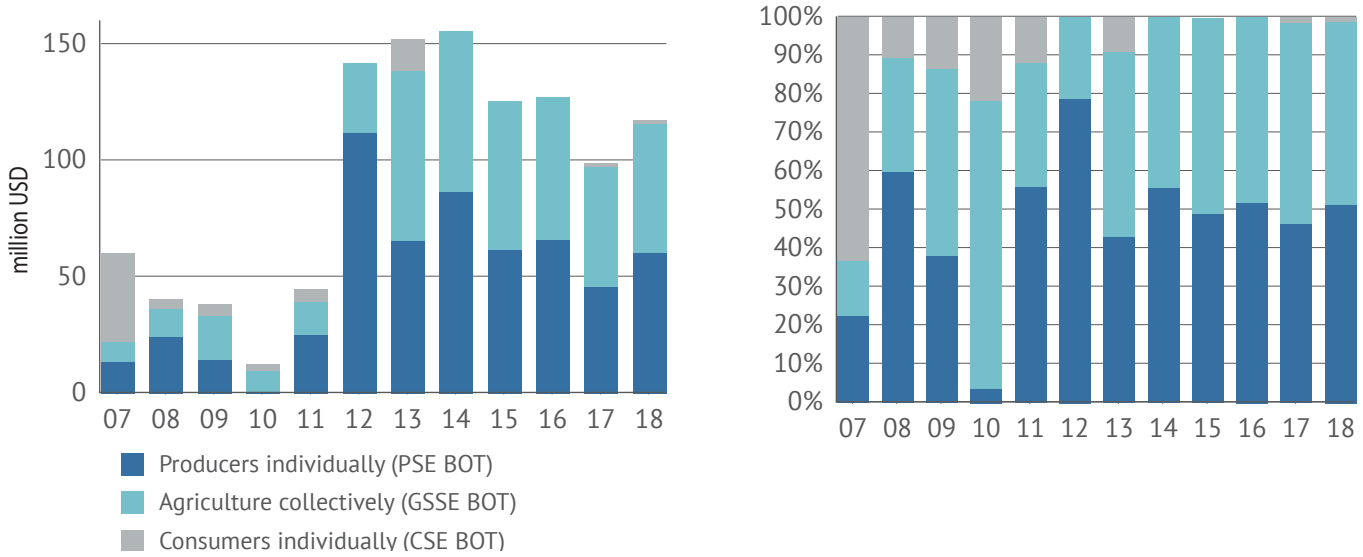
For apples, NRAs were calculated in addition to the NRPs, with a substantive difference between the two indicators in 2014 when a subsidy per kilogram of lower quality apples was implemented. The goal of the project was to increase domestic production and decrease import volumes. Despite this programme, the estimate of the NRA in that year was also negative, though slightly less than the NRP.

Georgia applied budgetary support to producers of other key commodities as well. Support programmes include input subsidies for purchasing elite potato seeds in 2005 and 2009 and various measures benefiting grape production, in particular support to the wine sector in 2007–2016. Producers of grapes benefited from payments for the development of viticulture and winemaking (output payments per kilogram) and other measures targeting the processing of grapes. However, given the low tradability of potatoes and issues with data quality for grapes, NRAs could only be calculated for apples.

4.4.2 Budgetary transfers

In Georgia, the absolute level of budgetary support to agriculture has increased significantly since 2012, when the government declared agricultural development a key priority. At this time, transfers tripled compared to the previous years. In the 2015–2018 period, budgetary support started to decline in dollar terms, which is primarily the consequence of the change in monetary policy, affecting the exchange rate of the national currency against the dollar. In 2018, total budgetary transfers amounted to USD 117.7 million (Figure 21). In the last three-year period (2016–2018), total budgetary support to agriculture in Georgia represented on average 6.4 percent of the total value of agricultural production, which is on average slightly more than in the last ten-year period (5.2 percent).

Figure 21. Georgia: Budgetary and other transfers to agriculture by economic group of beneficiaries, 2007–2018



Source: Authors' calculations.

The composition of the total BOT varied significantly until 2012 and stabilized afterwards with around half of the BOT intended for agricultural producers and another half for general agricultural services. In some years, Georgia also provided support to consumers through indirect benefits, for example, via support to processing plants and storage facilities.

In the last three years in the series (2016 to 2018), half of the total BOT (or USD 57.7 million) was allocated to producers individually (PSE BOT). However, the structure of the budgetary and other transfers to producers varies considerably between the analysed years. In 2015–2016, almost half of support was delivered as subsidies for on-farm investments/fixed capital formation, mostly as preferential agro-credits (low rate or interest-free loans) and reimbursement of leasing fees for agricultural machinery. The share of investment measures was even higher in 2011–2013 and 2017–2018, covering almost 90 percent of the total transfers to agricultural producers, and consisting mainly of preferential credits and grants for agricultural machinery and equipment, co-financing of plantation rehabilitation (such as for Georgian tea) and other payments for land operations (such as for the protection of soil from erosion and irrigation).

The rest of the PSE BOT funds in 2017–2018 were given to reduce variable input costs on farms, in particular by providing subsidized inputs (such as insurance or seeds). In 2015–2016, this support covered 37 percent of the PSE BOT, while in 2017–2018 this share dropped to around 13 percent.

In some years, payments per kilogram of harvested product sold to companies were granted for wine grapes, citrus fruits and apples. In 2015–2016 output payments captured about 16 percent of the total disbursed funds for producer support (the vast majority was for grapes). There was no such support in 2017–2018.

On average, over the 2016–2018 three-year period, almost half of the total BOT (or USD 56.2 million) was allocated to general services support. The majority of it was allocated to the development and maintenance of infrastructure[38] and for inspection and control measures.[39] The funds for specific activities for knowledge generation and transfer increased, particularly in 2017 and 2018, to foster innovation and entrepreneurship, and encourage partnership (especially among youth and women) by facilitating skills development and fostering employment. In 2018, there was also an increase in budget for marketing and promotion of Georgian goods at local and international markets, mostly in the wine sector.

In the 2007–2012 period, budgetary support to consumers was provided by financing processing enterprises (providing an indirect benefit to consumers), mainly in the wine sector. In 2013, support was provided for establishment of new agricultural processing plants or reactivating inactive production. To a lesser extent (around 1 percent of the BOT), consumer support was also allocated in 2017–2018 for stimulating the growth and modernization of processing and warehousing agro-enterprises and for adoption of international standards.

4.5 Kyrgyzstan

The contribution of agriculture, forestry and fishing to Kyrgyzstan's GDP reached 12.1 percent in 2019, dropping from 18.8 percent in the prior decade. Employment in agriculture accounted for 21 percent of the total employment in 2019 (World Bank, 2020).

Real gross agricultural output in Kyrgyzstan[40] grew at a compound annual growth rate of 2 percent over the 2005–2018 period. At the same time, real agrifood foreign trade[41] grew at a compound annual growth rate of 6 percent. Kyrgyzstan was a net importer of agrifood products throughout the entire analysed period. The value of agrifood exports and imports fluctuated, but both grew from 2005 to 2018 (FAOSTAT, 2020).

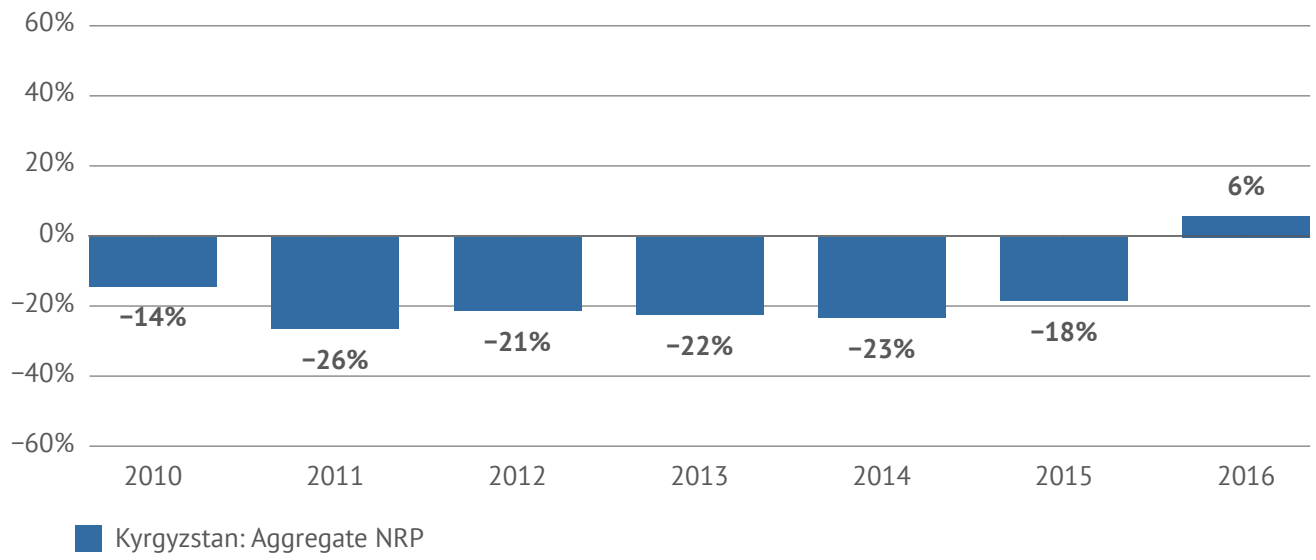
Kyrgyzstan was a net exporter of dry beans, cotton, milk and other products analysed in this report, for most of the observed years. In the last few years from 2014 to 2018, only wheat and bovine meat imports exceeded exports in terms of value. Almost 60 percent of wheat originated from Kazakhstan and the rest was imported from the Russian Federation, whereas almost 40 percent of bovine meat was imported from India, 31 percent from Belarus and 18 percent from Ukraine. On the side of exportable commodities, dry beans are the most important in terms of trade value, followed by cotton and milk. During this period about half of the country's produced beans were shipped to Türkiye, 14 percent to the Russian Federation and 9 percent to European Union member countries. Milk was mostly exported to Kazakhstan (67 percent) and the Russian Federation (26 percent), whereas almost half of the country's cotton was exported to the Russian Federation and 39 percent to Türkiye. A commodity with great export potential for Kyrgyzstan is honey. In the 2014 to 2018 period, around 40 percent was exported to China, 20 percent to Kazakhstan, 8 percent to the Russian Federation and the rest to other countries (UN Comtrade, 2020).

[38] *Mostly for the modernization and maintenance of irrigation systems and programmes for storage and other rural physical infrastructure.*
[39] *Phytosanitary security, veterinary services and the food safety programme.*
[40] *Measured in constant 2014–2016 prices.*
[41] *Measured in 2015 prices.*

4.5.1 Nominal Rates of Protection

At the aggregate level, negative NRPs between 2010 and 2015 indicate price disincentives for agricultural producers in Kyrgyzstan, driven primarily by lower producer prices for milk and cotton than the corresponding reference prices for these products (Figure 22). The negative aggregate NRPs in that period range from -14 percent to -26 percent, however the aggregate NRP was positive in 2016 at 6 percent, driven to a large extent by increased domestic prices of bovine meat that year. In the absence of export restrictions and any other policies that could reduce producer prices directly, the negative aggregate NRPs in Kyrgyzstan are likely driven by weak market integration and uneven distribution of market power along the analysed value chains, in the dairy sector in particular.

Figure 22. Kyrgyzstan: Average aggregate nominal rate of protection at farm gate (percent, weighted average),[a] 2010–2016



[a] *The commodities include bovine meat, cotton, dry beans, honey, milk and wheat.*

Source: Authors' calculations.

For wheat, dry beans, bovine meat and honey, the commodity-level results indicate that the domestic prices were mostly above the comparable reference prices in international markets (Figure 23). Wheat is generally produced by small-scale farmers, which have higher production costs. At the same time, cheaper wheat is imported, mainly from Kazakhstan. Other drivers of the movements in NRPs include fluctuations in the national currency's exchange rates against the currencies of key trade and economic partners: the Russian Federation and Kazakhstan (FAO, 2016; Mogilevsky, 2017). In addition, Kyrgyzstan started a process of aligning its import tariffs with EAEU tariffs since its accession in 2015, leading to an increase in tariffs, and therefore domestic prices, for a number of commodities.

Due to the increased global import demand for beans that followed a shortage in the world market in 2013 (caused by yield-damaging climate conditions in Argentina and Türkiye, political instability in Egypt, and decreasing areas cultivated with beans in China), Kyrgyzstan was able to increase its domestic production and exports in the subsequent years. The domestic prices decreased in 2015, due to an increase in supply from China and South America (Tilekeyev *et al.,* 2018).

Figure 23. Kyrgyzstan: Nominal Rates of Protection by key commodities (percent), and prices of potatoes and sheep meat at farm gate (USD/tonne), 2005–2019[a]

[a] *Due to the low tradability of potatoes and sheep meat, which are typically produced by smaller farms for self-consumption and are not market-oriented, the NRPs for these products are not shown in this graph.*

Source: Authors' calculations.

NRPs for cotton are negative through the entire 2010–2017 period, which is in line with earlier findings by Christensen and Promfret (2008). The main driver behind this may be the market power of intermediaries, such as ginners, vis-à-vis producers.

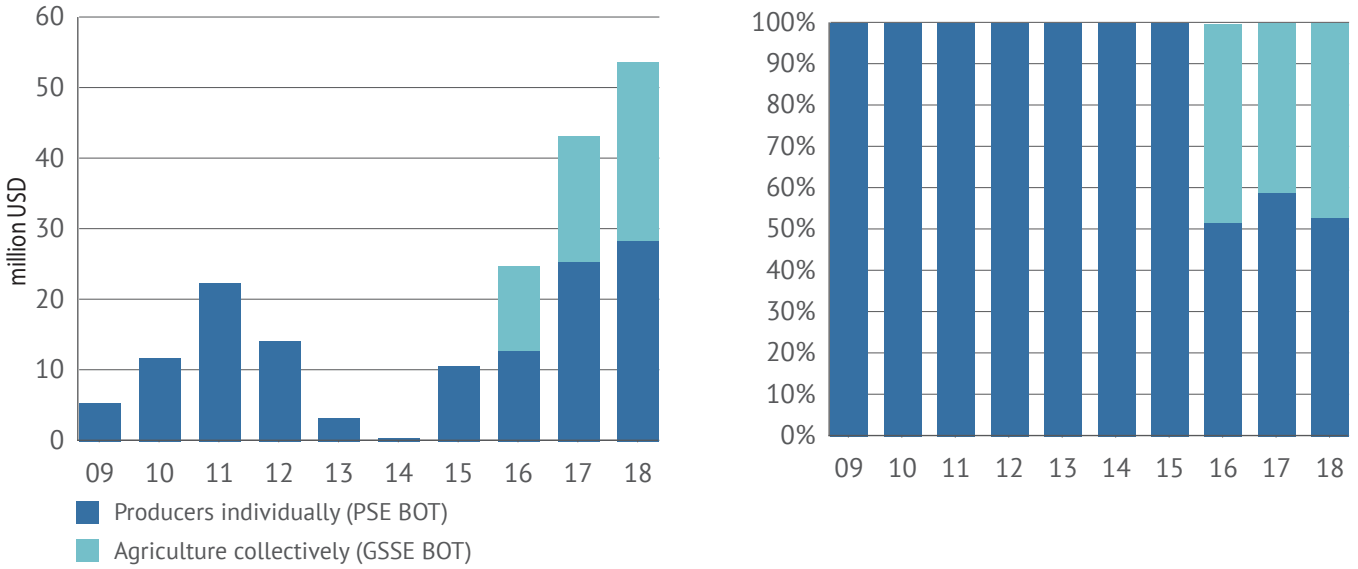
The negative NRPs for milk indicate that dairy producers in Kyrgyzstan receive lower prices than comparable reference prices in international markets. However, there are large differences in farm-gate prices received by small and large dairy producers, and they differ greatly in terms of their outlets and market power. While smaller producers dominate the domestic market, they also tend to have issues with milk quality and safety and receive lower prices for that reason.

4.5.2 Budgetary and other transfers to agriculture

The total volume of agricultural support in Kyrgyzstan varied considerably from 2009 to 2018, peaking in 2018 at USD 53.8 million. In Kyrgyzstan, the scope of agricultural policies changed rapidly during the observed period. Before 2016, transfers to producers prevailed and in the following years, new general service support measures were introduced, causing an increase in the total agricultural support in

2016–2018, while transfers to producers also continued to increase. Between 2016 and 2018, the total budgetary support to agriculture in Kyrgyzstan represented on average 1.4 percent of the total value of agricultural production in the 2016–2018 period (1.9 percent in 2018).

Figure 24. Kyrgyzstan: Budgetary and other transfers to agriculture by economic group of beneficiaries, 2009–2018



Source: Authors' calculations.

Measures for reducing on-farm investment costs/fixed capital formation were the most common form of transfers. To support investments on farms, the main instrument applied by the government was the provision of loans to agricultural producers at interest rates below market rates and the repayment of loans for purchases of machinery and equipment. Payments for irrigation infrastructure, which include maintenance, technical operation and general repair of state irrigation facilities, is another important form of support to agriculture in Kyrgyzstan. The government also implements measures for reducing variable input costs on farms, in the form of subsidies for the purchase of seeds, fertilizers, petroleum products, fuel oil, lubricants and gasoline. In some years, producers received payments as compensation for crop losses incurred from natural disasters, such as mudflow, and the spread of pests such as locusts and American white butterflies.

Between 2016 and 2018, around 45 percent of the total BOT on average (USD 18 million per year) has been allocated for general services to agriculture, mainly for veterinary and phytosanitary control and for several rural development programmes.

Besides the transfers to agriculture funded from the government budget, there are also other important sources of support, such as from the Russian-Kyrgyz Development Fund that provides concessional loans, FAO support for the purchase and distribution of mineral fertilizers, and World Bank financial assistance for the purchase and free distribution of winter wheat seeds and fertilizers. It should be noted that funds received from donors are not captured in this study, however these represent an important form of support to agricultural development in Kyrgyzstan.

4.6 Republic of Moldova

The agricultural sector in the Republic of Moldova accounted for 10 percent of GDP and employed 36 percent of the population in 2019 (World Bank, 2020). The Republic of Moldova is a market economy, with more than half of the country's agricultural land cultivated by medium to large commercial farms (farms owning more than 50 hectares) that produce around half of the country's marketable crops. These farms are generally able to exploit economies of scale. The government has emphasized the modernization and development of the Moldovan agriculture sector as important policy goals (Shik *et al.,* 2016).

Real gross agricultural output in the Republic of Moldova[42] grew at a compound annual growth rate of 1.4 percent in the 2005–2018 period. At the same time, real agrifood foreign trade[43] grew at a compound annual growth rate of 4 percent. The Republic of Moldova was a net exporter of agrifood products during the entire analysed period. The value of agrifood exports and imports grew over the period, with exports growing at a more stable pace (FAOSTAT, 2020).

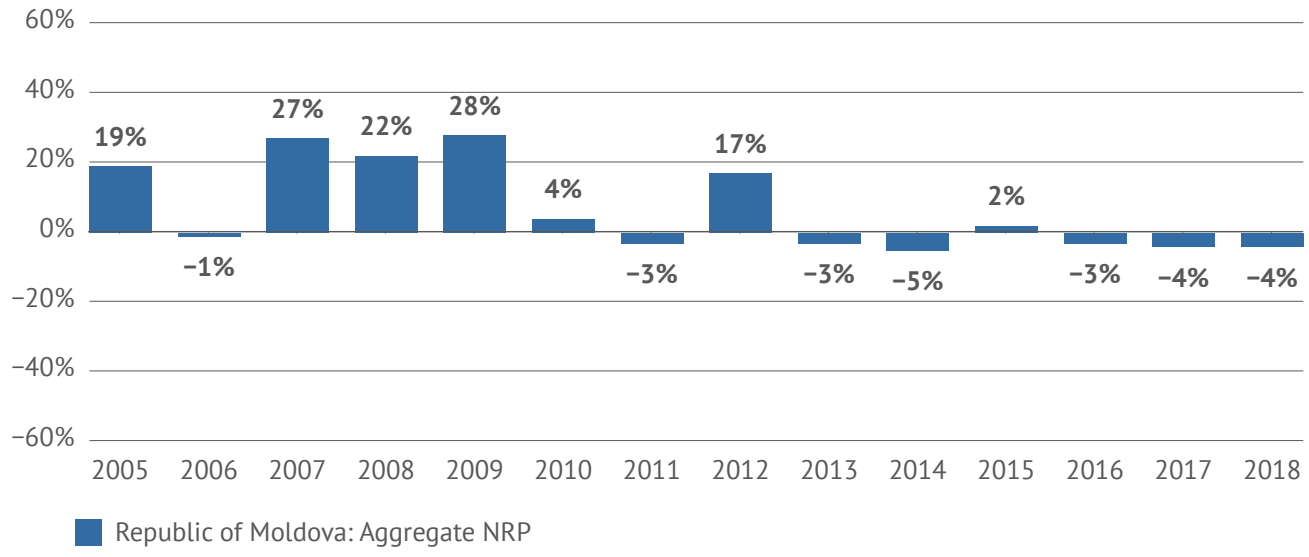
In the 2014–2018 period, the Republic of Moldova was a net exporter of crops and a net importer of livestock commodities. The Republic of Moldova's main trading partner is the European Union, as the Republic of Moldova benefits from a DCFTA with the European Union since September 2014. On average, almost 60 percent of sunflower seeds by value and more than 40 percent of wheat and maize in the analysed years were exported to the European Union. Furthermore, 20 percent of sunflower seeds by value were exported to Türkiye. This commodity is the most important in terms of export value among the analysed exportable commodities. The main export destinations for fruits were the Russian Federation (apples: 78 percent, grapes: 42 percent, plums: 43 percent); the European Union (grapes: 33 percent, plums: 32 percent); and Belarus (apples: 12 percent, grapes: 14 percent, plums: 16 percent). On average, the Republic of Moldova imported livestock products mostly from the neighbouring Ukraine (milk: 37 percent, poultry meat: 66 percent, pig meat: 21 percent), followed by the European Union countries (milk: 26 percent, poultry meat: 16 percent, pig meat: 31 percent) (UN Comtrade, 2020).

4.6.1 Nominal Rates of Protection

The analysis indicates that on aggregate agricultural producers in the Republic of Moldova received prince incentives during most years in the 2005-2012 period and price disincentives from 2013 to 2018 (Figure 25). The aggregate NRPs for the Republic of Moldova fluctuated from -5 percent to 28 percent over the whole period.

An important driver of the alignment of domestic prices with comparable international prices, reflected in the reduction of positive aggregate NRPs could be the growing integration of the Moldovan market with international markets, in particular for the most competitive, export-oriented crops such as maize, sunflower seeds and wheat.

Figure 25. Republic of Moldova: Average aggregate nominal rate of protection at farm gate (percent, weighted average),[a] 2005–2018



[a] *The commodities include maize, milk, pig meat, poultry meat, sunflower seeds and wheat.*

Source: Authors' calculations.

[42] *Measured in constant 2014–2016 prices.*

[43] *Measured in 2015 prices.*

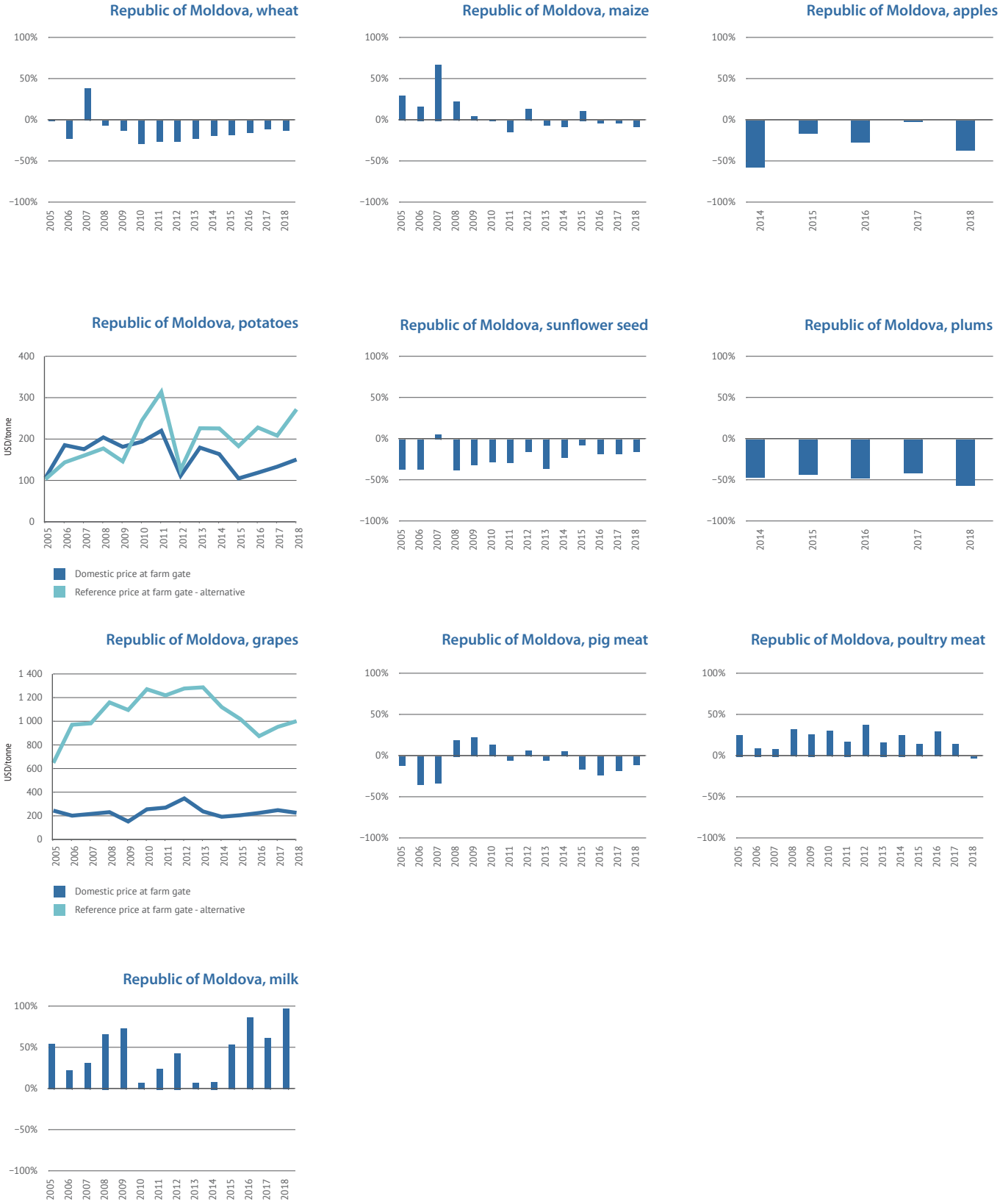
Influencing the calculated price disincentives, the markets for key crops appear to be characterized by inefficiencies, monopolistic/oligopolistic sectoral structures and relatively low productivity (Figure 26). The market power held by intermediaries can lead to a higher share of value added captured by the marketing sector, which suppresses prices to producers. In the Republic of Moldova, monopolies prevail for exportable crops (such as maize, sunflower and wheat) at different segments of the value chain (input markets, export activities etc.). In the case of apples and plums, which are mainly exported to the Russian Federation, the excessive market power held by intermediaries and the low bargaining power of producers are also likely to keep prices to farmers low, creating disincentives.

Other factors affecting farm-level prices are the depreciation of the national currency against the Russian ruble (after 2013) and against the US dollar (after 2016) as well as climatic conditions, such as severe droughts in 2007 and 2012 that resulted in a surge in domestic prices for many crops (see Mogilevsky, 2017).

The analysed livestock commodities tend to be more protected than crops. While import tariffs on crops tend to be very low, they are generally higher for animal products, leading to predominantly positive NRPs for the analysed livestock products as opposed to NRPs for crops.

In addition, milk and meat products are typically produced by smallholder farmers and consumed domestically, with low volumes of trade. Access to foreign markets remains limited due to difficulties associated with obtaining the necessary certification. In addition, weak infrastructure insulates domestic markets from international prices, functioning as an artificial form of protection to domestic producers and possibly leading to an overestimation of price support (Shik *et al.,* 2016).

Figure 26. Republic of Moldova: Nominal Rates of Protection by key commodities (percent), and prices of potatoes and grapes at farm gate (USD/tonne), 2005–2018[a]



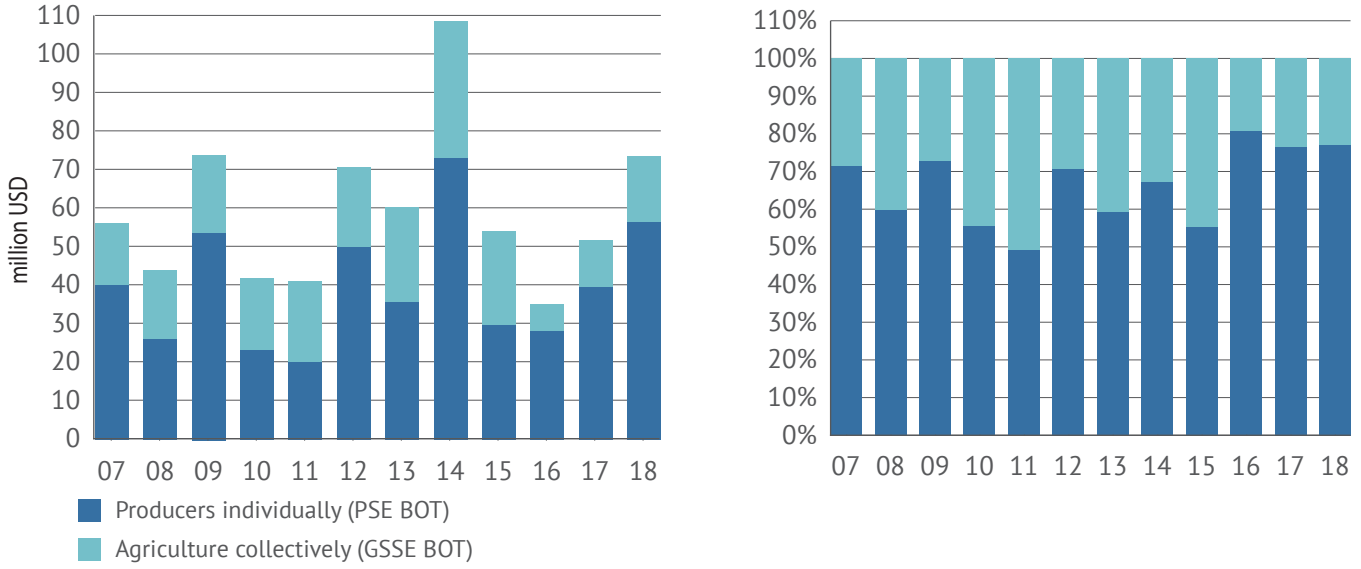
[a] *Due to the low tradability of potatoes, which are typically produced by smaller farms for self-consumption and are not market-oriented, NRPs for this product are not shown in this graph. There have also been issues with comparability between producer and reference prices for grapes, which is also a thinly traded commodity, and NRPs for this product are therefore not shown.*

Source: Authors' calculations.

4.6.2 Budgetary transfers

Budgetary support to Moldovan agriculture varied considerably over the analysed period, reaching its peak in 2014. In 2018, total budgetary expenditures to agriculture amounted to USD 74 million, 77 percent of which were provided in the form of transfers to agricultural producers and the remaining 23 percent as general service support (Figure 27). This composition has been relatively stable over the analysed years, with 70 percent of the total BOT allocated to individual farmers. On average, in the last three years of the analysis (2016–2018), budgetary transfers to individual agricultural producers in the Republic of Moldova amounted to about 2.3 percent of the total value of agricultural production, and total support to agriculture, including GSSE, was equivalent to 3 percent.

Figure 27. Republic of Moldova: Budgetary and other transfers to agriculture by economic group of beneficiaries, 2007–2018



Source: Authors' calculations.

In the last three years of the analysis (from 2016 to 2018), transfers to individual agricultural producers amounted to around USD 42 million annually on average. The vast majority of these funds (around 96 percent) were earmarked for the co-financing of on-farm investments, mostly for the purchase of machinery and equipment, subsidizing the establishment of perennial plantations (orchards and vineyards), and compensation for the costs for irrigation systems, greenhouses and tunnels for vegetable production on protected lands.

Measures for reducing variable input costs on farms were prominent before 2010, whereas in recent years they covered only a small share of the budgetary and other transfers to producers (around 4 percent in the period of the last three years of the analysis, 2016–2018). In recent years, this type of support was mostly limited to reimbursement of the costs of pedigree livestock purchases, subsidizing insurance premiums and subsidizing energy costs of pumping water for agricultural irrigation. In some of the analysed years, farmers also received compensation for losses caused by natural disasters and direct payments for the development of organic agriculture.

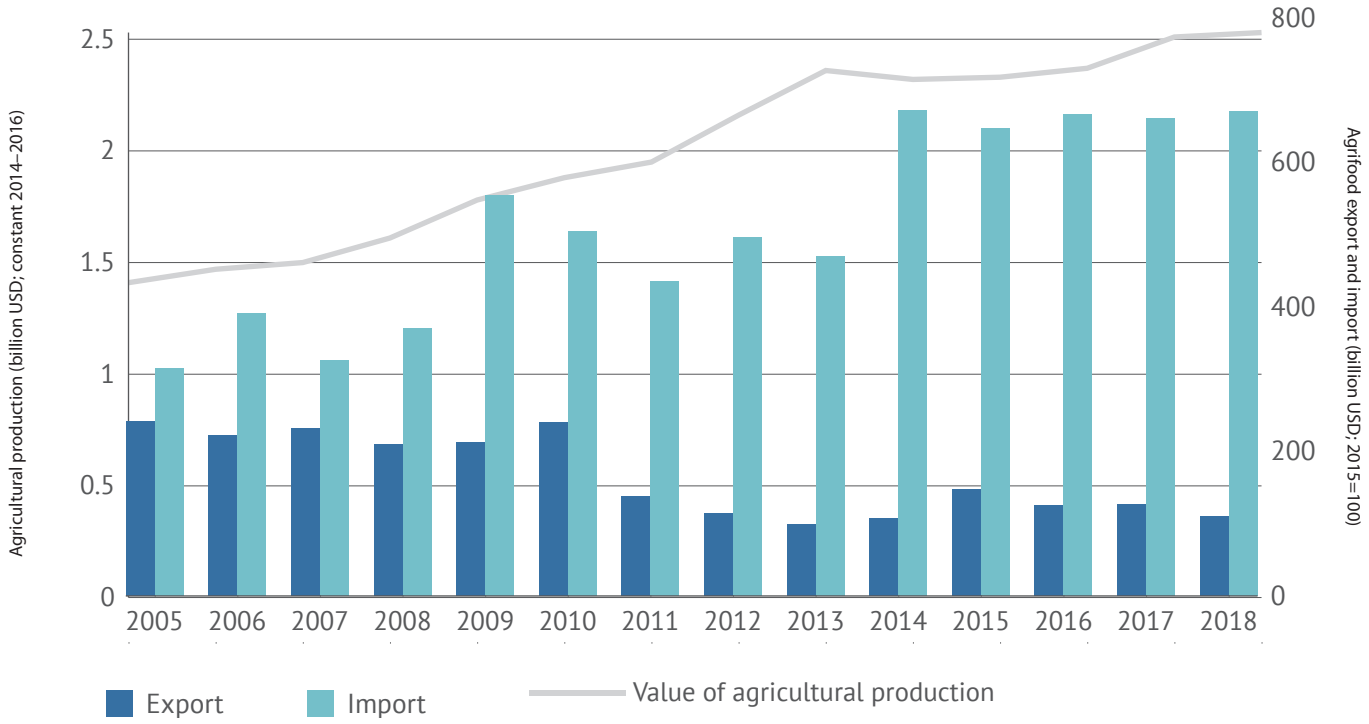
Similar to the volume of funds for agricultural producers, support for general services to agriculture also varied significantly over the analysed period. Budgetary support to general services for agriculture (USD 17 million in 2018) increased over the 2005–2014 period (reaching almost USD 36 million in 2014), mostly due to increased funds for improving food safety and quality, as well as pest and disease control. During 2015–2018, these expenditures decreased significantly, mainly due to a reduction in the allocated state budget for food safety, pest and disease control and reduced budget resources for agricultural research. However, the lion's share of support to general services is still accrues to plant and animal disease management, food safety and quality control, plant testing and genetic improvements and similar functions. This is a strategic priority for the Republic of Moldova as obtaining access to the European Single Market, one of the main export destinations for Moldovan agrifood products, requires efficient control and certification systems to ensure compliance with European food safety and plant protection standards (Shik *et al.,* 2016).

4.7 Tajikistan

Tajikistan's GDP per capita is the lowest among the countries in this study, with agriculture being the main source of livelihoods. In 2019, 45.8 percent of the labour force in Tajikistan was employed in the agricultural sector, which is the highest share among the analysed countries – and the share of agriculture in GDP was 19.8 percent.[44]

Real gross agricultural output in Tajikistan[45] grew at a compound annual growth rate of 4.2 percent in the period from 2005 to 2018. At the same time, real agrifood foreign trade[46] grew at a lower compound annual growth rate of 2 percent. Tajikistan was a net importer of agrifood products throughout the analysed period with net imports increasing over time as the value of agrifood exports decreased from 2005 and the value of imports increased in the 2005–2018 period (Figure 28).

Figure 28. Tajikistan: Value of gross agricultural production and agrifood foreign trade, 2005–2018



*Source: Authors' calculation based on FAOSTAT data (**FAOSTAT.** 2020. Data on agricultural production, value of agricultural production, agricultural trade by selected countries. Rome, FAO. http://www.fao.org/faostat/en/#data).*

Between 2014 and 2018, Tajikistan was (on average) a net importer of the key commodities analysed in this study, with the exception of cotton. Wheat was almost exclusively imported from Kazakhstan, while more than half of the country's egg imports were sourced from the Russian Federation, with an additional 43 percent imported from the Islamic Republic of Iran. Milk was mostly imported from the Russian Federation (62 percent on average) over the observed period. Cotton, which is by far the country's most important export commodity, was mainly exported to Türkiye (34 percent), followed by the Islamic Republic of Iran (24 percent), the Russian Federation (17 percent) and Pakistan (14 percent) (UN Comtrade, 2020).

[44] *Source: Agency on Statistics under the President of the Republic of Tajikistan, Socioeconomic situation in Tajikistan, January–December 2019.*
[45] *Measured in 2014–2016 constant prices.*
[46] *Measured in 2015 prices.*

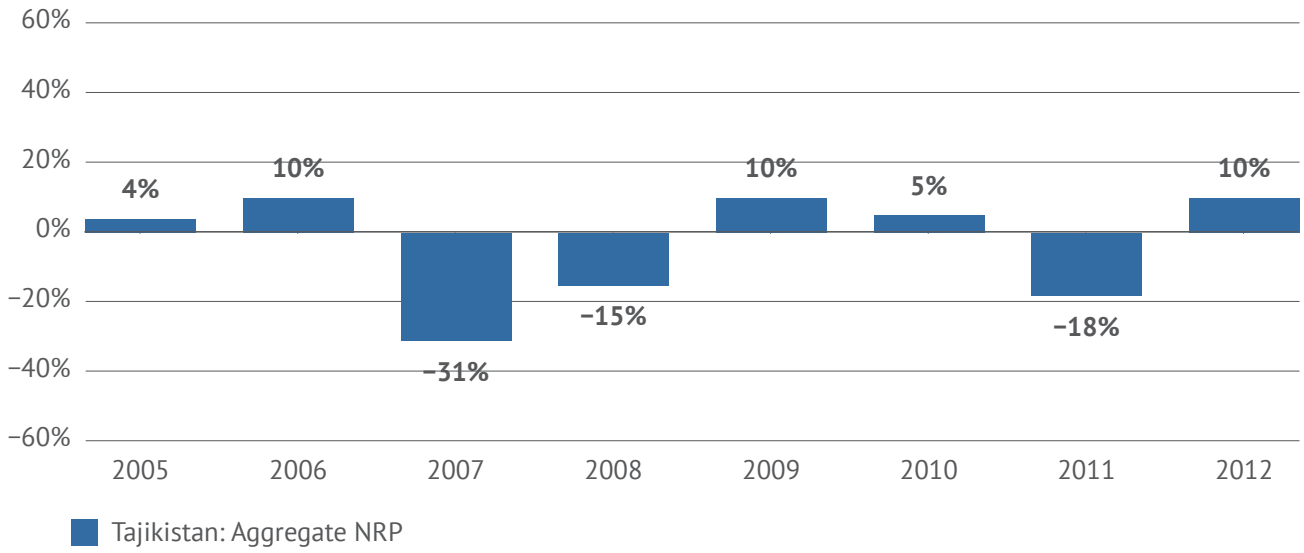
4.7.1 Nominal Rates of Protection

It should be noted that for Tajikistan the data limitations described in section 2.4.1 are considerable and the results should be treated with caution. Nevertheless, this study is a starting point as considerable amount of data was collected, validated and organized in uniform data templates, adding value to policy monitoring and analysis. Future data collection and analysis would enable the results to be improved with more complete commodity-specific data.

The preliminary results for Tajikistan show irregular patterns of price incentives at aggregate levels from 2005 to 2012 – the period for which, due to data limitations, only three products were analysed: cotton, milk and wheat. Aggregate NRPs for these three products ranged from –31 percent to 10 percent (Figure 29) during that period.

Overall, limited market and trade integration (Bobokhonov *et al.,* 2017), with a prevalence of subsistence farming and related market power issues, affected the calculated values of NRPs. In addition, macroeconomic developments in the region, such as exchange rate fluctuations, economic downturns and inflation affect the movements in estimated NRPs (Mogilevsky, 2017).

Figure 29. Tajikistan: Average aggregate nominal rate of protection at farm gate (percent, weighted average),[a] 2005–2012



[a] *The commodities include cotton, milk and wheat.*

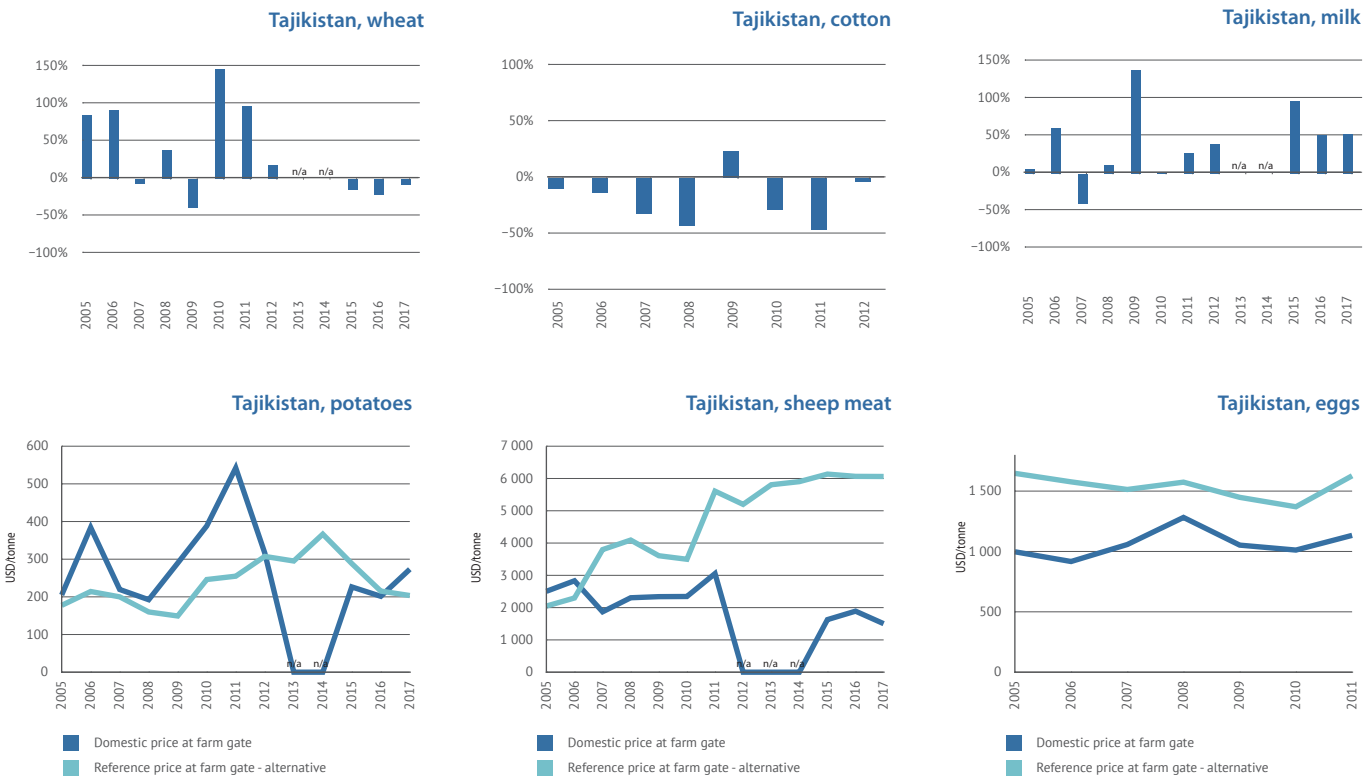
Source: Authors' calculations.

At the commodity level, the erratic patterns of calculated NRPs become even more obvious (Figure 30). In many years, wheat producers in Tajikistan received higher prices than the corresponding reference price. During 2005–2006 and 2010–2011, NRPs reached levels close to 100 percent or even higher. These high estimates could be explained by unaccounted differences in quality between imported (mostly from Kazakhstan) and domestically produced wheat as well as the high production costs of wheat produced Tajikistan, predominately by small-scale producers. After 2012, the NRPs are more stable, with lower price incentives to wheat producers. The devaluation of the national currency against the US dollar may have contributed to this drop.

In terms of the value of agricultural production, cotton represents the most important sector in Tajikistan's economy (Kasimov, 2013). Tajikistan was a net exporter of cotton during the analysed period. The results indicate disincentives to cotton producers during most years until 2012 (which is in line with earlier findings by Christensen and Pomfret (2008), with positive value recorded only in 2009. Output prices for cotton have actually been lower than input costs prior to 2009, which led to debt accumulation by cotton producers as farmers were not able to make profits under the existing conditions (Kasimov, 2013). In 2009, the government issued debt relief to cotton farmers (Bazarov, 2010). According to information provided by the country expert who participated in this study, producers started to earn a profit after this was implemented. However, the NRPs indicate that they still received domestic prices below comparable international prices.

In Tajikistan, milk production is fragmented, farmers use outdated technology, and trade infrastructure is weak. This could be the main driver of high costs that push domestic prices above comparable international prices, affecting the calculations of NRPs. As a result, while not policy induced, NRPs for milk appear to be positive. Tajikistan imported milk at prices below domestic prices during the analysed period, with imports coming mostly from the Russian Federation.

Figure 30. Tajikistan: Nominal Rates of Protection by key commodities (percent), and prices of potatoes; sheep meat and eggs at farm gate (USD/tonne), 2005–2017[a]



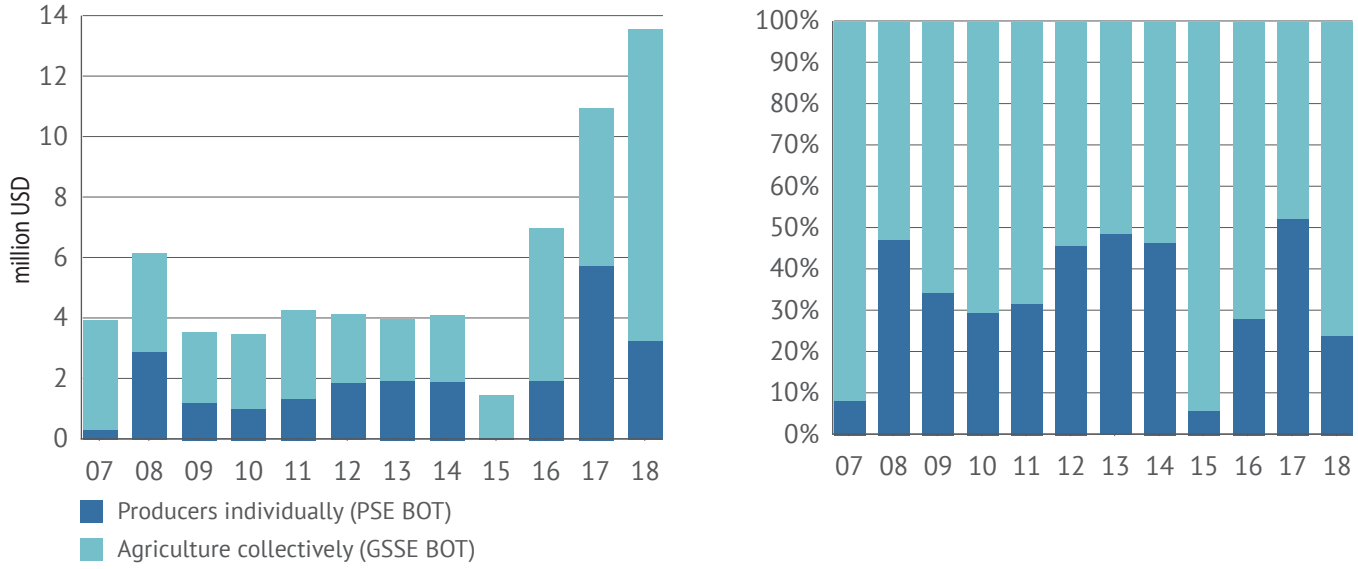
[a] *Due to the low tradability of potatoes, sheep meat and eggs, which are typically produced by smaller farms for self-consumption and are not market-oriented, the NRPs are not shown in this graph.*

Source: Authors' calculations.

4.7.2 Budgetary and other transfers to agriculture

In Tajikistan, unlike in the other countries analysed in this report, support to general services has a larger share in the overall transfers to agriculture, which overall are very low. Between 2016 and 2018, on average around 65 percent of the total support, or USD 7 million per year, was intended for general services. In 2018 the total budget for agriculture, including transfers to agricultural producers, was very modest at USD 13.6 million (Figure 31). In the 2016 to 2018 period, there is a notable increase in the amount of funds dedicated to agriculture. Total budgetary support to agriculture in Tajikistan represented 3.2 percent of the total value of agricultural production in 2016, while it was 1.0 percent on average over the 2007–2016 period (data on the value of production is not available in 2017 and 2018). In 2015, several measures were not implemented, but these were resumed in the following years.

Figure 31. Tajikistan: Budgetary and other transfers to agriculture by economic group of beneficiaries, 2007–2018



Source: Authors' calculations.

Two major projects, namely the Community-Based Agricultural Support Project and the Livestock and Pasture Development Project, co-founded by donors, in particular the International Fund for Agricultural Development, significantly contributed to the rising support for general services in recent years. This underlines the significance of donor funds for agricultural development in Tajikistan. Besides these initiatives, several national programmes for livestock development and pest and disease control have also been put in place.

Agricultural producers individually received on average around 35 percent of total support to agriculture in the 2016 to 2018 period. The most important instrument of producer support is subsidies for leasing of agricultural machinery. To a lesser extent, Tajikistan also implemented measures to reduce variable input costs on farms, in the form of subsidies for seeds – mainly wheat, potato and grass.

It needs to be recognized that the budgetary data collected for Tajikistan during this study is not complete. There are data gaps, for example related to specific projects in support of agriculture. The BOT analysis covers solely programmes under the Ministry of Agriculture, while agricultural programmes under the responsibility of other ministries are not included in the analysis (such as the development of new irrigated lands and the rehabilitation of lands).

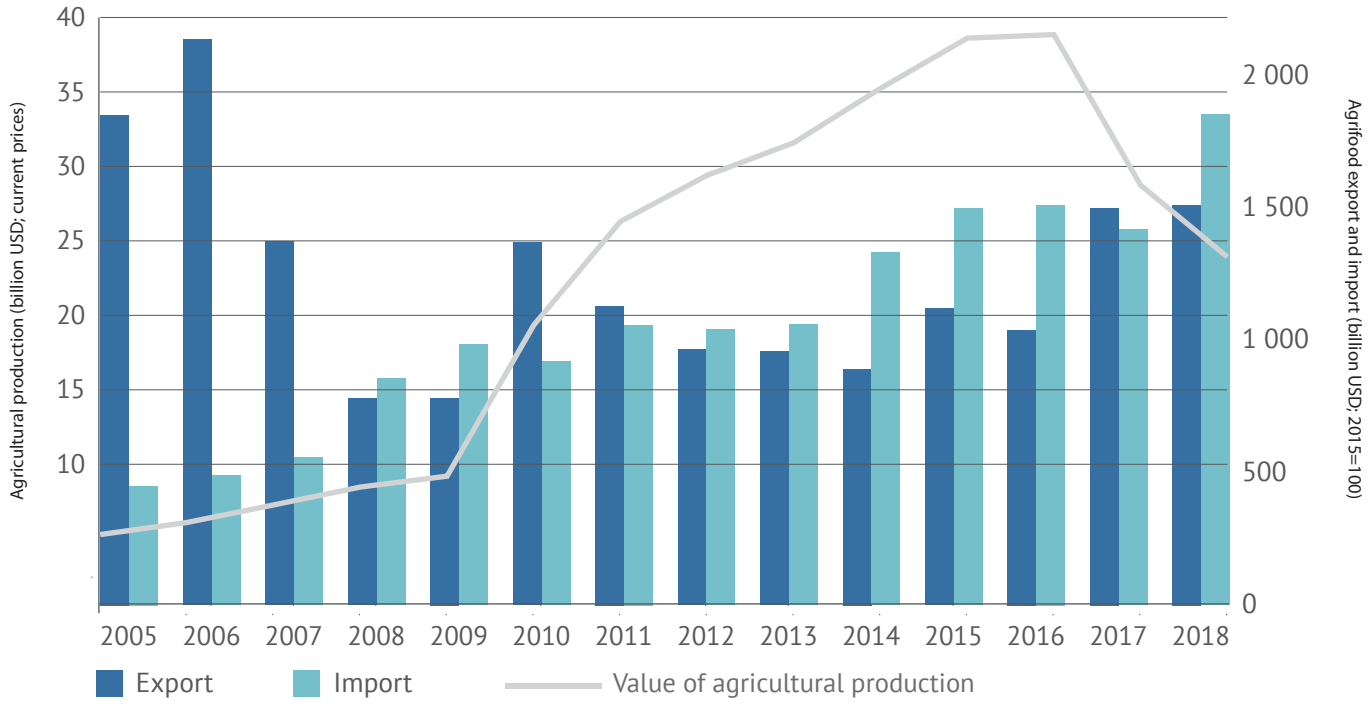
4.8 Uzbekistan

Agriculture is a key sector in Uzbekistan. In 2019 agriculture accounted for 25.5 percent of the GDP in Uzbekistan – the highest share among all the countries in the Europe and Central Asia region – with 24 percent of the workforce being employed in this sector (World Bank, 2020).

Real gross agricultural output in Uzbekistan[47] grew at a high compound annual growth rate of 11.3 percent in the period from 2005 to 2018. At the same time, real agrifood foreign trade[48] grew at a much lower compound annual growth rate of 3 percent. Uzbekistan was a net exporter of agrifood products in the 2005–2007 period, as well as in 2010, 2011 and 2017. The value of agrifood exports decreased significantly from 2005 to 2008 and has been fluctuating since, with an increase registered in 2017 and 2018. However, the value of agrifood exports remains below the level in 2005. Agrifood imports, on the other hand, have been increasing steadily over the analysed period (Figure 32).

[47] *Measured in constant 2014–2016 prices.*
[48] *Measured in 2015 prices.*

Figure 32. Uzbekistan: Value of gross agricultural production and agrifood foreign trade, 2005–2018



Source: ***FAOSTAT.*** *2020. Data on agricultural production, value of agricultural production, agricultural trade by selected countries. Rome, FAO. http://www.fao.org/faostat/en/#data*

In recent years (from 2015 to 2019), Uzbekistan was on average a net importer of eggs and wheat, and a net exporter of apricots, cotton, sweet cherries and tomatoes. For most of the analysed commodities, Kazakhstan was the Uzbekistan's main trading partner. Over the analysed period, almost all imported wheat came from Kazakhstan (97 percent), around 44 percent of the total value of imported eggs originated in Türkiye, with an additional 27 percent sourced from the European Union. Almost 70 percent of exported apricots and approximately 75 percent of both tomatoes and sweet cherries were shipped to Kazakhstan.

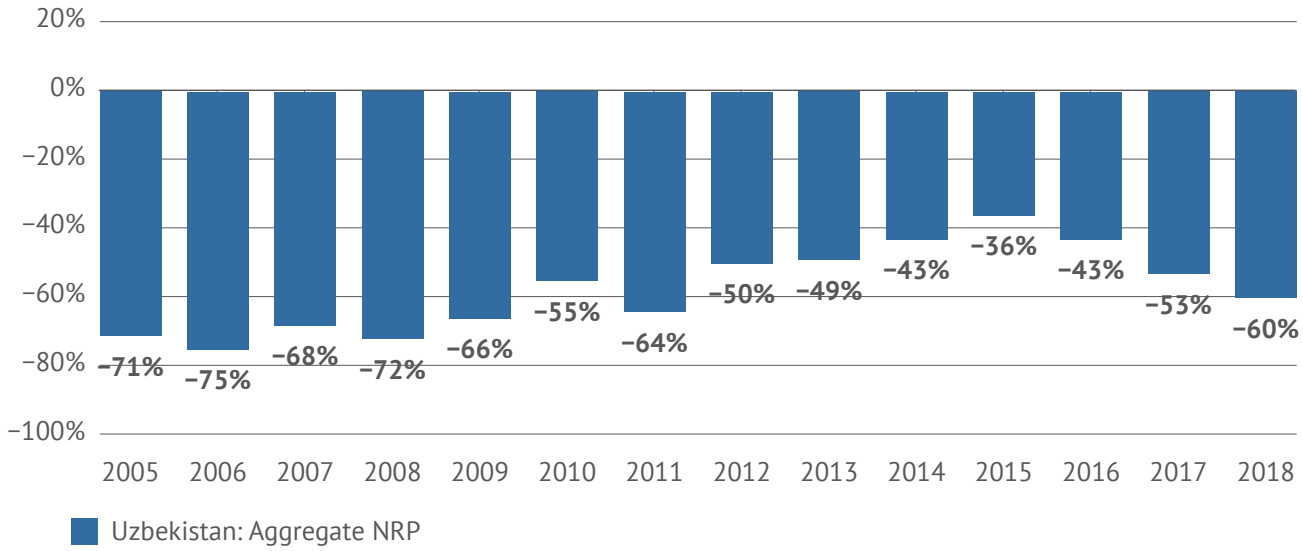
As for Tajikistan, the most important exportable commodity for Uzbekistan in terms of value is cotton, however, its contribution decreased rapidly over the period from 2005 to 2018. This comes as a result of rapidly declining production[49] and fluctuating world prices (for a discussion on this refer to MacDonald, 2012). During 2015–2019, Uzbekistan exported around 40 percent of its cotton to China, around 25 percent to the Islamic Republic of Iran and almost 20 percent to Bangladesh (UN Comtrade, 2020).

4.8.1 Nominal Rates of Protection

The analysis of prices yields negative aggregate NRPs, implying strong price disincentives for Uzbek farmers, over the entire period from 2005 to 2018 (Figure 33). The aggregate NRPs range from -36 percent to -75 percent. It is important to note that the analysed key commodities cover only a small share of the value of agricultural production in Uzbekistan (around one-quarter in the 2014–2016 period), and no information about access costs could be collected as mentioned in section 2.4.1. In addition, for foreign trade data for Uzbekistan reported imports and exports of trading partners were used (mirror data), using the UN Comtrade database. For these reasons, as in the case with Tajikistan, the analysis should be considered as an exploratory effort, and the values of the NRPs for Uzbekistan at both the aggregate and commodity levels should be treated with caution.

[49] *Due to food security concerns combined with the environmental and social problems associated with cotton production, a relative shift in the cropping structure occurred, first to wheat and in recent years to horticulture (Schroeder et al., 2018).*

Figure 33. Uzbekistan: Average aggregate nominal rate of protection at farm gate (percent, weighted average),[a] 2005–2018



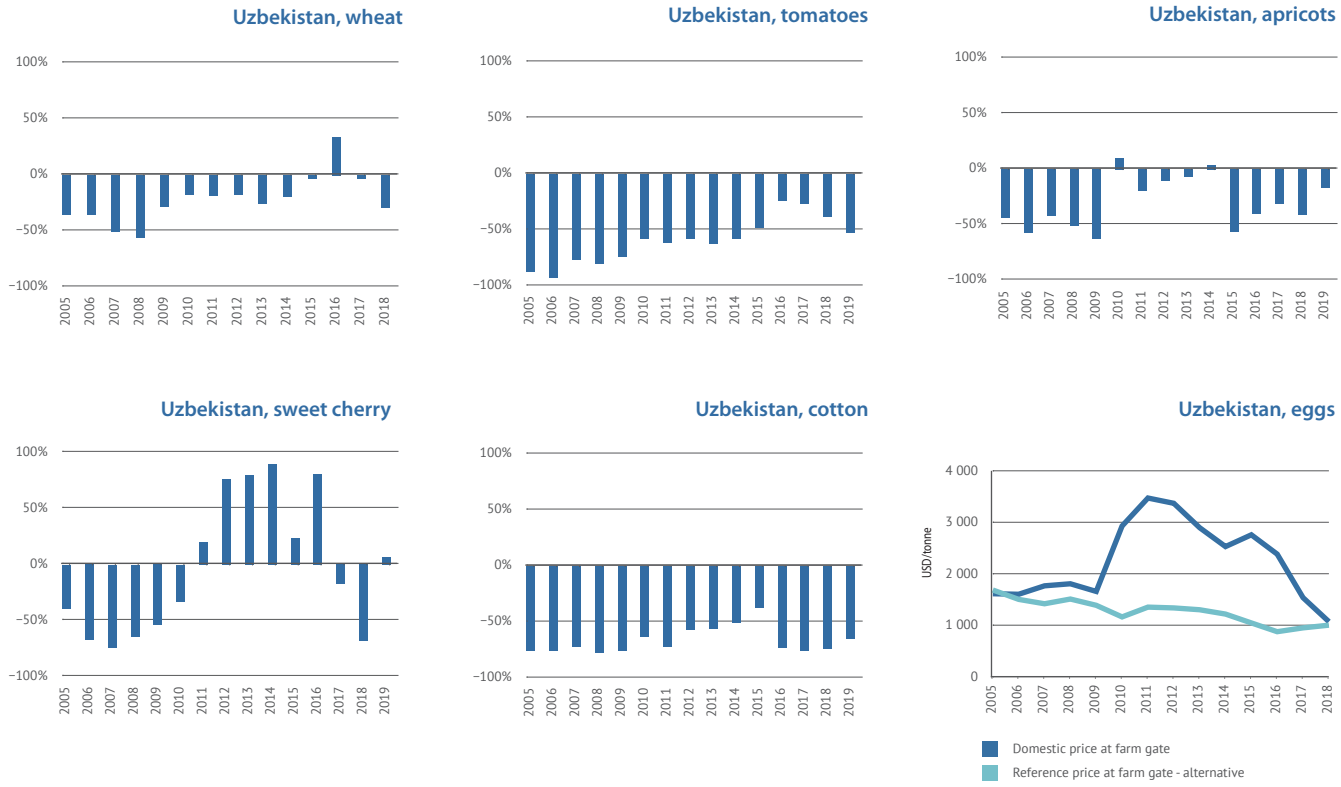
[a] *The commodities include apricots, cotton, sweet cherries, tomatoes and wheat.*

Source: Authors' calculations.

Strong negative price disincentives can be explained by distinctive domestic agricultural and trade policies, such as government procurement of cotton, fruits, vegetables and wheat at administrative prices, which are significantly lower than comparable reference prices. In addition, a restrictive, state-controlled trade regime (which included export bans and export tariffs, repatriation of exports earnings and other trade restrictions) was in place until 2017. Monopolized exports and strong currency devaluations and depreciation throughout the analysed period contributed to price disincentives (Schroeder *et al.,* 2018; MacDonald, 2012).

In 2017, the government adopted a new development strategy for Uzbekistan for the 2017–2021 period. The strategy included broad trade liberalization and facilitation and an aspiration to expand Uzbekistan ′s export potential. At the same time, the government moved to a floating exchange rate regime and lifted restrictions on currency exchange, which led to the Uzbek Som losing half of its value (Schroeder *et al.,* 2018). At the same time, the monopoly of Uzagroexport on fruit exports was lifted (FAO, 2020), allowing private sector actors to conduct export activities. Uzbekistan started to liberalize its economy in 2017, but the effects of the reforms are not yet reflected in the level of the aggregate NRPs, given that the analysis was undertaken only until 2018. These initial trade liberalization policies were likely not sufficient to compensate for the negative effects of strong macroeconomic shocks on agricultural producers, such as currency depreciation (Mogilevsky, 2017).

Figure 34. Uzbekistan: Nominal Rates of Protection by key commodities (percent), and prices of eggs at farm gate (USD/tonne), 2005–2019[a]



[a] *Due to the low tradability of eggs that are typically produced by smaller farms for self-consumption and are not market-oriented, the NRPs are not shown in this graph.*

Source: Authors' calculations.

At the commodity level, NRPs are also mostly negative (Figure 34). These are largely driven by government interventions in agrifood markets through public procurement and the regulation of imports and exports.

For example, the government often purchased all domestic wheat at administrative prices, which were below market prices (Mirkasimov and Parpiev, 2017). This could be the main driver of price disincentives for agricultural producers of wheat.

Fruit and vegetable production is a profitable activity for smallholders and for commercial farms in Uzbekistan (Schroeder *et al.,* 2018). Nevertheless, study results indicate that in the observed period, producers of apricots and tomatoes generally received domestic prices below comparable international prices, thus experiencing price disincentives. The NRPs estimated for sweet cherries fluctuated more than the NRPs of apricots and tomatoes, and the results indicate price disincentives until 2010 and price incentives for the 2011–2016 period. Then, a drop in NRPs was observed in 2017 and 2018 when the exports of sweet cherries were actively developing. The state's monopoly on fruit and vegetable exports in combination with various export restrictions contributed to the negative NRPs for these products.

In the entire analysed period, the NRPs are strongly negative for cotton (in line with earlier findings by Christensen and Pomfret (2008) and MacDonald (2012). Cotton is a strategic crop for Uzbekistan and its major export commodity. Cotton production has been heavily state controlled. Similar to wheat, in the analysed period, the government bought all cotton from domestic producers at fixed procurement prices that were below export parity prices, and producers were obliged to sell their cotton exclusively through official channels. Strictly state controlled and monopolized exports limited price transmission from international to domestic markets (MacDonald, 2012).

4.8.2 Budgetary and other transfers to agriculture

For Uzbekistan, data on budgetary and other transfers to agriculture was not available for this study. However, previous studies report that in 2017 around USD 1 billion was earmarked to the agricultural sector (FAO, 2016; Schroeder *et al.,* 2018), which is higher than in most countries analysed in this study. Almost half of these funds (USD 490.5 million or 48 percent of total support) were allocated to water management. The rest was allocated to the improvement of irrigated lands and soil, mainly for farms that produce cotton and wheat on low-yielding lands and sell their harvest to the state stock or reserves.[50] Support to agricultural producers was provided in the form of subsidies on variable input costs. Commercial banks and the State Fund to Provide Agricultural Equipment to Rural Areas supplied preferential loans for agricultural mechanization, equipment, construction of greenhouses and the installation of drip irrigation systems. Uzbekistan also implements measures to support consumers, for example through food reserves and procurement of fresh fruits and vegetables to stabilize supplies in the domestic market.

[50] *Information provided by the country expert.*

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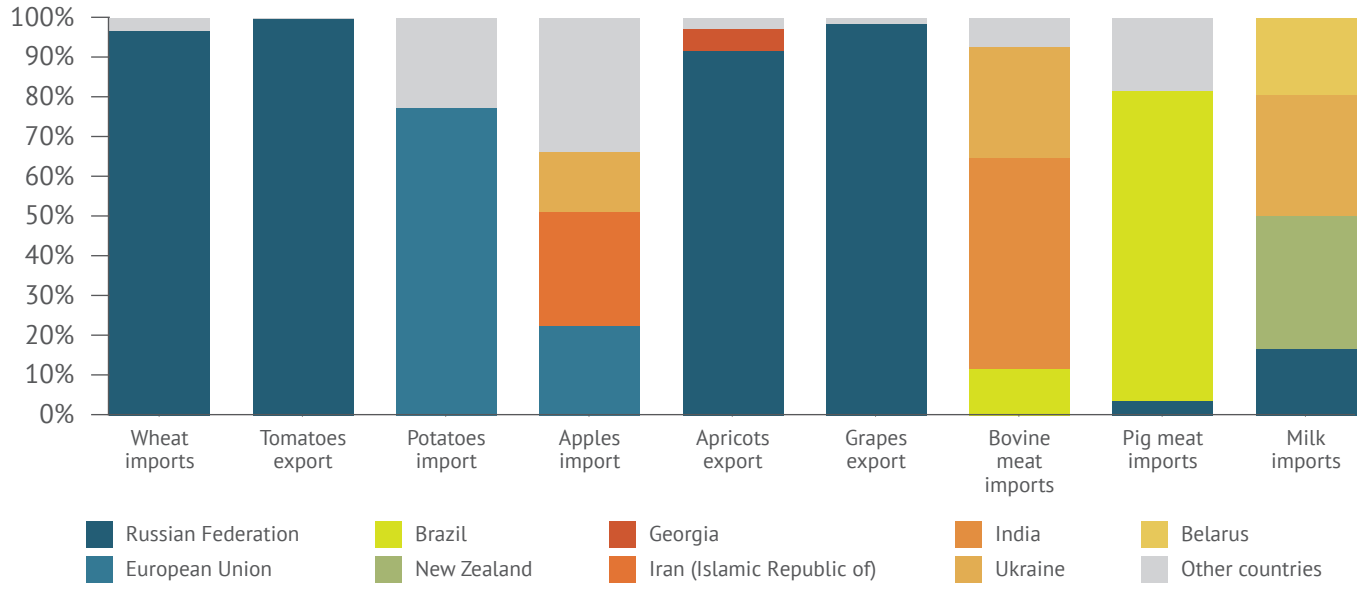
Annexes

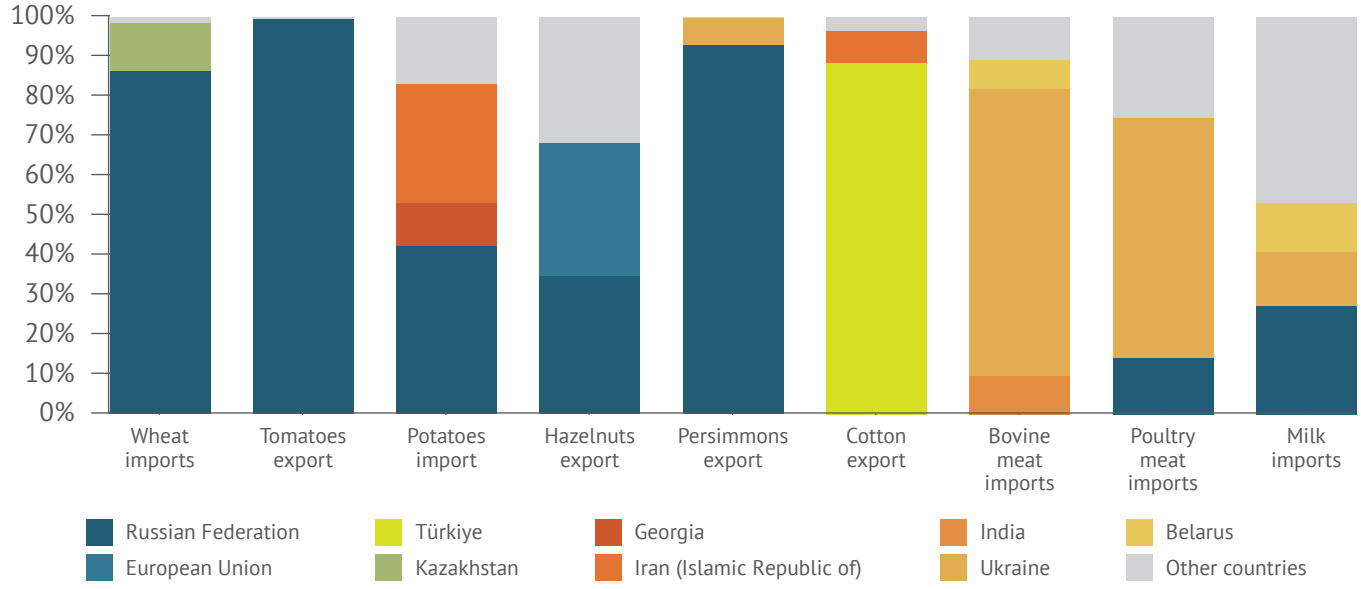
Annex 1: Main trading partners of study countries by analysed commodities

A1 Figure 1. Main trading partners of Armenia by share in total trade value (percent), average 2015–2019



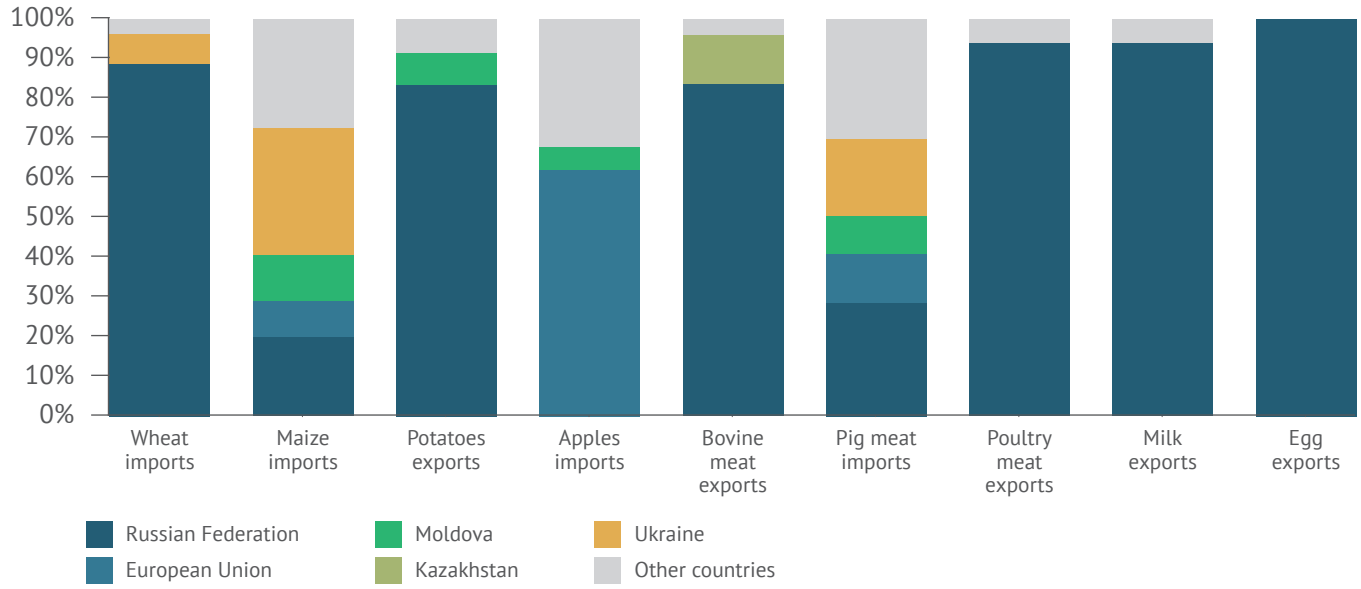
Source: Authors' calculation based on UN Comtrade data (2020).

A1 Figure 2. Main trading partners of Azerbaijan by share in total trade value (percent), average 2015–2019



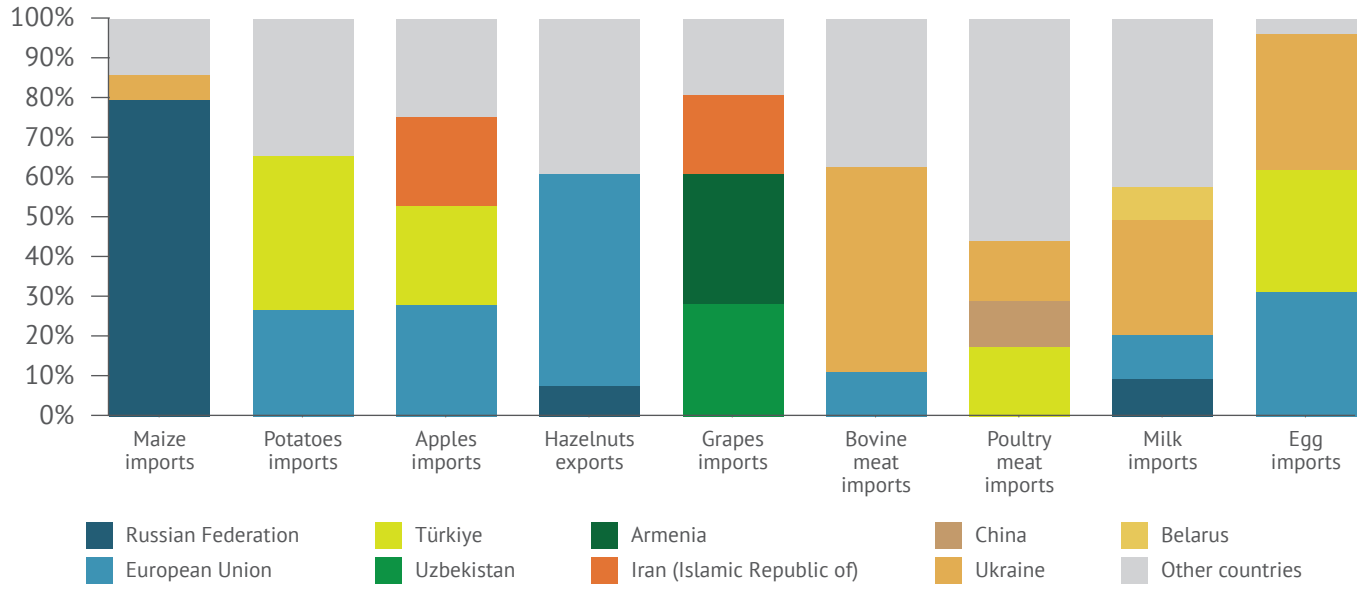
Source: Authors' calculation based on UN Comtrade data (2020).

A1 Figure 3. Main trading partners of Belarus by share in total trade value (percent), average 2014–2018



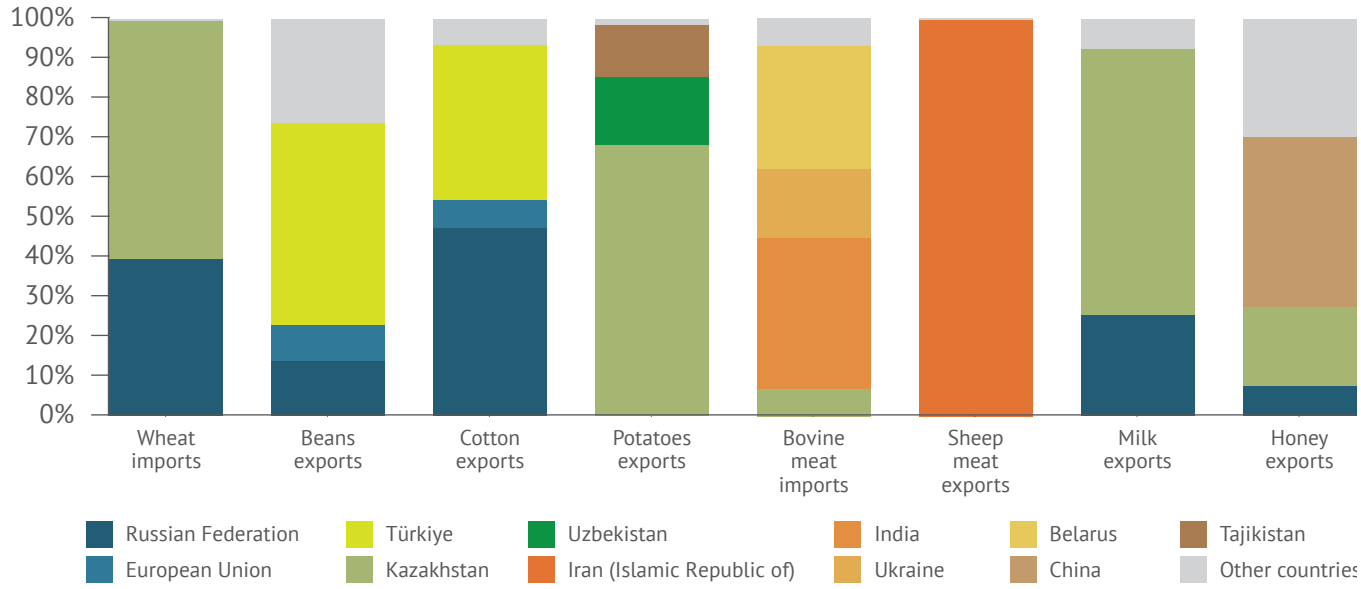
Source: Authors' calculation based on UN Comtrade data (2020).

A1 Figure 4. Main trading partners of Georgia by share in total trade value (percent), average 2015–2019



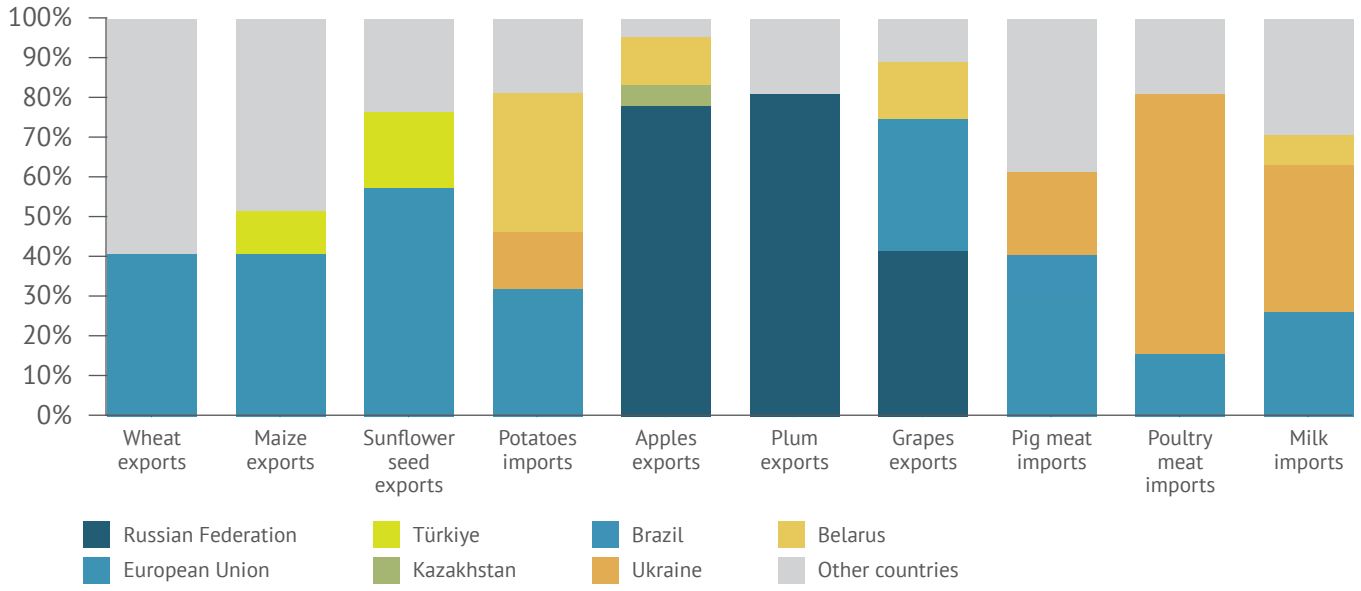
Source: Authors' calculation based on UN Comtrade data (2020).

A1 Figure 5. Main trading partners of Kyrgyzstan by share in total trade value (percent), average 2014–2018



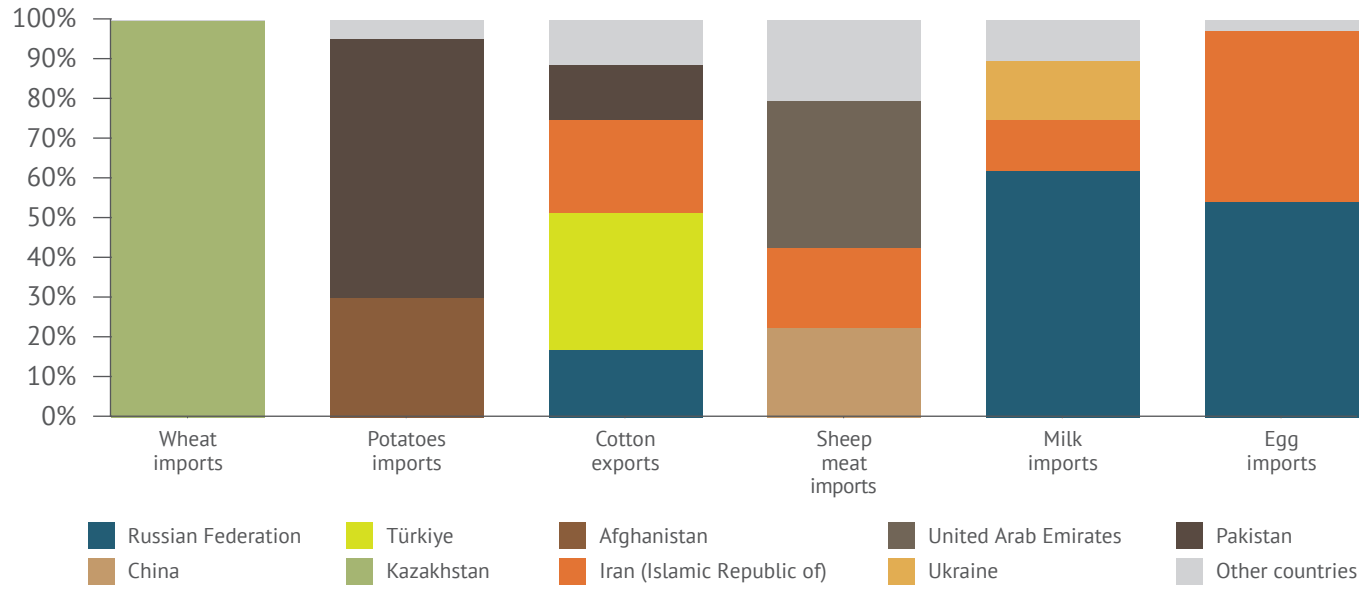
Source: Authors' calculation based on UN Comtrade data (2020).

A1 Figure 6. Main trading partners of the Republic of Moldova by share in total trade value (percent), average 2014–2018



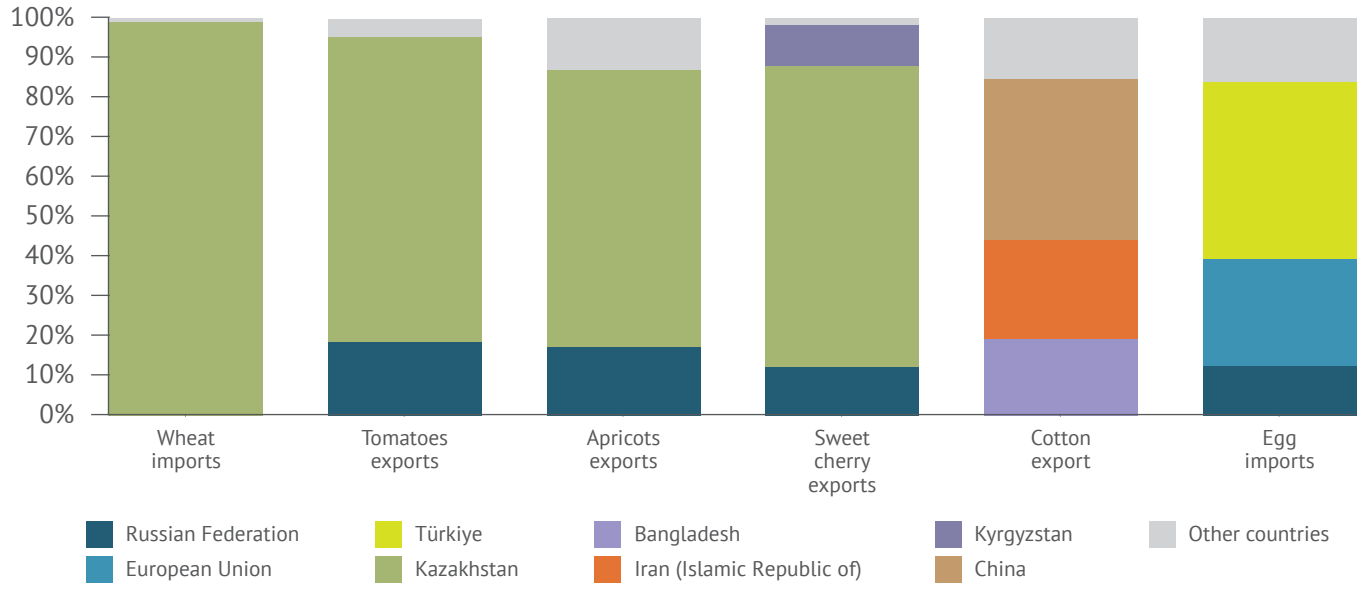
Source: Authors' calculation based on UN Comtrade data (2020).

A1 Figure 7. Main trading partners of Tajikistan by share in total trade value (percent), average 2014–2018 (except milk, sheep meat and eggs: 2010–2014)



Source: Authors' calculation based on Tajikistan foreign trade data (2020).

A1 Figure 8. Main trading partners of Uzbekistan by share in total trade value (percent), average 2015–2019



Source: Authors' calculation based on UN Comtrade data (2020).

Annex 2: Key agricultural commodities analysed for each country

A2 Table 1. Agricultural commodities by country and their combined share in the total value of agricultural production

	Armenia	Azerbaijan	Belarus	Georgia	Kyrgyzstan	Republicof Moldova	Tajikistan	Uzbekistan
Crops:								
	Wheat	Wheat	Wheat		Wheat	Wheat	Wheat	Wheat
			Maize	Maize		Maize		
						Sunflower seed		
					Beans, dry			
	Tomatoes	Tomatoes						Tomatoes
	Potatoes	Potatoes	Potatoes	Potatoes	Potatoes	Potatoes	Potatoes	
	Apples		Apples	Apples		Apples		
	Apricots							Apricots
								Sweet cherry
						Plums		
		Hazelnuts		Hazelnuts				
		Persimmons						
	Grapes			Grapes		Grapes		
		Cotton			Cotton		Cotton	Cotton
Livestock:								
	Bovine meat	Bovine meat	Bovine meat	Bovine meat	Bovine meat			
	Pig meat		Pig meat			Pig meat		
					Sheep meat		Sheep meat	
		Poultry meat	Poultry meat	Poultry meat		Poultry meat		
	Milk	Milk	Milk	Milk	Milk	Milk	Milk	
			Eggs	Eggs			Eggs	Eggs
					Honey			
Total no. of commodities	**9**	**9**	**9**	**9**	**8**	**10**	**6**	**6**
Share in the total value of agricultural production; average 2014–2016 (based on FAOSTAT data for VP in constant prices 2004–2006, USD million)	**45%**	**60%**	**74%**	**71%**	**61%**	**80%**	**44%**	**25%****

** Commodities highlighted in blue were added in the 2020 study, when the commodity list was expanded for countries already analysed in the pilot study.*
*** Uzbekistan: based on the actual 2014–2016 data (actual reported domestic prices and domestic production; in current prices), collected by the country expert.*

Source: Authors' compilation based on study datasets.

A2 Table 2. HS codes/aggregates,[a] used in the calculation of net trade status and trade intensity

Crops:	Armenia	Azerbaijan	Belarus	Georgia	Kyrgyzstan	Republicof Moldova	Tajikistan	Uzbekistan
Wheat	Calculated for HS 1001	Calculated for HS 1001	Calculated for HS 1001		Calculated for HS 1001	Calculated for HS 1001	Calculated for HS 1001	Calculated for HS 1001
Maize			Calculated for HS 1005	Calculated for HS 1005		Calculated for HS 1005		
Sunflower seed						Calculated for HS 120600		
Beans, dry					Calculated for HS 071333			
Tomatoes	Calculated for HS 070200	Calculated for HS 070200						Calculated for HS 070200
Potatoes	Calculated for HS 0701	Calculated for HS 0701	Calculated for HS 0701	Calculated for HS 0701	Calculated for HS 0701	Calculated for HS 0701	Calculated for HS 0701	
Apples	Calculated for HS 080810		Calculated for HS 080810	Calculated for HS 080810		Calculated for HS 080810		
Apricots	Calculated for HS 080910							Calculated for HS080910
Sweet cherry [1]								From 2005–2011 calculated for HS 080920; from 2012–2019 calculated for HS 080929
Plums						Calculated for HS 080940		
Hazelnuts		Calculated for HS 080221 + HS 080222; converted into in shell equivalent		Calculated for HS 080221 + HS 080222; converted into in shell equivalent				
Persimmons [2]		Calculated for HS 081070						
Grapes	Calculated for HS 080610			Calculated for HS 080610		Calculated for HS 080610		
Cotton		Calculated for HS 520100 + HS 120720			Calculated for HS 520100 + HS 120720		Calculated for HS 5201	Calculated for HS 520100 + HS 120720

[1] Until 2012, sweet and sour cherries were aggregated in HS 080920, after 2012 they were separated at a 6-digit level.
[2] HS 081070 appeared for the first time in 2012, until then persimmons were not separated from other fresh fruit.

Crops:	Armenia	Azerbaijan	Belarus	Georgia	Kyrgyzstan	Republicof Moldova	Tajikistan	Uzbekistan
Livestock:	**Armenia**	**Azerbaijan**	**Belarus**	**Georgia**	**Kyrgyzstan**	**Republicof Moldova**	**Tajikistan**	**Uzbekistan**
Bovine meat	Calculated for HS 0201 + HS 0202; converted into carcass weight equivalent	Calculated for HS 0201 + HS 0202; converted into carcass weight equivalent	Calculated for HS 0201 + HS 0202; converted into carcass weight equivalent	Calculated for HS 0201 + HS 0202; converted into carcass weight equivalent	Calculated for HS 0201 + HS 0202; converted into carcass weight equivalent			
Pig meat	Calculated for HS 0203		Calculated for HS 0203			Calculated for HS 0203		
Sheep meat					Calculated for HS 0204; converted into carcass weight equivalent		Calculated for HS 0204	
Poultry meat		Calculated for HS 020711 + HS 020712 + HS 020713 + HS 020714	Calculated for HS 020711 + HS 020712 + HS 020713 + HS 020714	Calculated for HS 020711 + HS 020712 + HS 020713 + HS 020714		Calculated for HS 020711 + HS 020712 + HS 020713 + HS 020714		
Milk	Calculated for HS 0401 -0406; converted into liquid milk equivalent	Calculated for HS 0401 -0406; converted into liquid milk equivalent	Calculated for HS 0401 -0406; converted into liquid milk equivalent	Calculated for HS 0401 -0406; converted into liquid milk equivalent	Calculated for HS 0401 -0406; converted into liquid milk equivalent	Calculated for HS 0401 -0406; converted into liquid milk equivalent	Calculated for HS 0401 -0406; converted into liquid milk equivalent	
Eggs [3]			Calculated for HS 040700 from 2005–2011 and HS 040711 + HS 040721 from 2012–2019	Calculated for HS 040700 from 2005–2011 and HS 040711 + HS 040721 from 2012–2019			Calculated for HS 040700	Calculated for HS 040700 from 2005–2011 and HS 040711 + HS 040721 from 2012–2019
Honey					Calculated for HS 040900			

[3] HS 040711 and HS 040721 were introduced in 2012 for the first time. Until 2012, hen's eggs were included in code 040700 - Birds' eggs in shell, preserved or cooked, which covers all birds' eggs.
Source: Authors' compilation based on study datasets.

[a] Legend (UN Comtrade, 2020):

0201 – Meat of bovine animals; fresh or chilled
0202 – Meat of bovine animals; frozen
0203 – Meat of swine; fresh, chilled or frozen
0204 – Meat of sheep or goats; fresh, chilled or frozen
020711 – Meat and edible offal; of the poultry of heading no. 0105, of fowls of the species Gallus domesticus, not cut in pieces, fresh or chilled
020712 – Meat and edible offal; of the poultry of heading no. 0105, of fowls of the species Gallus domesticus, not cut in pieces, frozen
020713 – Meat and edible offal; of the poultry of heading no. 0105, of fowls of the species Gallus domesticus, cuts and offal, fresh or chilled
020714 – Meat and edible offal; of the poultry of heading no. 0105, of fowls of the species Gallus domesticus, cuts and offal, frozen
0401 – Milk and cream; not concentrated, not containing added sugar or other sweetening matter
0402 – Milk and cream; concentrated or containing added sugar or other sweetening matter
0403 – Buttermilk, curdled milk and cream, yoghurt, kephir, fermented or acidified milk or cream, whether or not concentrated, containing added sugar, sweetening matter, flavoured or added fruit or cocoa
0404 – Whey and products consisting of natural milk constituents; whether or not containing added sugar or other sweetening matter, not elsewhere specified or included
0405 – Butter and other fats and oils derived from milk; dairy spreads
0406 – Cheese and curd
040700 – Eggs; birds' eggs, in shell, fresh, preserved or cooked
040711 – Birds' eggs, in shell; fresh, fertilised eggs for incubation, of fowls of the species Gallus domesticus (domestic hens)
040721 – Birds' eggs, in shell; fresh, not for incubation, of fowls of the species Gallus domesticus (domestic hens)
040900 – Honey; natural
0701 – Potatoes; fresh or chilled
070200 – Vegetables; tomatoes, fresh or chilled
071333 – Vegetables, leguminous; kidney beans, including white pea beans (phaseolus vulgaris), shelled, whether or not skinned or split, dried
080221 – Nuts, edible; hazelnuts or filberts (corylus spp.), fresh or dried, in shell
080222 – Nuts, edible; hazelnuts or filberts (corylus spp.), fresh or dried, in shelled
080610 – Fruit, edible; grapes, fresh
080810 – Fruit, edible; apples, fresh
080910 – Fruit, edible; apricots, fresh
080920 – Fruit, edible; cherries, fresh
080929 – Fruit, edible; cherries, other than sour sherries (Prunus cerasus), fresh
080940 – Fruit, edible; plums and sloes, fresh
081070 – Fruit, edible; persimmons, fresh
1001 – Wheat and meslin
1005 – Maize (corn)
120600 – Oil seeds; sunflower seeds; whether or not broken
120720 – Oil seeds; cotton seeds; whether or not broken
5201 – Cotton; not carded or combed
520100 – Cotton; not carded or combed

A2 Table 3. HS codes/aggregates,[a] used in the calculation of unit export/import values

Crops:	Armenia	Azerbaijan	Belarus	Georgia	Kyrgyzstan	Republicof Moldova	Tajikistan	Uzbekistan
Wheat	Calculated for HS 100190	Calculated for HS 100190	Calculated for HS 100119 in 2015 and 2016; in other years calculated for HS 100190		Calculated for HS 100190	Calculated for HS 100190	Calculated for HS 1001	Calculated for HS 100190 from 2005–2011; from 2012–2019 calculated for HS 1001
Maize			Calculated for HS 100590	Calculated for HS 100590		Calculated for HS 100590		
Sunflower seed						Calculated for HS 120600		
Beans, dry					Calculated for HS 071333			
Tomatoes	Calculated for HS 070200	Calculated for HS 070200						Calculated for HS 070200
Potatoes	Calculated for HS 070190	Calculated for HS 070190	Calculated for HS 070190	Calculated for HS 070190	Calculated for HS 070190	Calculated for HS 070190	Calculated for HS 0701	
Apples	Calculated for HS 080810		Calculated for HS 080810	Calculated for HS 080810		Calculated for HS 080810		
Apricots	Calculated for HS 080910							Calculated for HS 080910
Sweet cherry [1]								From 2005–2011 calculated for HS 080920; from 2012–2019 calculated for HS 080929
Plums						Calculated for HS 080940		
Hazelnuts		Calculated for HS 080222		Calculated for HS 080222				
Persimmons [2]		Calculated for HS 081070						
Grapes	Calculated for HS 080610			Calculated for HS 080610		Calculated for HS 080610		
Cotton		Calculated for HS 520100			Calculated for HS 520100		Calculated for HS 5201	Calculated for HS 520100

[1] Until 2012, sweet and sour cherries were aggregated in HS 080920, after 2012 they were separated at a 6-digit level.
[2] HS code 081070 appeared for the first time in 2012, until then persimmons were not separated from other fresh fruit.

Crops:	Armenia	Azerbaijan	Belarus	Georgia	Kyrgyzstan	Republicof Moldova	Tajikistan	Uzbekistan
Livestock:	**Armenia**	**Azerbaijan**	**Belarus**	**Georgia**	**Kyrgyzstan**	**Republicof Moldova**	**Tajikistan**	**Uzbekistan**
Bovine meat	Calculated for HS 020110	Calculated for HS 020110	Calculated for HS 020110	Calculated for HS 020110	Calculated for HS 020110			
Pig meat	Calculated for HS 020311		Calculated for HS 02031			Calculated for HS 020311		
Sheep meat					Calculated for HS 020421		Calculated for HS 020421	
Poultry meat		Calculated for HS 020711	Calculated for HS 020711	Calculated for HS 020711		Calculated for HS 020711		
Milk	Calculated for HS 040210	Calculated for HS 040210	Calculated for HS 040221	Calculated for HS 040210	Calculated for HS 040120	Calculated for HS 040210	Calculated for HS 040210	
Eggs [3]			Calculated for HS 040700 from 2005–2011 and HS 040721 from 2012–2019	Calculated for HS 040700 from 2005–2011 and HS 040721 from 2012–2019			Calculated for HS 040700	Calculated for HS 040700 from 2005–2011 and HS 040721 from 2012–2019
Honey					Calculated for HS 040900			

[3] *HS 040711 and HS 040721 were introduced in 2012 for the first time. Until 2012, hen's eggs were included in code 040700 - Birds' eggs in shell, preserved or cooked, which covers all birds' eggs.*
Source: Authors' compilation based on study datasets.

Calculated for HS 020711	unit export/import value NOT used as a border price
Calculated for HS 040210	unit export/import value used as a border price

[a] *Legend (UN Comtrade, 2020):*

020110 – Meat of bovine animals, carcasses and half-carcasses; fresh or chilled
020311 – Meat of swine, carcasses and half-carcasses; fresh or chilled
020421 – Meat of sheep, carcasses and half-carcasses (excluding carcasses and half-carcasses of lamb); fresh or chilled
020711 – Meat and edible offal; of the poultry of heading no. 0105, of fowls of the species Gallus domesticus, not cut in pieces, fresh or chilled
040120 – Dairy produce; milk and cream, not concentrated, not containing added sugar or other sweetening matter, of a fat content, by weight, exceeding 1% but not exceeding 6%
040210 – Dairy produce; milk and cream, concentrated or containing added sugar or other sweetening matter, in powder, granules or other solid forms, of a fat content not exceeding 1.5% (by weight)
040221 – Dairy produce; milk and cream, concentrated, not containing added sugar or other sweetening matter, in powder, granules or other solid forms, of a fat content exceeding 1.5% (by weight)
040700 – Eggs; birds' eggs, in shell, fresh, preserved or cooked
040711 – Birds' eggs, in shell; fresh, fertilised eggs for incubation, of fowls of the species Gallus domesticus (domestic hens)
040721 – Birds' eggs, in shell; fresh, not for incubation, of fowls of the species Gallus domesticus (domestic hens)
040900 – Honey; natural
0701 – Potatoes; fresh or chilled
070190 – Vegetables; potatoes (other than seed), fresh or chilled
070200 – Vegetables; tomatoes, fresh or chilled
071333 – Vegetables, leguminous; kidney beans, including white pea beans (phaseolus vulgaris), shelled, whether or not skinned or split, dried
080610 – Fruit, edible; grapes, fresh
080810 – Fruit, edible; apples, fresh
080910 – Fruit, edible; apricots, fresh
080920 – Fruit, edible; cherries, fresh
080929 – Fruit, edible; cherries, other than sour sherries (Prunus cerasus), fresh
080940 – Fruit, edible; plums and sloes, fresh
081070 – Fruit, edible; persimmons, fresh
1001 – Wheat and meslin
100190 – Cereals; meslin and wheat other than durum
100119 – Cereals; wheat and meslin, durum wheat, other than seed
100590 – Cereals; maize (corn), other than seed
120600 – Oil seeds; sunflower seeds; whether or not broken
5201 – Cotton; not carded or combed
520100 – Cotton; not carded or combed

A2 Table 4. Commodities included in aggregate NRP calculations

Country	Products	Years for which product-specific NRPs were calculated
Armenia	Apples, apricots, bovine meat, milk, pig meat, tomatoes and wheat.	2007–2018
Azerbaijan	Bovine meat, cotton, hazelnuts, milk, poultry meat, tomatoes and wheat	2005–2016
Belarus	Apples, bovine meat, pig meat, poultry meat, eggs, maize, milk and wheat	2010–2018
Georgia	Apples, bovine meat, hazelnuts, maize, milk and poultry meat.	2008–2018
Kyrgyzstan	Bovine meat, cotton, dry beans, honey, milk and wheat.	2010–2016
Republic of Moldova	Maize, milk, pig meat, poultry meat, sunflower seed and wheat	2005–2018
Tajikistan	Cotton, milk and wheat.	2005–2012
Uzbekistan	Apricots, cotton, sweet cherry, tomatoes and wheat.	2005–2018

Annex 3: Data sources by country

A3 Table 5. Sources of foreign trade data and HS tariff code level by country

Country:	Source of data:	HS tariff code level:
Armenia	UN Comtrade, Statistical Committee of the Republic of Armenia for bovine meat	6-digit
Azerbaijan	UN Comtrade	6-digit
Belarus	UN Comtrade	6-digit
Georgia	UN Comtrade	6-digit
Kyrgyzstan	UN Comtrade	6-digit
Republic of Moldova	UN Comtrade	6-digit
Tajikistan	Customs Service under the Government of the Republic of Tajikistan	4-digit codes, 6-digit codes for eggs, sheep meat and total trade for milk
Uzbekistan	UN Comtrade (mirrored data)	6-digit codes

Source: Authors' compilation based on study datasets.

A3 Table 6. Sources of data on domestic producer prices of key commodities by country

Country:	Source of data:
Armenia	Statistical Committee of the Republic of Armenia
Azerbaijan	FAOSTAT
Belarus	National Statistical Committee of the Republic of Belarus
Georgia	National Statistics Office of Georgia
Kyrgyzstan	National Statistical Committee of the Kyrgyz Republic, FAOSTAT (honey)
Republic of Moldova	National Bureau of Statistics of the Republic of Moldova
Tajikistan	FAOSTAT
Uzbekistan	State Committee of the Republic of Uzbekistan on Statistics

Source: Authors' compilation based on study datasets.

A3 Table 7. Sources of data on production volumes of key commodities by country

Country:	Source of data:
Armenia	Statistical Committee of the Republic of Armenia
Azerbaijan	FAOSTAT
Belarus	National Statistical Committee of the Republic of Belarus
Georgia	National Statistics Office of Georgia
Kyrgyzstan	National Statistical Committee of the Kyrgyz Republic
Republic of Moldova	National Bureau of Statistics of the Republic of Moldova
Tajikistan	Agency on Statistics Under the President of the Republic of Tajikistan, FAOSTAT
Uzbekistan	State Committee on Statistics of the Republic of Uzbekistan, FAOSTAT

Source: Authors' compilation based on study datasets.

A3 Table 8. Sources of data on exchange rates by country

Country:	Source of data:
Armenia	Central Bank of the Republic of Armenia, World Bank
Azerbaijan	Central Bank of the Republic of Azerbaijan
Belarus	National Bank of the Republic of Belarus
Georgia	National Bank of Georgia
Kyrgyzstan	National Bank of the Kyrgyz Republic
Republic of Moldova	National Bank of the Republic of Moldova
Tajikistan	National Bank of Tajikistan
Uzbekistan	Central Bank of the Republic of Uzbekistan, World Bank

Source: Authors' compilation based on study datasets.

A3 Table 9. Sources of data on inflation rates (consumer price index, annual average, percent change on previous year) by country

Country:	Source of data:
Armenia	Statistical Committee of the Republic of Armenia
Azerbaijan	State Statistical Committee of the Republic of Azerbaijan
Belarus	National Statistical Committee of the Republic of Belarus
Georgia	National Statistics Office of Georgia
Kyrgyzstan	Ministry of Finance of the Kyrgyz Republic
Republic of Moldova	National Bureau of Statistics of the Republic of Moldova
Tajikistan	Agency on Statistics Under the President of the Republic of Tajikistan
Uzbekistan	State Committee on Statistics of the Republic of Uzbekistan

Source: Authors' compilation based on study datasets.

A3 Table 10. Sources of data on the value of agricultural production by country

Country:	Source of data:
Armenia	Statistical Committee of the Republic of Armenia
Azerbaijan	FAOSTAT, expert calculations for 2017–2018
Belarus	National Statistical Committee of the Republic of Belarus
Georgia	National Statistics Office of Georgia
Kyrgyzstan	National Statistical Committee of the Kyrgyz Republic
Republic of Moldova	National Bureau of Statistics of the Republic of Moldova
Tajikistan	FAOSTAT
Uzbekistan	State Committee on Statistics of the Republic of Uzbekistan

Source: Authors' compilation based on study datasets.

A3 Table 11. Sources of data on budgetary and other transfers by country

Country:	Source of data:
Armenia	Ministry of Agriculture of the Republic of Armenia
Azerbaijan	Ministry of Agriculture of the Republic of Azerbaijan
Belarus	Ministry of Agriculture and Food of the Republic of Belarus
Georgia	Ministry of Finance of Georgia, Ministry of Agriculture of Georgia, International Fund for Agricultural Development, World Bank
Kyrgyzstan	Ministry of Agriculture, Food Processing and Melioration of the Kyrgyz Republic, Ministry of Finance of the Kyrgyz Republic
Republic of Moldova	Ministry of Finances of the Republic of Moldova (2005–2016), World Trade Organization (2005–2010), Agency for Interventions and Payments in Agriculture (2011–2016)
Tajikistan	Ministry of Agriculture of the Republic of Tajikistan
Uzbekistan	Schroeder et al. (2018)

Source: Authors' compilation based on study datasets.

Annex 4: Alternative reference prices at farm gate

A4 Table 12. Alternative reference prices at farm gate[a]

Armenia	Azerbaijan	Belarus	Georgia	Kyrgyzstan	Republicof Moldova	Tajikistan	Uzbekistan
Crops:							
Wheat	Wheat	Wheat: Russian Federation, 2015–2016, durum CIF price; common wheat price for other years		Wheat	Wheat	Wheat	Wheat: Kazakhstan, FOB price
		Maize	Maize		Maize		
					Sunflower seed		
				Beans, dry			
Tomatoes: Türkiye, FOB price (2005–2015); country's own export unit value used in 2016–2019	Tomatoes: Russian Federation, CIF-IF price						Tomatoes: Kazakhstan, CIF price
Potatoes: Russian Federation, FOB+IF price	Potatoes: Russian Federation, CIF price 2005,2008–2011; FOB price for other years	Potatoes: Russian Federation, CIF price	Potatoes: Russian Federation, FOB price	Potatoes: Kazakhstan, CIF price	Potatoes: Poland, FOB+IF price	Potatoes: Pakistan, FOB+IF (KY) price	
Apples: Poland, FOB+IF price		Apples: Poland, FOB price	Apples: Russian Federation, CIF price; Türkiye, FOB price in 2009, 2011–2018		Apples		
Apricots: Georgia, CIF price							Apricots: Kazakhstan, CIF price
							Sweet cherry
					Plums		
	Hazelnuts		Hazelnuts				
	Persimmons						
Grapes: Russian Federation, CIF-IF price			Grapes: Türkiye, FOB price		Grapes: Russian Federation, CIF-IF price		
	Cotton: Türkiye, CIF-IF price			Cotton		Cotton	Cotton
Livestock:							
Bovine meat: Belarus, FOB+IF price	Bovine meat: Belarus, FOB+IF price	Bovine meat	Bovine meat: Belarus, FOB price	Bovine meat: Belarus, FOB price			
Pig meat: Germany, FOB+IF price		Pig meat			Pig meat: Germany, FOB+IF price		
				Sheep meat: Iran, CIF price (data available for 2010, 2011, 2013, 2014, 2016, 2017)		Sheep meat: India, FOB price	
	Poultry meat: Türkiye, FOB+IF price	Poultry meat: Poland, FOB price from 2005 to 2008; 2009 to 2018 country's own export unit value used	Poultry meat: Türkiye, FOB price		Poultry meat: Poland, FOB+IF price		
Milk	Milk: Ukraine, FOB+IF price (SMP)	Milk	Milk	Milk: Kazakhstan, CIF price, HS 040120	Milk	Milk: Ukraine, FOB price	
		Eggs	Eggs: Türkiye, FOB price			Eggs: Russian Federation, FOB price	Eggs: Türkiye, CIF price
				Honey			

[a] Where another country's price for a specific commodity is not specified (non-shaded cells), the country's own unit export/import values at the border brought to the farm gate are used as reference prices; e.g. for wheat in Armenia.

Source: UN Comtrade database (https://comtrade.un.org/); IF costs – Insurance and freight (International Transport and Insurance Costs of Merchandise Trade (ITIC, see OECD, 2020b)); https://stats.oecd.org/Index.aspx?DataSetCode=CIF_FOB_ITIC#

Annex 5: Nominal Rates of Protection (percent) by country and product

A5 Table 13. Nominal Rates of Production (percent) by country and product

Country	Product	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Armenia	Apples	2	40	33	4	6	98	26	13	-1	27	10	38	13	-23	7
	Apricots	na	118	137	199	14	99	13	-38	-71	-60	-6	120	29	50	na
	Bovine meat	-2	-6	20	6	2	25	15	7	21	15	29	37	26	56	na
	Milk	25	44	29	23	42	3	40	28	-7	14	40	59	54	90	46
	Pig meat	62	38	69	168	126	139	171	181	128	191	248	130	158	191	108
	Tomatoes	na	-75	-76	-66	-70	-66	-72	-60	-59	-61	-71	-64	-53	-39	-59
	Wheat	5	26	35	66	13	27	49	51	36	20	11	20	27	34	42
Azerbaijan	Bovine meat	-42	-41	-27	-41	-28	-32	-39	-35	-16	-7	-7	-32	-33	-29	na
	Cotton	32	34	33	25	69	28	-16	31	44	45	35	3	na	na	na
	Hazelnuts	-33	13	25	14	-12	-1	15	16	31	-1	-51	-54	-49	-47	na
	Milk	13	34	-16	40	135	86	72	89	40	68	111	59	28	45	na
	Persimmons	na	na	na	na	na	na	na	-28	-3	-8	-31	-59	-63	-64	na
	Poultry meat	20	38	19	20	47	48	47	50	56	67	67	19	29	-14	na
	Tomatoes	-91	-53	-18	-5	14	32	21	29	-1	-6	-24	-59	-46	-44	na
	Wheat	12	17	5	14	51	72	66	53	52	63	48	6	-3	-11	na
Belarus	Apples	na	na	na	na	na	14	17	22	-14	-11	-18	-4	-7	-48	na
	Bovine meat	-34	-39	-27	-28	-28	-34	-43	-14	-2	-17	-28	-31	-38	-37	na
	Eggs	45	49	19	14	37	31	17	45	28	57	32	45	64	38	na
	Maize	52	57	11	7	105	35	-16	26	24	51	-2	85	161	141	na
	Milk	6	29	-35	9	23	-23	-41	-12	-33	-15	7	-24	-8	14	na
	Pig meat	-10	1	-18	-6	-13	-1	-20	9	-4	-39	-9	-28	-22	-24	na
	Poultry meat	9	na	na	-2	-3	-15	-28	-22	-6	-19	-12	-20	-15	-19	na
	Wheat	-3	-20	-42	-15	-19	-27	-47	-43	-8	-16	-33	-8	-16	-17	na
Georgia	Apples	na	na	na	32	-48	27	13	-28	-36	-34	-25	-24	-19	-58	na
	Bovine meat	na	-15	-5	-15	2	-22	-3	15	37	15	29	45	27	37	na
	Hazelnuts	na	-31	-9	-19	18	10	-15	-9	3	-5	-33	-29	-44	-8	na
	Maize	na	108	63	39	162	76	28	27	31	64	48	49	47	24	na
	Milk	na	46	-8	-8	70	-5	24	16	-2	26	42	50	44	55	na
	Poultry meat	na	115	59	53	29	13	38	30	47	14	24	24	23	-26	na
Kyrgyzstan	Beans, dry	na	na	na	na	na	20	23	34	22	42	-15	0	28	0	na
	Bovine meat	-14	-15	na	76	55	83	10	3	27	24	37	138	13	15	na
	Cotton	na	na	na	na	na	-44	-46	-38	-41	-48	-55	-55	-57	na	na
	Honey	101	10	68	87	26	-16	-3	26	43	78	-33	-23	-32	-31	na
	Milk	-48	-40	-38	-45	-51	-55	-54	-43	-50	-50	-45	-43	-43	-26	-41
	Wheat	42	na	na	10	-15	-11	21	39	20	21	31	3	19	36	na
Republic of Moldova	Apples	na	na	na	na	na	na	na	na	na	-57	-16	-26	-1	-36	na
	Maize	30	17	68	23	5	1	-14	14	-6	-8	12	-3	-3	-8	na
	Milk	55	23	32	67	74	8	25	44	8	9	54	87	62	98	na
	Pig meat	-11	-34	-33	20	23	14	-5	7	-5	6	-16	-23	-17	-10	na
	Plums	na	na	na	na	na	na	na	na	na	-46	-42	-47	-41	-56	na
	Poultry meat	26	10	9	33	27	31	18	38	17	26	15	30	15	-2	na
	Sunflower seed	-36	-36	6	-37	-31	-27	-28	-15	-35	-22	-7	-17	-17	-15	na
	Wheat	1	-22	39	-6	-12	-28	-25	-25	-22	-18	-17	-15	-10	-12	na
Tajikistan	Cotton	-9	-13	-32	-42	24	-28	-46	-3	na	na	na	na	na	na	na
	Milk	6	61	-40	12	138	-1	27	40	na	na	97	52	53	na	na
	Wheat	85	91	-6	38	-38	147	97	18	na	na	-14	-21	-8	na	na
Uzbekistan	Apricots	-44	-57	-42	-51	-63	10	-19	-10	-7	4	-56	-40	-31	-41	-17
	Cotton	-75	-75	-72	-77	-75	-63	-72	-57	-56	-50	-37	-73	-75	-74	-65
	Sweet cherry	-39	-67	-74	-64	-54	-33	20	76	80	90	24	81	-17	-68	7
	Tomatoes	-87	-92	-76	-80	-74	-58	-61	-58	-62	-58	-48	-24	-26	-38	-52
	Wheat	-35	-35	-50	-56	-28	-17	-18	-17	-25	-19	-3	34	-3	-29	na

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Food and Agriculture Organization of the United Nations
Rome, Italy

ISBN 978-92-5-137084-1

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CC2637EN/1/11.22