National Statistics Office of Georgia

MIRROR COMPARISON IN INTERNATIONAL MERCHANDISE TRADE STATISTICS (IMTS)

REPORT

STATISTICS DENMARK

NATIONAL STATISTICS OFFICE OF GEORGIA

EU-FUNDED „TWINNING" PROJECT - STRENGTHENING THE CAPACITY OF THE GEORGIAN STATISTICAL SYSTEM

STATISTICS DENMARK

TWINNING

TBILISI
2021

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1. Foreword: Expert statement

In the period from April 2019 to May 2021, Statistics Denmark has carried out a Twinning project in cooperation with Geostat. We, Mr. Søren Rich and Mr. Stefan Anbro, have represented Statistics Denmark within subcomponent 1.1 of the project: "Mirror Comparison in International Merchandise Trade Statistics". Initially, the work was carried out during physical missions in Georgia, later – due to Corona restrictions – a large number of video meetings were held to reach the objectives to the component. All the way through, we have met active and enthusiastic contributions from Geostat as well as from Georgian customs authorities and National Bank of Georgia. Without these contributions, our input would have been of little value. We would like to express our gratitude towards all partners.

Work within the subcomponent has focused on identifying potential reasons behind the relatively large asymmetries in the datasets for international trade in goods between Georgia and the European Union. These asymmetries appear when a certain trade flow in Georgian data does not equal the corresponding trade in the EU data, i.e. Georgian import from the EU does not equal EU export to Georgia or Georgian export to the EU does not equal EU import from Georgia.

Potentially, asymmetries can appear because of methodological differences in the way data are compiled. Therefore, the project has carried out a thorough review of the compilation of international trade in goods in Geostat. In general, good methodology is applied in Georgian IMTS compilation and there is a good awareness of the international IMTS standards (UN, etc.) among Geostat staff. We have identified only one major deviation from the official IMTS guidelines, namely the application of country of consignment instead of country of origin in Georgian import statistics. However, as EU export is compiled by the country of consignment, not the country of origin, this deviation will actually reduce asymmetries rather than create them. Therefore, we don't see any methodological reason, which might explain the asymmetries.

In order to learn more about the asymmetries, the project has carried out both an overall analysis of asymmetries at total import and export level and an in-depth analysis of a number of major asymmetries at HS6 commodity level. This work has revealed that the by far most significant systematic contribution to asymmetries in the dataset most likely stems from goods in transit through Georgia. These asymmetries appear when goods which are exported to the EU from countries like Azerbaijan and Armenia are shipped from Georgian ports. While these goods are only in transit through Georgia, it can happen that Georgia is recorded as country of origin in the EU customs declaration. This will lead the EU to record import from Georgia, while Georgia records no export. The result is asymmetries in the data between the EU and Georgia as well as in the data between the EU and the actual country of export. Similar cases can appear for import. This analysis also implies that when asymmetries appear due to goods in transit through Georgia, Georgian data are more likely to be correct in these cases than the EU data as the asymmetry appears due to wrongful declaration of country of origin/country of final destination in the EU .[1]

In some cases, it has been possible through contact to traders to establish the correct country of origin/country of destination which should be allocated to traded goods. In such cases, traders can be instructed to report correctly and specific asymmetries can be eliminated from the dataset. However, due to the complexity of trade, only a limited number of cases could be solved within the project. Therefore it is our recommendation that resources should be allocated to further work, both

[1] It should be noted that transit through Georgia might also result in errors in Georgian data if goods in transit are declared to customs as import and subsequent export. This project has not discovered such cases.

in Geostat and in Eurostat and national statistical authorities in the EU Member States, with a view to solving asymmetries by contact to local traders on a case-by-case basis.

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2. Introduction

To enhance trade capacity and economic growth of developing countries and countries with economies in transition, their participation in global trade is becoming increasingly important.

However, while international trade in goods and services, especially manufacturing goods, is increasing between countries as the process of globalization deepens, asymmetry in international trade statistics is becoming more and more evident, thus causing great concern among trade statisticians and policy makers.

Mirror analysis of foreign trade data is one of the most commonly used instruments for comparison data quality of external trade statistics between partner countries in trade. Mirror statistics are bilateral comparisons of two basic measures of a trade flow, which is a traditional tool used for detecting the causes of asymmetry in statistics. Accordingly, mirror statistics are used to compare importer's imports with its partner's exports, and vice versa.

In theory, exports from one country should be the mirror image of imports to its partner countries. In practice, there are discrepancies between the two. The various causes of asymmetries can be classified into three categories:

- ✓ Asymmetries created even with application of a harmonized methodology due to:
  - Different price systems between exports and imports (FOB/CIF[2] valuation);
  - Triangular trade;
  - Time gaps;
  - Exchange rate differences;
  - The use of country of origin in import statistics vs. country of consignment in export;
  - Statistical confidentiality.
- ✓ Asymmetries explained by differences in the methodology:
  - Different trade systems ("general" and "special" trade);
  - Different treatment of specific transactions.
  - Exclusion of some goods from trade statistics;
- ✓ Asymmetries created by dysfunctions in the collection systems:
  - Not proper treatment of some specific goods by the customs administration;
  - Fraudulent reports;
  - Errors into the collection system of the customs authorities;
  - Differences in the classification of goods.
  - Wrong indication of partner country (e.g. in transit goods).

Thus, identification of partner countries and commodities with largest asymmetries and identifying the main reasons causing them is essential for production of coherent and comparable statistical data.

Mirror Comparison in International Merchandise Trade Statistics (IMTS) is one of the activities of the National Strategy for the Development of Official Statistics of Georgia for 2020-2023 in the direction of Development of External Sector Statistics. According to the activity №1.1.9 of the Strategy Action Plan for 2020-2021, Report on Mirror Comparison in International Merchandise Trade Statistics (IMTS) with relevant trade partner/partners is planned to be published in 2021.

[2]Statistical concepts mentioned in this paragraph and their relevance for asymmetry studies are explained further in Annex 1.

Identification of largest asymmetries in bilateral trade statistics between Georgia and EU countries through mirror comparisons and identifying the main reasons for the difference in data is set out in the 2021-2023 Action Plan for the Implementation of the Deep and Comprehensive Free Trade Agreement (DCFTA) with the European Union.

From April 2019 Statistics Denmark is implementing an EU-financed Twinning project in Georgia - Strengthening the capacity of the Georgian Statistical System, in a partnership with the National Statistics Office of Georgia, Geostat. The implementation is done in cooperation with the national statistical institutes of the Czech Republic, Hungary, Finland and Lithuania. The aim of the project is to assist Geostat in further improving statistical capacity and contributing to timely, internationally comparable and reliable statistical data.

Mirror Comparison in International Merchandise Trade Statistics (IMTS) is one of the sub-components of the project under External Trade Statistics component. This report is the result of the work done within this sub-component.

3. Asymmetry Method

3.1. Action plan for the mirror analysis

Mirror Comparison in International Merchandise Trade Statistics (IMTS) started in Geostat within the framework of EU-funded „Twinning“ project - Strengthening the capacity of the Georgian Statistical System with cooperation of experts from Statistics Denmark. Identification of partner countries and commodities with largest asymmetries and identifying the main reasons causing them was the core of the action plan which was as follows:

- ✓ Review of the methodology applied in the international trade statistics
- ✓ Identification of partner countries and commodities with the biggest asymmetry;
- ✓ Selection of major asymmetries at the level of products and partner country for further investigation;
- ✓ Preliminary discussions on possible reasons for the chosen asymmetries;
- ✓ Communication with the national counterparts (Revenue Service under Ministry of Finance of Georgia and National Bank of Georgia) and major users on topical statistical issues;
- ✓ Identification of relevant partner countries for bilateral cooperation on asymmetry studies;
- ✓ Preparation of letters for selected partner countries with description of relevant asymmetries and possible findings;
- ✓ Communication with relevant partner countries and further discussion on possible reasons for the chosen asymmetries;
- ✓ Analyses of specific examinations and data correction (if applicable);
- ✓ Preparation of report with summary of work done and overview of reasons for asymmetries.

It was agreed at the early steps of expert missions to have focus on import from and export to EU-countries. Focus is on the major asymmetries or consistent asymmetries with EU countries or asymmetries which can be improved by methodological changes or better practice in data validation or data compilation in Geostat.

3.2. Data used and data sources

For the purpose of this analysis, mirror statistics were compared, using the statistical value in US Dollars. Comparisons between Georgian and the EU total as well as each of the EU countries were undertaken. Harmonized Commodity Coding and Description System HS2012-2017, combined version was used as commodity classification. Aggregate-level comparisons (totals by partner, 2- and 4-digit level of Combined Nomenclature) were based on the latest available annual data for 2014-2018. Trends in data discrepancies were analyzed. The comparisons of more detailed data (6-digit Combined Nomenclature) were based on the latest 2018 data. For some cases data of 2019 were also analyzed.

Three data sources were used in order to extract data and create tables for analyzing asymmetries: **Geostat data, Comext (Eurostat) and Comtrade (UN) databases.**

As for Eurostat's Comext database the IMTS of the EU Member States are available as special trade. Some of the tables in Comext can show both the country of consignment and country of origin which is a helpful tool in the analysis of asymmetries in exports to EU Member States. UN Comtrade database was decided to use as secondary source in relevant cases e.i. for analysis of totals for EU-Georgia bilateral trade as data compiled according to general trade system available on Comtrade is more comparable with Geostat, besides it is rather useful tool when analysis of data for non-EU countries is needed.

3.3. Choice of asymmetries for examination

The commodities and partner countries with highest discrepancies were indicated in the process of analyzing asymmetries. The 'partner' is the country or group of countries to/from which goods are exported/imported by the reporter. The partner country is usually the country of last known destination for exports, and either the country of origin or the country of consignment for imports. The current mirror analysis was based Georgian data showing the country of consignment in imports and country of last known destination in exports. Unlike Georgia, the country of origin is used by EU-countries when recording the partner country in imports.

3.4. Ways of measuring asymmetry

Asymmetries can be measured in different ways (relative, absolute, weighted, etc.), using different indicators (statistical value, net mass, supplementary quantity) and at different levels (country, chapter, product code, etc.).

Measurement of absolute and relative asymmetries was used in the process of data analysis. Asymmetries were measured by applying the following formulae to the data:

$$\boldsymbol{Asymmetry = Value\ (R) - Mirror\ Value\ (P)}$$

Where:

- R is the Reporter
- P is the Partner
- Value is the statistical value as recorded by the Reporter
- Mirror Value is the mirrored statistical value as recorded by the Partner.

$$\boldsymbol{Absolute\ Asymmetry = ABS\ (Value\ (R) - Mirror\ Value\ (P))}$$

Asymmetry measures the difference between the two recorded (mirrored) values.

Absolute Asymmetry is the absolute value of the Asymmetry.

When asymmetries are calculated on several components (by commodity, by country, etc.) Relative Asymmetry is also used to better reflect the real asymmetry at global level.

$$Relative\ Asymmetry = \frac{Absolute\ Asymmetry}{Value\ (R) + Mirror\ Value\ (P)}$$

Relative Asymmetry is share of Absolute Asymmetry in the sum of two recorded (mirrored) values of Reporter and Partner countries.

3.5. Absolute asymmetry as a tool for identifying the major asymmetries

During the selection of major asymmetries to be examined further, absolute asymmetry was applied. This is due to the fact that asymmetries may have different signs and therefore may cancel out each other when data are aggregated. Therefore, asymmetries on aggregated level should not be taken as a valid indication of where the major problems in the dataset hide.

For instance, one may imagine the following situation:

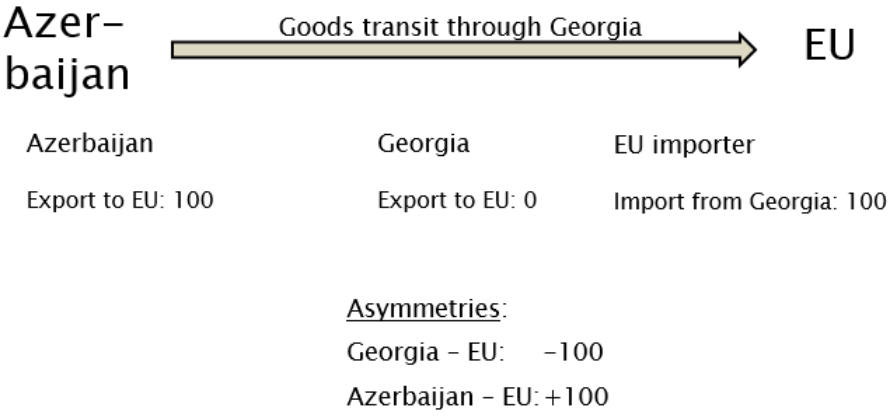
Code	Georgian export	Austrian import	Asymmetry	Absolute asymmetry
1	100	1000	-900	900
2	1000	100	900	900
3	50	0	50	50
Total			50	1850

In this case, there are two large asymmetries between Georgia and Austria, each with a value of 900. However, the asymmetries have opposite signs and cancel out each other when data are aggregated. Therefore, an analysis on aggregate level of asymmetries between Georgia and EU countries will conclude that there is only a fairly limited asymmetry of 50 between Georgia and Austria. The conclusion may be that the data for Austria look good and do not warrant further examination, while in reality there are two large asymmetries which should be investigated. Alternatively, an analysis based on absolute asymmetry may be applied. Such an analysis will reveal that the true amount of asymmetry between Georgia and Austria is 1850.

As mentioned above, in this project an analysis based on absolute asymmetry was applied when the major asymmetries to be examined further were identified. This is described further in section 5.

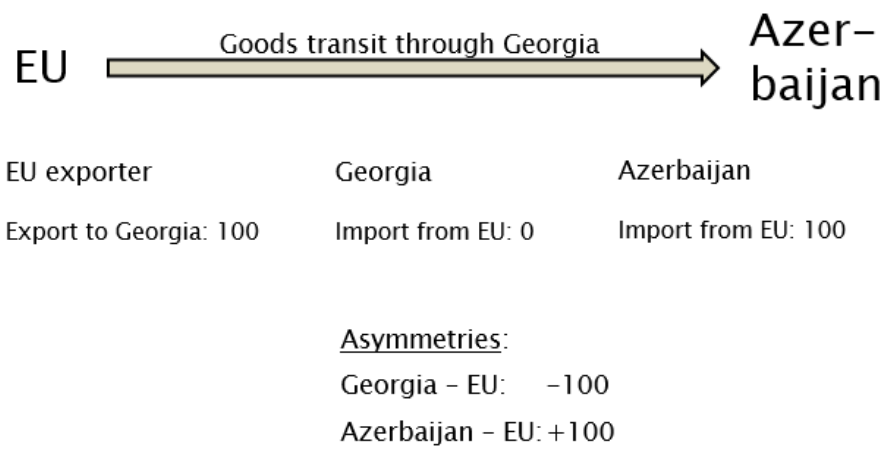
3.6. Mirror asymmetry

During the analysis, the concept of 'mirror asymmetry' was developed to describe certain patterns in the data. Mirror asymmetry refers to the numerous cases where an asymmetry between Georgia and the EU is mirrored by an asymmetry on the same commodity but with a different sign between the EU and another non-EU country than Georgia. These data patterns appear when goods transit through Georgia on their way between the EU and another non-EU country than Georgia. For instance:



In this scenario, a non-EU country, for instance Azerbaijan, exports a good with a value of 100 to the EU. The good travels from Azerbaijan to Georgia and is shipped to the EU from a Georgian port. The exporter in Azerbaijan declares export of 100 to the EU. However, the declarant in the EU is not aware that the good which is shipped from a Georgian port, does not originate from Georgia and therefore import of 100 is declared with Georgia as country of origin on the EU data. The result is an asymmetry -100 between Georgia and the EU and a corresponding mirror asymmetry between the real exporter and the EU of +100.

In case of import from the EU to another non-EU country than Georgia, where the goods transit through Georgia, similar cases can appear, when the declarant in the EU is not aware of the final destination of the goods and falsely declares Georgia as country of destination.



Whenever these mirror asymmetries have been detected in the dataset, they have been taken as a strong indication that transit through Georgia is the most likely explanation for the asymmetry

between Georgia and the EU. In these cases, the analysis also implies that the Georgian data are more likely to be correct than the EU data, as the asymmetry appears due to wrongful declarations in the EU.

4. Methodological review

4.1. Brief overview of External Merchandise Trade Statistics in Georgia

Compilation practice of External Merchandise Trade Statistics in Georgia was reviewed in order to check for any methodological flaws which might explain asymmetries.

External Merchandise Trade Statistics in Georgia are compiled according to the international methodology of the United Nations Statistics Department "International Merchandise Trade Statistics, Concepts and Definitions, 2010" (United Nations, New York, 2011) and "International Merchandise Trade Statistics: Compilers Manual, Revision 1" (IMTS 2010-CM)), (United Nations, New York, USA 2013).

For compilation of External Merchandise Trade statistics Georgia uses the "General trade Concept", which means that crossing a border of the statistical territory of the country is the main criterion for determining exports and imports. Moreover, in the general trade concept the statistical territory includes customs warehouses, all types of free zones, free circulation area and premises for inward processing.

Export implies both domestic exports and re-exports of imported goods. Domestic exports include export of goods produced in the country, as well as imported from abroad, the value of which has significantly changed as a result of domestic processing. Import implies importing of the production and re-import of exported goods.

Export is valued at FOB prices (freight on board), which means the transaction value of the goods and the value of transport and other services performed to deliver the goods at the border of the exporting country. In case of goods transported by ship, this would be the cost of delivering the goods on board the ship at the port of shipment. Import is valued at CIF prices (Cost, insurance and freight), which include the transaction value of the goods, the value of services performed to deliver goods to the border of the exporting country and the value of the services performed to deliver the goods from the border of the exporting country to the border of the importing country.[3]

When it comes to partner countries, External Merchandise Trade Statistics in Georgia applies the following: the country of consignment in imports and the country of last known destination in exports. The reason that country of consignment is applied in import statistics instead of country of origin is a lack of data quality and data completeness for country of origin in Georgian customs declarations.

Database of Customs Declarations (DBCD) is the main information source on external trade transactions. National Statistics office (NSO) receives DBCD from the Revenue Service of Ministry of Finance of Georgia on a monthly basis. Also Information on gas and electric power is obtained from LTD Georgian Gas Transportation Company, JSC Georgian Oil and Gas Corporation, JSC

[3] "International Merchandise Trade Statistics, Concepts and Definitions, 2010" (United Nations, New York, 2011).

Georgian State Electrosystem and JSC Electricity System Commercial Operator, to complete the data.

4.2. Possible reasons for asymmetries

During mirror analysis in general, only one major methodological problem was identified, namely the application of country of consignment in import statistics instead of country of origin. However, this problem will decrease asymmetries, rather than creating them. For instance, if a Bulgarian enterprise exports a used German car to Georgia, the correct application of Germany as country of origin in Georgian statistics, will create asymmetries with both Germany and Bulgaria. On the contrary, the current application of Bulgaria as partner country in the statistics will not create asymmetries.

On top of the issue related to country of origin/country of consignment, some minor issues were identified which may potentially create asymmetry:

1. **Asymmetries created even with application of a harmonized methodology:**

- ✓ **Volatile Currency** – The Georgien lari (GEL) is a somewhat volatile currency and consequently fluctuations in exchange rates may be behind some part of the asymmetries which can be observed
- ✓ The difference between FOB valuation and CIF valuation produce a small methodological asymmetry between export statistics and import statistics showing the same trade flow.

2. **Asymmetries explained by differences in the methodology:**

- ✓ **Different trade systems** – As was mentioned above, for compilation of External Merchandise Trade statistics Georgia uses the General trades concept. Eurostat, EUs statistical office, apply the Special trade concept in the Comext database containing IMTS data of the EU Member States. Furthermore, many Member States follows the practice of Eurostat and disseminate according to special trade concept in the national IMTS data. This difference in trade concepts can produce asymmetries. Goods going from Georgia to a specific EU Member State might not be included in the IMTS of that Member State because the goods are not recorded in special trade if the goods only enter a custom warehouse in the Member State and leave the warehouse again with a non-EU country or another EU Member State as final destination. Similar, goods from an EU Member State (Member States of consignment) entering Georgia might be recorded in Georgian IMTS as import from that EU Member State, but if the goods are originating from another EU Member State or from a non-EU country and leaving from a customs warehouse in EU Member States of consignment, then this will most likely not be included in the IMTS of the Member States of consignment.

- ✓ **Missing import of cars** - Cars re-exported within 90 days need only be registered at the Service Agency of the Ministry of Internal Affairs within 90 days of their arrival to Georgia. In many cases, the cars are re-exported within these 90 days. In these cases, there will be a re-export declaration, but no import declaration. Consequently, the import of these cars is missing from Georgian import statistics. However, the issue has been identified and work has been commenced to solve the problem by imputing the import based on the re-export declaration.

3. **Asymmetries created by dysfunctions in the collection systems:**

- ✓ **High exemption threshold for export** - A relatively high exemption threshold of GEL10.000 for export declarations is applied by Georgian Customs. In cases, where the importing counterpart is subject to lower exemption threshold, asymmetry will appear.

- ✓ **Transit trade** – some cases may occur when Georgia is recorded as country of origin or country of final destination while in reality the operation is transit trade through Georgia.

- ✓ **Fraudulent underreporting** of export value with a view to evade taxation of profit;

- ✓ **Misclassification of the commodity** during customs procedure.

Asymmetries created even with application of a harmonized methodology (e.g. different trade systems, volatile currency) as well as asymmetries explained by differences in the methodology (e.g. country of consignment instead of country of origin) are both characterized in case of Georgia. However, they should not be considered to be major reasons for the asymmetries.

5. Descriptive analysis on total level

As was already mentioned above, in the process of data analysis, comparisons between Georgia and the EU total as well as each of the EU countries were undertaken. Aggregate-level comparisons (totals by partner, 2- and 4-digit level of Combined Nomenclature) were based on the latest available 2014-2018 data. . For some cases data of 2019 were also analyzed.

Table №1 below shows asymmetries related to total export and import after comparison of Geostat data with Comext database:

Table №1 Comparison of Geostat data and Comext database

Export to EU countries (mil. USD)			Import from EU countries (mil. USD)		
2014	Export to EU (Geostat data)	**624.2**	2014	Import from EU (Geostat data)	**2 372.0**
	Import from Georgia (Comext data)	**875.8**		Export to Georgia (Comext data)	**2 536.4**
	Asymmetry	**-251.6**		Asymmetry	**-164.4**
2015	Export to EU Geostat data)	**644.7**	2015	Import from EU (Geostat data)	**2 082.4**
	Import from Georgia (Comext data)	**816.0**		Export to Georgia (Comext data)	**2 048.5**
	Asymmetry	**-171.3**		Asymmetry	**33.9**
2016	Export to EU	**565.7**	2016	Import from EU (Geostat data)	**2 228.1**
	Import from Georgia (Comext data)	**576.4**		Export to Georgia (Comext data)	**2 178.9**
	Asymmetry	**-10.7**		Asymmetry	**49.2**
2017	Export to EU	**655.4**	2017	Import from EU (Geostat data)	**2 225.0**

Export to EU countries (mil. USD)			Import from EU countries (mil. USD)		
	Import from Georgia (Comext data)	**749.4**		Export to Georgia (Comext data)	**2 279.5**
	Asymmetry	**-94.0**		Asymmetry	**-54.5**
2018	Export to EU	**729.2**	2018	Import from EU (Geostat data)	**2 555.2**
	Import from Georgia (Comext data)	**763.7**		Export to Georgia (Comext data)	**2 496.2**
	Asymmetry	**-34.5**		Asymmetry	**59.0**
2019	Export to EU	**819.2**	2019	Import from EU (Geostat data)	**2 407.2**
	Import from Georgia (Comext data)	**757.6**		Export to Georgia (Comext data)	**2 349.6**
	Asymmetry	**-61.6**		Asymmetry	**57.6**

Source: Geostat data; Comext database

Asymmetries related to total export and import after comparison of Geostat data with UN Comtrade database are presented in table №2

Table №2 Comparison of Geostat data and UN Comtrade database

Export to EU countries (mil. USD)			Import to EU countries (mil. USD)		
2014	Export to EU (Geostat data)	**624.2**	2014	Import from EU (Geostat data)	**2 372.0**
	Import from Georgia (UN Comtrade data)	**862.0**		Export to Georgia (UN Comtrade data)	**2 528.8**
	Asymmetry	**-237.8**		Asymmetry	**-156.8**
2015	Export to EU (Geostat data)	**644.7**	2015	Import from EU (Geostat data)	**2 082.4**
	Import from Georgia (UN Comtrade data)	**794.5**		Export to Georgia (UN Comtrade data)	**2 041.6**
	Asymmetry	**-149.8**		Asymmetry	**40.8**
2016	Export to EU (Geostat data)	**565.7**	2016	Import from EU (Geostat data)	**2 228.1**
	Import from Georgia (UN Comtrade data)	**570.0**		Export to Georgia (UN Comtrade data)	**2 174.1**
	Asymmetry	**-4.3**		Asymmetry	**54.0**
2017	Export to EU (Geostat data)	**655.4**	2017	Import from EU (Geostat data)	**2 225.0**
	Import from Georgia (UN Comtrade data)	**747.5**		Export to Georgia (UN Comtrade data)	**2 273.9**
	Asymmetry	**-92.1**		Asymmetry	**-48.9**
2018	Export to EU (Geostat data)	**729.2**	2018	Import from EU (Geostat data)	**2 555.2**
	Import from Georgia (UN Comtrade data)	**761.8**		Export to Georgia (UN Comtrade data)	**2 460.8**
	Asymmetry	**-32.6**		Asymmetry	**94.7**
2019	Export to EU (Geostat data)	**819.2**	2019	Import from EU (Geostat data)	**2 407.2**
	Import from Georgia (UN Comtrade data)	**756.8**		Export to Georgia (UN Comtrade data)	**2 341.2**
	Asymmetry	**92.4**		Asymmetry	**66.0**

Source: Geostat data; UN Comtrade database

Total asymmetries compiled during comparison of external trade data of Geostat with Comext and Comtrade databases are presented on the charts (№1 and №2) below:

Chart 1. Asymmetries related to Georgian exports to EU countries (mil. USD)

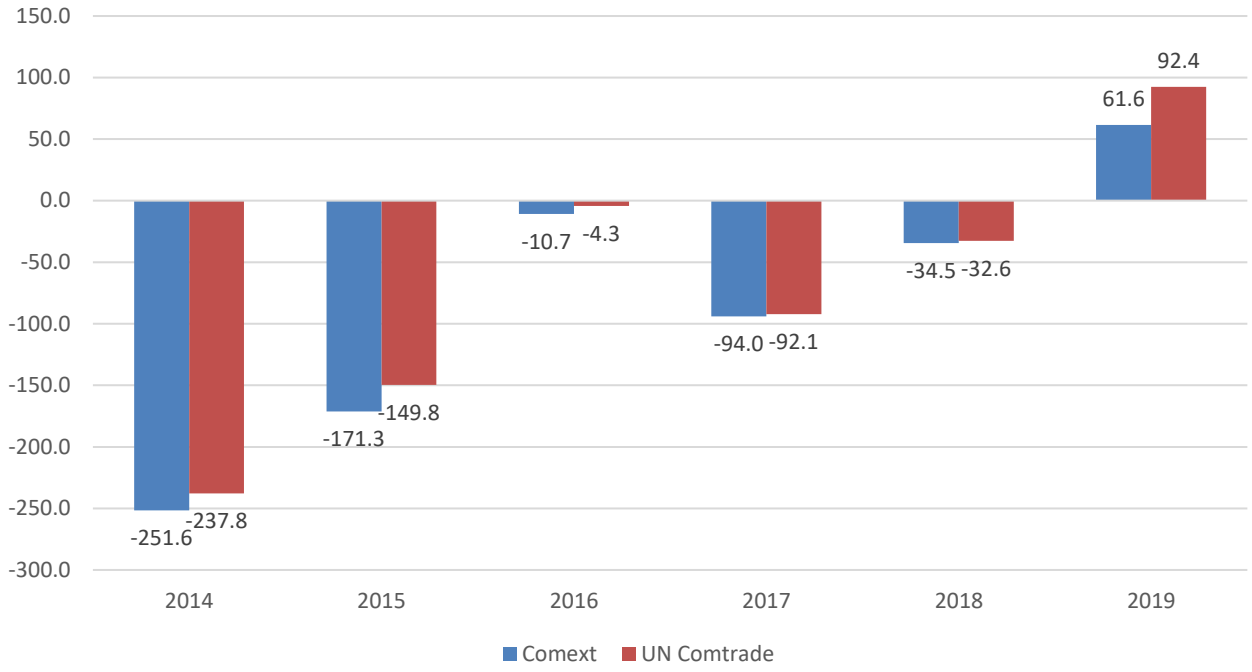
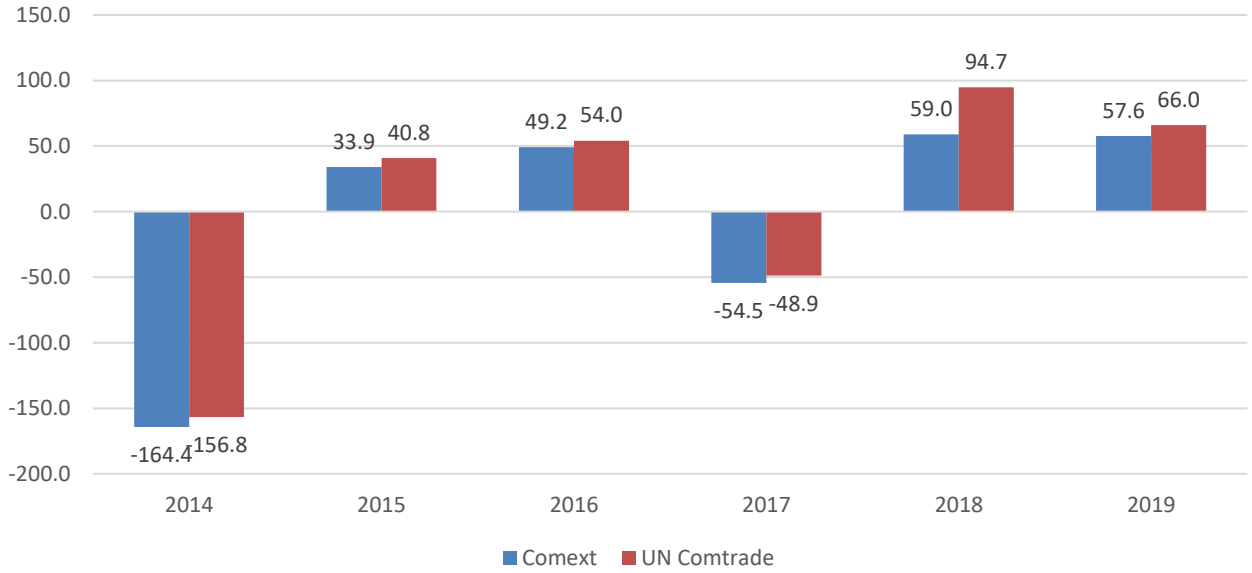


Chart 2. Asymmetries related to Georgian imports from EU countries (mil. USD)



It should be noted that despite the dissemination of IMTS data under different trade regimes (data presented in Comext database are compiled according to Special trade regime, while General trade regime is applied to data published by UN Comtrade), asymmetries compiled from the both data sources have similar tendencies.

As comparison on total level shows, asymmetry concerning total export is consistent and it is negative through 2014-2018 period i.e. export recorded by Georgia to EU countries is less than the value of import from Georgia reported by EU countries. However, it changes to positive (i.e. export to EU countries recorded by Georgia exceeds the import from Georgia reported by EU countries) in 2019.

As for import, asymmetry was negative in 2014 and 2017 (i.e. import from EU countries recorded by Georgia is less than export to Georgia reported by EU countries) and was positive in 2015-2016 and in 2018-2019 (i.e. import from EU countries recorded by Georgia exceeds the export to Georgia reported by EU countries).

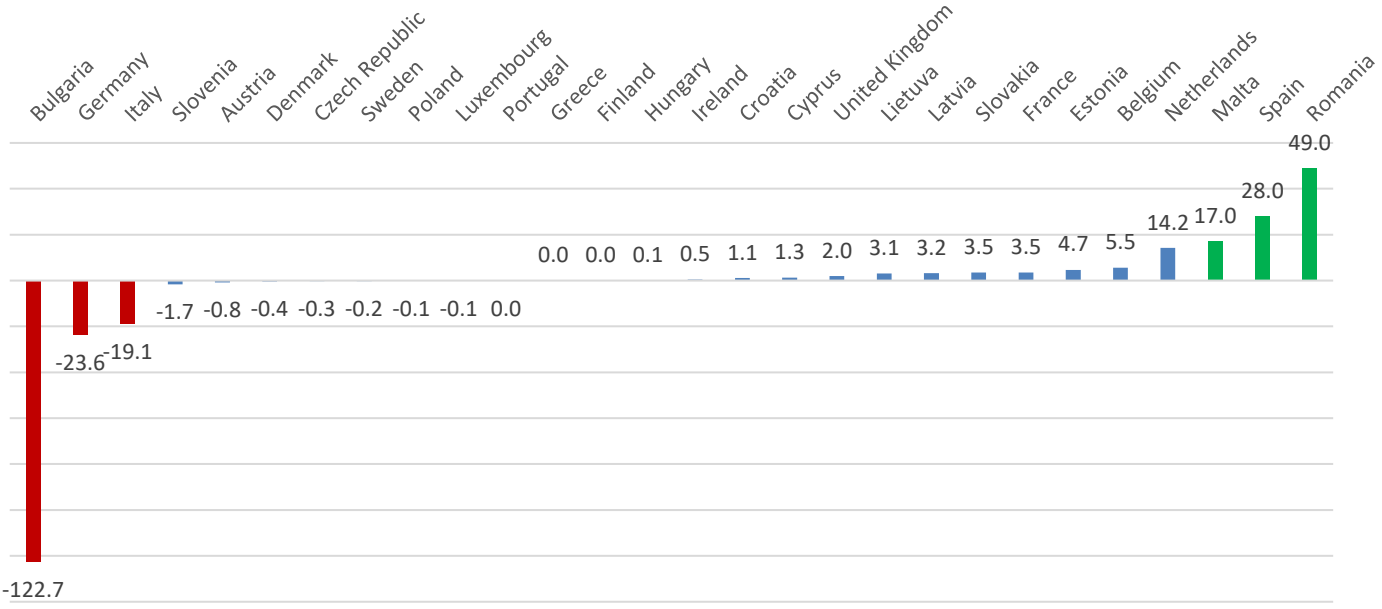
It should be noted that the relative asymmetry is much higher for export than for import.

After overviewing differences on total level more detailed compilations were made. Asymmetries were calculated based on data of 2018 as it was the latest available data when in-depth analysis was started.

Asymmetries in 2018 by EU-member countries breakdown are presented on the charts (№3 and №4) below:

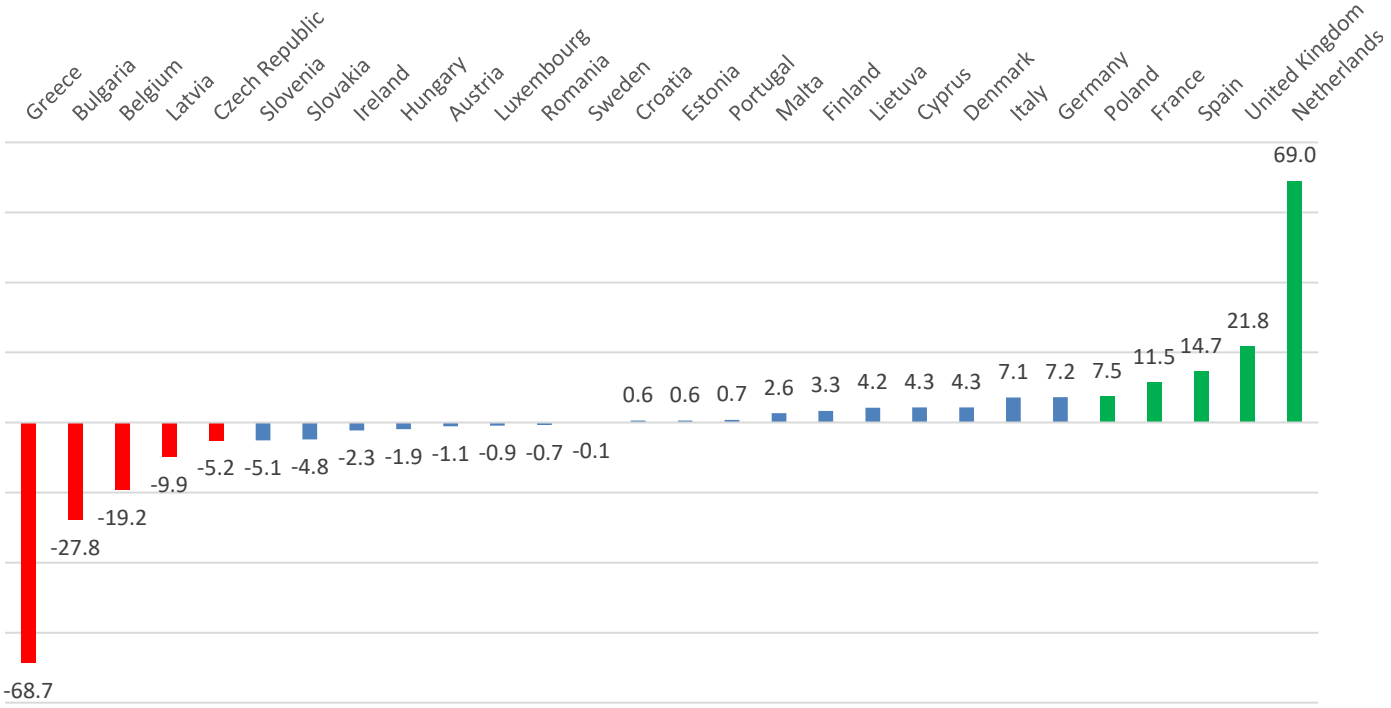
Chart 3. Asymetries by Georgian Exports to EU Countries in 2018

(Mln. USD)



Source: Geostat data; Comext database.

Chart 4. Asymetries by Georgian Imports from EU Countries in 2018
(Mln. USD)



Source: Geostat data; Comext database

Major asymmetries in 2018 by commodity groups on 4 digit level of combined nomenclature (HS 2012-2017) are presented in the following tables (tables №3 and №4):

Table №3. Asymmetries Related to Georgian Export to EU countries (1000 USD)

HS 4 Digit	Name of Commodity	2014	2015	2016	2017	2018
2709	Crude petroleum and petroleum oils	-104 814.1	-19 450.3	15 335.7	9 271.2	-34 098.8
7402	Unrefined copper; copper anodes for electrolytic refining	-7 302.5	0.0	-4 859.8	-15 915.1	-20 791.5
6109	T-shirts and other vests, knitted or crocheted	-24 013.7	-10 407.5	-15 331.8	-19 409.7	-16 260.2
6307	Other made up articles, including dress patterns	-16.9	-393.8	-2 914.6	-6 850.8	-8 286.1
6104	Women's or girls' suits, jackets, shorts and other clothes, knitted or crocheted	-6 241.4	-4 943.4	-2 828.8	-4 335.2	-6 059.7
3102	Mineral or chemical fertilizers, nitrogenous	-6 530.1	-10 351.7	-6 837.0	-10 802.0	-5 874.1
2603	Copper ores and concentrates	39 561.8	3 776.8	31 218.2	-40 841.0	-4 951.7
2008	Fruit, nuts and other edible parts of plants, otherwise prepared or preserved	-409.0	-1 880.9	-3 972.7	-9 211.6	-3 547.4
2207	Undenatured ethyl alcohol and other spirits, denatured, of any strength	0.0	0.0	0.0	700.2	3 080.6
2208	Undenatured ethyl alcohol, spirits, liqueurs and other spirituous beverages	4 940.6	5 257.3	10 905.2	7 194.5	4 753.9

HS 4 Digit	Name of Commodity	2014	2015	2016	2017	2018
7700	Mixed goods	6 582.0	5 381.9	5 354.5	6 488.2	7 194.7
8703	Motor cars	32 153.7	9 837.6	4 014.3	9 935.8	9 221.1
4421	Other articles of wood	-35.0	965.9	7 918.1	9 496.8	9 552.1
2710	Petroleum and petroleum oils	-141 363.5	-96 174.7	-9 001.5	-23 229.9	12 593.9
4011	New pneumatic tyres, of rubber	9 485.6	9 442.8	339.3	9 921.6	15 596.7

Source: Geostat data, UN Comtrade database.

Table №4. Asymmetries Related to Georgian Import from EU countries (1000 USD)

HS 4 Digit	Name of Commodity	2014	2015	2016	2017	2018
2710	Petroleum and petroleum oils	-118 897.0	-46 514.0	-59 523.2	-137 297.3	-85 650.6
3004	Medicaments put up in measured doses	-32 172.1	-26 267.2	-54 098.1	-18 200.0	-31 011.8
2208	Undenatured ethyl alcohol, spirits, liqueurs and other spirituous beverages	-9 766.0	-882.7	-13 404.7	-18 231.0	-20 313.2
2818	Aluminium oxide; aluminium hydroxide	-10 894.0	-2 606.9	-2 208.4	-639.8	-18 243.7
9999	Commodities not specified according to kind	-17 826.3	-26 377.4	-20 897.3	-12 161.9	-17 282.1
9023	Instruments, apparatus and models, designed for demonstrational purposes	-137.7	85.5	-364.2	759.6	-15 859.0
6907	Unglazed ceramic flags and paving, hearth or wall tiles; mosaic cubes and the like	-639.3	-300.0	-190.9	-10 733.8	-11 399.5
8471	Automatic data processing machines and units thereof	10 012.3	4 654.5	8 749.8	11 534.8	8 246.2
8701	Tractors	3 656.3	3 698.5	3 065.5	3 902.5	8 289.5
2207	Undenatured ethyl alcohol and other spirits, denatured, of any strength	2 199.5	335.2	1 148.3	2 986.6	11 291.2
6908	Glazed ceramic flags and paving, hearth or wall tiles; mosaic cubes and the like	1 408.7	2 478.5	2 148.7	12 232.2	13 188.9
0207	Meat and edible offal, of the poultry, fresh, chilled or frozen	3 283.7	9 132.7	8 925.5	12 162.0	13 367.7
8411	Turbo-jets, turbo-propellers and other gas turbines	-33.6	-3 919.7	251.6	2 636.3	14 065.2
8704	Motor vehicles for the transport of goods	17 756.3	16 540.9	16 491.4	17 931.8	16 789.2
9801	Parts of motor cars from the group 87	25 585.6	18 192.0	14 524.4	18 746.9	18 290.2

Source: Geostat data, UN Comtrade database

However, when asymmetries are calculated on several components (by commodity, by country, etc.) rough discrepancy on aggregated level between the values of reporter and partner countries is not enough and may even be misleading as argued in section 3.5. Therefore, absolute asymmetries were analysed.

Calculation was applied on partner country and HS 6-digit commodity code combination and top totals were identified according to largest asymmetries. UN Comtrade database was decided to be used as data source instead of Comext data due to the fact that extraction of large amount of detailed data were related to several restrictions (e.g. selection of all HS 6-digit level commodity codes at once were disabled) in Comext database.

The results of compilation are presented in the tables below:

Table №5. Asymmetry by Export to EU in 2018 (mil. USD)

Total Georgian export	730.7
Total EU import	838.7
Total asymmetry	-108.0
Total absolute asymmetry	598.7

Source: UN Comtrade database

Table №6. Asymmetry by Import from EU in 2018 (mil. USD)

Total Georgian import	2 506.1
Total EU export	2 472.3
Total asymmetry	33.8
Total absolute asymmetry	1 507.7

Source: UN Comtrade database

In these tables, 'Total asymmetry' shows the asymmetry between the EU and Georgia based on aggregated data. As shown in section 3.5, this approach may hide asymmetries which have different signs and therefore cancel out each other. Therefore the sum of absolute asymmetries on HS6-country-combinations is also shown under 'Total absolute asymmetry'. To make it clear how the data appear, the following example can be given:

Code	Gergian export to DK	Georgian export to LT	DK import from Georgia	LT import from Georgia	Asymmetry	Absolute asymmetry
1	200		50		150	150
2	100		125		-25	25
3		100		100	0	0
4		100		150	-50	50
Aggregated Georgian export				500		
Aggregated EU import				425		
Total asymmetry on aggregated level				75		
Total absolute asymmetry (150+25+0+50):				225		

Table №7 shows an analysis of the HS6-level country-commodity combinations in Georgian exports to EU which have the largest asymmetries.

Table №7. Top totals according to asymmetry by export to EU in 2018

Number of top totals (country-commodity combination)	Absolute asymmetry, mil. USD	Share	Asymmetry, mil. USD	Share
3	165.5	27.6%	-64.2	59.4%
10	286.8	47.9%	-74.4	68.9%
20	342.3	**57.2%**	-103.6	96.0%
30	372.4	62.2%	-92.2	85.4%
40	395.6	66.1%	-91.5	84.8%
50	414.6	69.3%	-91.6	84.9%
100	476.2	79.5%	-88.1	81.6%

Source: UN Comtrade database.

The table should be read as follows. The three largest absolute asymmetries on the level of HS6-country-combination amount to a total absolute asymmetry of USD 165.5 million. This makes up 27.6% of the total absolute asymmetry in the data set. The total (not absolute) asymmetry in the top 3 amounts to USD -64.2 million. This makes up 59.4% of the total (not absolute) asymmetry in the data set.

As table №7 indicates rather few HS6-country-combinations are the cause of a relatively large share of the total asymmetry by Georgian export to EU countries, e.g. in depth analysis of top 20 totals (country-commodity combination) and finding main reasons causing asymmetries will cover 57.2% of total absolute asymmetry.

Combinations of country and commodity which produce the largest asymmetries in the Georgian imports from EU are presented in table №8.

Table №8. Top totals according to asymmetry by import from EU in 2018

Number of top totals (country-commodity combination)	Absolute asymmetry, mil. USD	Share	Asymmetry, mil. USD	Share
3	186.5	12.4%	50.6	149.7%
10	307.0	20.4%	-20.2	-59.8%
20	384.5	**25.5%**	-3.8	-11.2%
30	438.7	29.1%	-15.1	-44.6%
40	477.5	31.7%	-17.0	-50.2%
50	509.7	33.8%	-10.5	-31.0%
100	635.4	42.1%	-25.1	-74.1%

Source: UN Comtrade database

Similar to table №7, top 20 totals (country-commodity combination) from table №6 cover 25.5% of total absolute asymmetry related to import of Georgia from EU countries.

Thus, the asymmetry investigation can focus on these country-commodity combinations causing large asymmetries.

Main criteria for the choice of asymmetries for further examination was based on the following characteristics:

- ✓ Preference according to the largest asymmetries;
- ✓ Periodicity of asymmetry – high frequency;
- ✓ Asymmetry with one country on several goods.

With this approach following major countries and commodities were selected for further investigation:

Major countries:

- ✓ Romania
- ✓ Bulgaria
- ✓ Greece
- ✓ Italy
- ✓ Netherlands
- ✓ Germany

Major commodities:

- ✓ HS code 260300 - Copper Ores and Concentrates;
- ✓ HS code 2709 - Crude Petroleum and Petroleum Oils;
- ✓ HS codes 271012 and 271019 - Petroleum Oils and Oils from Bituminous Minerals;
- ✓ HS code 7402 - Unrefined copper; Copper Anodes for Electrolytic Refining
- ✓ HS code 271019210 - Jet fuel.

After compilation procedures six letters were prepared for selected partner countries. Brief overview of current project, issues identified and main findings concerning possible reasons of asymmetries were described in each letter addressed to statistical institutions of relevant countries together with request to for further support and cooperation which will determine better analyses of specific examinations and clarify main reasons causing asymmetries.

6. Results of specific examinations

6.1 Asymmetry studies with Bulgaria

Bulgaria was one of the countries selected for asymmetry studies concerning bilateral trade of Georgia with EU member countries.

Concerning the largest asymmetries at product level, bilateral trade with several commodities were extremely interesting for investigation. Main findings and potential explanations for the existing asymmetries are presented below, for each commodity group:

Copper Ores and Concentrates (HS code 260300)

According to findings related to mirror comparison, concerning **Copper Ores and Concentrates** (HS code 260300) asymmetry of Georgia with Bulgaria vary from negative (Georgian export is smaller than Bulgarian import) in 2017-2018 to positive (Georgian export is bigger than Bulgarian import) in 2016 and 2019. However, the figures are not balanced due to the high level of asymmetry in 2017-2018. It is also noteworthy that the reason for small positive asymmetries in 2016 and 2019 may be the difference in recording time. As for the period 2017-2018, the probable causes are different and the asymmetry does not fit into the logic of a normal error.

Asymmetries with Bulgaria concerning Copper Ores and Concentrates are presented in the table below:

Table №12. Asymmetry of Georgia with Bulgaria in 2016-2019
(concerning Copper Ores and Concentrates - HS code 260300)

Export of 260300 to Bulgaria (Geostat data)			**Import of 260300 from Georgia to Bulgaria (Comext)**		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	134,588.8	137,094.4	120,437.0	133,980.4	14,151.7	3 114.0
2017	164,860.8	142,294.1	295,159.0	209,492.2	-130,298.2	-67 198.1
2018	242,025.9	159,057.5	319,458.4	210,752.0	-77,432.5	-51 694.5
2019	263,608.9	42,331.7	253,334.7	147,987.9	10,274.2	-105 656.2

Source: Geostat data, Comext database

Potential explanation for the asymmetry was identified during in-depth analysis. According to main findings, a quite large part of Copper Ores and Concentrates from Caucasus countries destined to Bulgaria, are in **transit** through Georgia. Apart from this, some ores and concentrates (originated from other Caucasus country) are being **processed** in Georgia and afterwards exported to Bulgaria. However, Bulgaria records all these goods as imported from Georgia.

Transit declarations from the Georgian Database of Customs Declarations (DBCD) were examined by Geostat. According to these declarations, transit of copper ores and concentrates originated from Armenia, is recorded through Georgian ports to Bulgaria. However, Bulgaria does not record import from Armenia according to the data from Comext database. In addition, according to the Comext data, a minor part of the Georgian copper ores and concentrates are exported to Bulgaria by sea and Armenia is recorded as a country of consignment. Obviously, this could not be considered

correct, because geographically Georgia is connected to Bulgaria by sea, and consequently, goods leaving from Georgia will not pass through Armenia to get to Bulgaria. Therefore, it is possible that, at the customs of Bulgaria, Georgia is recorded wrongfully as a country of origin for copper ores and concentrates that are actually originated from Armenia.

Table №13. Import of Copper Ores and Concentrates of Bulgaria from Georgia

Reporter	Partner	Country of Consignment	2018	
			1000 USD	Tons
	Total		**370,330.6**	**248,664.4**
	Of which:			
Bulgaria	Georgia	Georgia	307,104.7	199,823.9
Bulgaria	Georgia	Armenia	12,353.7	10,928.1

Source: Comext database

Moreover, a mirror asymmetry (as defined in section 3.6) between Armenia and Bulgaria has been identified:

Table №14. Asymmetry of Bulgaria with Armenia in 2016-2019
(concerning Copper Ores and Concentrates - HS code 260300)

Export of 260300 to Bulgaria from Armenia			**Import of 260300 from Armenia to Bulgaria**		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	163,039.4	181,118.9	-	-	163,039.4	181,118.9
2017	281,210.6	226,553.7	-	-	281,210.6	226,553.7
2018	213,922.2	200,774.1	-	-	213,922.2	200,774.1
2019	205,827.9	226,592.8	-	-	205,827.9	226,592.8

Source: UN Comtrade database

As can be seen from the table, Armenia exports copper to Bulgaria, while Bulgaria does not record import. The strengthens the assumption that some of the import which Bulgaria records as import from Georgia is really import from Armenia, which is only in transit through Georgia.

Crude Petroleum and Petroleum Oils (HS code 2709)

According to findings related to analyzing Geostat data and Comext database concerning bilateral trade with **Crude Petroleum and Petroleum Oils** (HS code 2709) Georgia shows negative asymmetry with Bulgaria e.i. Georgian export is smaller than Bulgarian import. Persistent negative asymmetries of Georgia with Bulgaria between 2016-2019 are presented in the table below:

Table №15. Asymmetry of Georgia with Bulgaria Concerning Crude Petroleum and Petroleum Oils

Export to Bulgaria (Geostat data)			Import from Georgia (Comext)		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	4,370.8	17,013.3	6,232.6	33,890.7	-1,861.8	-16,877.4
2017	2,357.4	6,735.5	10,863.1	29,036.5	-8,505.7	-22,301.0
2018	-	-	37,491.7	81,407.1	-37,491.7	-81,407.1
2019	-	-	41,412.2	82,172.4	-41,412.2	-82,172.4

Source: Geostat data, Comext database

Potential explanation for the asymmetry was identified – Georgia is wrongfully reported as country of origin by Bulgaria. It is highly possible that the crude petroleum and petroleum oils exported to Bulgaria belongs to Turkmenistan (in 2017) and Azerbaijan (in 2018-2019) and these goods are only in **transit** through Georgia. The fact that Bulgaria reports Azerbaijan and Turkmenistan as countries of consignment while importing from Georgia in 2017-2019 also supports the mentioned assumption (please find table table №16 below):

Table №16. Import of Crude Petroleum and Petroleum Oils

Year	Reporter	Country of Origin	Country of Consignment	1000 USD	1000 EUR	Tons
2016	Bulgaria	Georgia	GEORGIA	6,232.6	5,630.7	33,890.7
2017	Bulgaria	Georgia	Turkmenistan	10,863.1	9,615.9	29,036.5
2018	Bulgaria	Georgia	Azerbaijan	37,491.7	31,745.8	81,407.1
2019	Bulgaria	Georgia	Azerbaijan	41,412.2	36,991.7	82,172.4

Note:

Year	EURO to USD exchange rate
2016	1.107
2017	1.130
2018	1.181
2019	1.120

Source: Comext database

Petroleum Oils and Oils from Bituminous Minerals (HS code 271012)

According to findings related to analyzing Geostat data and Comext database concerning the bilateral trade with **Petroleum Oils and Oils from Bituminous Minerals** (HS code 271012), Georgia shows negative asymmetry with Bulgaria in 2017-2019 e.i. Georgian import is smaller than Bulgarian export. Asymmetries of Georgia with Bulgaria for 2016-2019 period are presented in the table below:

Table №17. Asymmetry of Georgia with Bulgaria in 2016-2019

(concerning Petroleum Oils and Oils from Bituminous Minerals - HS code 271012)

Year	**Import from Bulgaria (Geostat), 1000 USD**	**Export to Georgia (Comext), 1000 USD**	Asymmetry, 1000 USD
2016	58,518	56,342	2,176
2017	62,917	90,381	-27,464
2018	66,970	78,627	-11,657
2019	39,819	41,142	-4,322

Source: Geostat data, Comext database

A potential explanation for the asymmetry could be **transit**. Georgia is wrongfully reported as country of destination by Bulgaria while actually goods are destined for Azerbaijan and Armenia. According to the data from UN Comtrade database Bulgaria has negative mirror asymmetries in bilateral trade with HS 271012 with Azerbaijan i.e., export of Bulgaria to Azerbaijan is smaller (or not reported at all in 2016-2017) than import of Azerbaijan from Bulgaria. As for Armenia it should be noted that Bulgaria does not report trade with HS 271012 with Armenia, while Armenia reports it (please see tables №18 and №19 below):

Table №18. Asymmetry of Bulgaria with Azerbaijan in 2016-2019

(concerning Petroleum Oils and Oils from Bituminous Minerals - HS code 271012)

Year	**Export of Bulgaria to Azerbaijan**		**Import of Azerbaijan from Bulgaria**		**Asymmetry**	
	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	-	-	2,011.6	3,512.2	-2,011.6	-3,512.2
2017	-	-	22,887.1	35,295.7	-22,887.1	-35,295.7
2018	3,245.7	4,461.9	5,633.4	7,025.2	-2,387.7	-2,563.3

Source: UN Comtrade database

Table №19. Import of Petroleum Oils and Oils from Bituminous Minerals by Armenia from Bulgaria in 2016-2019

Year	1000 USD	Tons
2016	14,793.0	20,434.2
2017	18,556.0	26,136.7
2018	15,675.2	19,026.2
2019	6,590.6	8,755.9

Source: UN Comtrade database

The existence of these mirror asymmetries between Bulgaria and Armenia/Azerbaijan further supports the thesis that transit is the reason behind the asymmetry between Bulgaria and Georgia.

After analyzing potential reasons causing asymmetries, special letter was prepared under the guidance of experts from Statistics Denmark. The aim of Twinning project, compilations made and main findings concerning reasons for asymmetries were described in the letter which was sent to

National Statistics Institute of Bulgaria together with request for further support and cooperation which will determine better analyses of specific examinations and clarify main reasons causing asymmetries.

According to the response received from National Statistics Institute of Bulgaria probable explanation for the asymmetries could be transit or wrong declaration of country of origin/country of consignment. However, in order to study the issue in more depth, cooperation with Bulgarian Customs Agency and main exporter/importer companies of the country is needed which takes considerable time.

6.2 Asymmetry studies with Greece

Bilateral trade between Georgia and Greece with **Jet Fuel** was one of the main issues to study concerning the largest asymmetries by country and product level.

Greece reports export of Jet Fuel (HS code 27101921) to Georgia, while Georgia records import from Greece. However, analysis of Geostat data and Comext database figures shows that Georgia mainly has negative asymmetry with Greece, i.e. Georgian import is smaller than Greek export. Negative asymmetries concerning Jet Fuel for 2016-2019 period are presented in the table below:

Table №20. Negative asymmetries concerning Jet Fuel (HS code 271019210) for 2016-2019

Import of Jet fuel from Greece (Geostat data)			**Export of Jet fuel from Greece to Georgia (Comext data)**		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	541.6	1,253.9	14,927.7	36,975.8	-14,386.1	-35,721.9
2017	13,000.1	22,182.1	90,537.1	165,062.8	-77,537.1	-14, 2881
2018	23,922.4	32,378.7	92,823.5	131,194.3	-68,901.1	-98, 815.6
2019	1,154.9	1,662.3	29,507.6	45,714.0	-28,352.7	-44,051.7

Source: Geostat data, Comext database

Two potential explanations for the asymmetry were identified:

1. **Transit**

Transit declarations from the Georgian Database of Customs Declarations (DBCD) were examined by Geostat. According to these declarations, Greece transits commodity under HS 27101921 code to Ukraine through Georgia. We have analyzed asymmetries between Ukraine and Greece as well. According to the UN Comtrade data presented in the table №21, Ukraine shows positive asymmetries (Import of Ukraine is bigger than export of Greece) with Greece in 2017-2018.

Table №21. Asymmetries between Ukraine and Greece concerning Jet Fuel for 2016-2019

Year	Import of Jet Fuel of Ukraine from Greece		Export of Jet Fuel from Greece to Ukraine		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	139,093.3	305,534.6	156,080.6	347,898.5	-16,987.3	-42,363.9
2017	115,028.9	228,016.7	60,235.5	111,985.7	54,793.4	11,6031
2018	144,255.1	194,107.4	137,523.0	209,019.2	6,732.2	-14,911.8
2019	No data	No data	135,230.0	217,980.5		

Source: UN Comtrade database

Therefore, it could be that Greek export destined for Ukraine is wrongfully declared with Georgia as country of destination.

2. **Intermediate consumption**

After analyzing potential reasons causing asymmetries, special letter was prepared under the guidance of experts from Statistics Denmark. The aim of Twinning project, compilations made and main findings concerning reasons for asymmetries were described in the letter which was sent to Hellenic Statistical Authority – ELSTAT together with request for further support and cooperation which will determine better analyses of specific examinations and clarify main reasons causing asymmetries. However, the answer was not received and the best possible conclusion was that:

Commodity under HS 27101921 code is Jet Fuel used by aircraft during flights. Consequently, it is possible that the mentioned fuel is supplied to Georgian aircrafts in Greek airports. In that case, we expect Greek statistics to show export, while Georgian statistics does not record this fuel as import because of lack of data sources.

6.3 Asymmetry studies with Italy

Asymmetry studies with Italy covered bilateral trade with **Petroleum Oils and Oils from Bituminous Minerals** (HS 6-digit code 271019). Based on various data sources (Geostat data, Comtrade and Comext databases) Italy reports large import of Fuel Oil (under HS code 271019) from Georgia, which does not match the data that Georgia records and therefore, asymmetries are formed.

According to findings related to mirror comparison data were mainly balanced and no large asymmetries were found due to small value of transactions in 2016-2017. However, the situation had changed roughly and large negative asymmetries occurred in 2018-2019 i.e., Georgian export is smaller than Italian import. Negative asymmetries concerning 271019 for 2016-2019 period are presented in the table below:

Table №22. Asymmetries concerning Petroleum Oils and Oils from Bituminous Minerals (HS code 271019) for 2016-2019

Export of 271019 to Italy (Geostat data)			Import of 271019 from Georgia to Italy (Comext)		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	151.3	620.0	989.6	3,012.0	-838,3	-2,392.0
2017	9,006.7	31,633.7	7,497.2	18,670.5	1,509.5	12,963.2
2018	0.6	0.0	16,904.8	30,367.8	-16,904.2	-30,367.8
2019	1,040.4	2,481.8	15,192.8	32,923.0	-14,152.4	-30,441.2

Source: Geostat data, Comext database

Two potential explanations were identified for the asymmetry:

1. **Transit**

Transit declarations from the Georgian Database of Customs Declarations (DBCD) were examined. According to these declarations, Fuel Oil is imported from Azerbaijan, Turkmenistan and Kazakhstan to Italy through Georgia. Data from Comext database (presented in table №23) support this judgment:

Table №23. Import of Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel to Italy through Georgia

Reporter	Country of Origin	Country of Consignment	2018		2019	
			1000 USD	Tons	1000 USD	Tons
	Total		**52,267.8**	**100,621.2**	**94,035.5**	**197,086.3**
	Of which:					
Italy	Kazakhstan	Georgia	3,666.4	7,832.5	-	-
Italy	Turkmenistan	Georgia	12,983.8	27,756.2	16,469.1	34,513.8
Italy	Georgia	Georgia	16,904.8	30,367.6	15,192.8	32,923.0
Italy	Azerbaijan	Georgia	18,712.8	34,664.9	62,373.6	129,649.5

Source: Comext database

Analysis of the figures presented in tables №22 and №23 shows that Georgia reports relatively small export of Petroleum Oils and Oils from Bituminous Minerals to Italy (600 USD in 2018 and 1.0 million USD in 2019 (table №22), while import from Georgia recorded by Italy is quite high (16.9 million USD in 2018 and 15.2 million USD in 2019 (table №23). As Italy reports import from Kazakhstan, Turkmenistan and Azerbaijan through Georgia as well there is a high possibility that large part of import from Georgia declared by Italy is actually not a Georgian commodity thus it the part of transit through Georgia from either three countries mentioned above.

Asymmetries between Azerbaijan/Kazakhstan/Turkmenistan and Italy concerning Petroleum Oils and Oils from Bituminous Minerals are presented in the table below:

Table №24. Asymmetries concerning Petroleum Oils and Oils from Bituminous Minerals (HS code 271019) in 2018-2019

	Export to Italy		Import of Italy		Asymmetry	
	2018	2019	2018	2019	2018	2019
Azerbaijan	19 573.2	58 856.9	18 728.6	62 379.2	844.5	-3 522.3
Kazakhstan	57 457.3	38 842.7	22 922.9	0.0	34 534.4	38 842.7
Turkmenistan			47 831.9	16 470.6	-47 831.9	-16 470.6

Source: UN Comtrade database

As table №24 shows Kazakhstan has positive asymmetry with Italy (e.i. export of Petroleum Oils and Oils from Bituminous Minerals reported by Kazakhstan to Italy is quite high compared to the import from Kazakhstan recorded by Italy). This support the hypothesis proposed above that part of transit declared as import from Georgia by Italy, could actually be import from Kazakhstan.

2. **Asymmetry with Malta**

It is noteworthy that until 2018 Georgia also had an asymmetry of these commodities with Malta, which is EU member country as well, but the asymmetry was positive unlike the case with Italy. In particular, Georgia recorded export of Fuel Oil to Malta, while Malta did not record imports from Georgia. Please, find table №25 below:

Table №25. Asymmetry with Malta in 2016-2019

Export of 271019 to Malta (Geostat data)			**Import of 271019 from Georgia to Malta (Comext)**		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	1,295.7	7,300.2	-	-	1,295.7	7,300.2
2017	19,079.4	84,170.6	-	-	19,079.4	84,170.6
2018	16,326.8	43,567.6	-	-	16,326.8	43,567.6
2019	0.0	0.0	-	-	0.0	0.0

Source: Geostat data, Comext database

Although Georgia records export of 271019 to Malta, transit is carried out from Turkmenistan and Kazakhstan as well to Malta through Georgia. However, Malta does not record the corresponding amount of imports from any of the mentioned countries. Since the location of Malta and Italy are quite close to each other, there is a possibility that commodity may have passed through Italy to Malta or vice versa via Malta to Italy and wrongful declaration of country of destinations could take place at the customs of any of these countries.

This assumption can be substantiated with the asymmetries between Italy and Malta itself, which are presented in the table below:

Table №26. Asymmetry of 271019 between Italy and Malta in 2016-2019

Import of 271019 of Malta from Italy			Export of 271019 from Italy to Malta		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	419,512.0	1,350,765.6	262,112.5	879,477.2	157,399.5	471,288.4
2017	406,964.3	1,122,745.3	295,729.0	735,204.8	111,235.3	387,540.5
2018	626,623.0	1,108,853.5	384,212.6	728,940.7	242,413.4	379,912.8
2019	386,906.5	758,048.0	248,045.9	485,679.7	138,860.6	272,368.3

	Export of 271019 from Malta to Italy		Import of 271019 of Italy from Malta		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	107,800.4	319,087.9	67,028.4	185,081.3	40,772.0	134,006.6
2017	281,944.5	511,216.7	185,760.8	376,058.0	96,183.7	135,158.7
2018	195,585.2	260,075.6	68,353.7	101,372.7	27,231.5	158,702.9
2019	77,133.4	126,300.4	31,567.9	65,637.4	45,565.5	60,663.0

Source: Comext database

Analysis of data shows that Georgia has negative asymmetry with Italy (Georgian export is smaller than Italian import) and positive asymmetry with Malta (Georgia recorded export to Malta, while Malta did not record imports from Georgia). While Malta has positive asymmetry with Italy (export/import to/from Italy recorded by Malta is higher compared to the respective figures recorded by Italy). Thus there could be the possibilities that:

a) Export from Georgia (or export from Turkmenistan and Kazakhstan through Georgia) destined to Malta but passed through Italy is recorded by Italy;
b) Malta is recorded as a country of final destination for export from Georgia (or export from Turkmenistan and Kazakhstan through Georgia) while goods pass through Malta and are destined to Italy.

Georgian enterprises exporting and transiting to Malta and Italy are hired by an international company to carry out these transactions. They guide with the documents provided by the customer when indicating the country of destination at the Georgian customs and do not have any information whether goods sent to Malta or to Italy are destined for other EU member country.

After analyzing potential reasons causing asymmetries, special letter was prepared under the guidance of experts from Statistics Denmark. The aim of Twinning project, compilations made and main findings concerning reasons for asymmetries were described in the letter which was sent to National Institute of Statistics – ISTAT together with request for further support and cooperation which will determine better analyses of specific examinations and clarify main reasons causing asymmetries. According to the representatives of ISTAT import declarations of Fuel Oil from Georgia were reviewed for the reference years 2018 and 2019. As occurred “country of origin” was misreported in declarations. After examining the declarations in more details colleagues from ISTAT confirmed that the right country of origin was Azerbaijan.

6.4 Asymmetry studies with Netherlands

Among other main partner EU countries one of the largest asymmetries are generated in the trade with the Netherlands. External trade data produced and disseminated by Geostat differs with the data Netherlands reported for the two main international trade statistics databases such as **UN Comtrade** and **Comext**.

Asymmetry studies with Netherlands at product level covered bilateral trade with **Petroleum Oils and Oils from Bituminous Minerals** (HS 6-digit code 271019). Netherlands reports large export of Medium oils and preparations, of petroleum or bituminous minerals, n.e.s (under HS code 27101929) to Georgia, which does not match the data that Georgia records. Therefore, asymmetries are formed. According to findings related to mirror comparison, Georgia shows mainly negative asymmetry with Netherlands, i.e. Georgian import is smaller than Dutch export. Negative asymmetries concerning 271019 for 2016-2019 period are presented in the table below:

Table №27. Asymmetries Concerning HS 271019 with Netherlands in 2016-2019

Import of 271019 from Netherlands (Geostat data)			Export of 271019 from Netherlands to Georgia (Comext)		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	1,586.1	781.3	20,437.3	33,701.7	-18,851.1	-32,920.4
2017	2,688.1	3,018.4	29,193.4	38,481.4	-26,505.3	-35,463.0
2018	1,324.2	575.2	13,750.5	14,345.8	-12,426.4	-13,770.6
2019	1,587.1	685.9	5,672.6	5,583.9	-4,085.5	-4,898.0

Source: Geostat data, Comext database

Data sources of Geostat were examined but were unable to identify the real cause. No huge amount of import of HS 27101929 is recorded in Georgia. In addition, Georgia does not transit these goods to any third country. Therefore, we assume that the reason for this asymmetry may be wrongful declaration in the customs records. It is also possible that country of destination for these commodities is not Georgia, but any other country.

After analyzing potential reasons causing asymmetries, special letter was prepared under the guidance of experts from Statistics Denmark. The aim of Twinning project, compilations made and main findings concerning reasons for asymmetries were described in the letter which was sent to Statistics Netherlands together with request for further support and cooperation which will determine better analyses of specific examinations and clarify main reasons causing asymmetries.

According to the response from representatives of Statistics Netherlands data was carefully checked and relevant exporting partners were also asked. Afterwards a clear cause was found: duplicate count in for HS good 27101929. This explains a part of the asymmetry from 2016 to 2018. Error was corrected and data from 2019 should not be affected by duplicate count.

6.5 Asymmetry studies with Germany

Germany was one of the countries selected for asymmetry studies concerning bilateral trade of Georgia with EU member countries.

Concerning the largest asymmetries at product level, bilateral trade with **HS code 7402 Unrefined copper; Copper Anodes for Electrolytic Refining** was extremely interesting for the investigation. In this case, Germany reports quite a large import of Unrefined copper; Copper Anodes for Electrolytic Refining from Georgia in 2016-2018, while Georgia does not record any export transaction to Germany related to this commodity.

Asymmetries with Germany are presented in the table below:

Table №28. Import of Unrefined copper; Copper Anodes for Electrolytic Refining (HS code 7402) by Germany in 2016-2018

Year	Reporter	Partner	Country of Consignment	1000 USD	1000 EUR	Tons
2016	Germany	Georgia	Georgia	4,861.3	4,391.8	1,035.3
2017	Germany	Georgia	Georgia	15,936.7	14,107.0	2,620.7
2017	Germany	Georgia	Korea, Republic of (South Korea)	0.0	0.0	-
2018	Germany	Georgia	Georgia	20,808.1	17,619.1	3,268.4

Note:

Year	EURO to USD exchange rate
2016	1.107
2017	1.130
2018	1.181

Source: Comext database

As identified, one of the potential explanations for the asymmetry could be **transit**. Import of Unrefined copper; Copper Anodes for Electrolytic Refining is wrongfully reported as imported from Georgia, while actually goods are exported from Armenia to Germany through Georgia. Mirror asymmetries between Germany and Armenia are presented in the table №29. According to the data from UN Comtrade database, Armenia reports export of 7402 to Germany by railway transport, while Germany reports import from Armenia by sea (Please, find tables №29 below).

Table №29. Asymmetries between Germany and Armenia
(concerning Unrefined copper; Copper Anodes for Electrolytic Refining - HS code 7402)

Import of HS code 7402 by Germany from Armenia (mode of transport - **Sea**)			**Export of HS code 7402 by Armenia to Germany** (mode of transport - **Railway**)		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	54 592.3	11 112.8	62 756.1	12 474.6	-8 163.8	-1 361.8
2017	61 860.6	10 141.5	70 711.2	11 777.5	-8 850.6	-1 636.0
2018	55 024.1	8 417.5	58 536.0	9 065.7	-3 511.9	-648.2

Source: UN Comtrade database

Although these mirror asymmetries are not big enough to explain the full asymmetry between Georgia and Germany, they still give some hint for analysis: The possibility, that at the first stage, goods are transported from Armenia to Georgia by railway, afterwards, they are exported to Germany by the Black Sea is quite high. Some of these goods might be recorded as import from Georgia, which causes the asymmetry.

After analyzing potential reasons causing asymmetries, special letter was prepared under the guidance of experts from Statistics Denmark. The aim of Twinning project, compilations made and main findings concerning reasons for asymmetries were described in the letter which was sent to Federal Statistical Office of Germany together with request for further support and cooperation which will determine better analyses of specific examinations and clarify main reasons causing asymmetries.

According to the response received from representatives of German statistics data was carefully checked and relevant local company was also asked. The main reason of asymmetry as occurred was wrong indication of country of origin by reporting enterprise. Georgia was reported as a country of origin instead of Armenia (from where copper was originated). However, since data was already disseminated no correction was made by German statistics. Nevertheless, the local company is now aware to report the correct country of origin in the future.

6.6 Asymmetry studies with Romania

Among other main partner EU countries one of the largest asymmetries are generated in the trade with Romania. There are quite large discrepancies between external trade data produced and disseminated by Geostat and the data Romania reported for the two main international trade statistics databases such as **UN Comtrade** and **Comext**.

Total asymmetries related to bilateral trade of Georgia with Romania in 2014-2019 are presented in the table №9.

Table №9. Asymmetries related to Georgian-Romanian bilateral trade in 2014-2019 (1000 USD)

	Export to Romania (Geostat data)	Import from Georgia (Comext data)	Asymmetry	Import from Romania (Geostat data)	Export to Georgia (Comext data)	Asymmetry
2014	4 293.9	4 618.3	-324.4	312 050.2	328 405.6	-16 355.4
2015	26 982.9	12 208.2	14 774.7	207 148.2	214 333.7	-7 185.5
2016	36 721.4	10 104.1	26 617.3	190 300.0	193 744.5	-3 444.5
2017	75 260.5	12 761.0	62 499.5	191 032.9	188 589.5	2 443.4
2018	57 840.0	8 809.9	49 030.0	209 212.3	210 059.5	- 847.2
2019	178 235.6	16 299.9	161 935.7	212 234.2	214 083.3	-1 849.1

Source: Geostat data, Comext database

As comparison on total level shows, asymmetry concerning to total export is consistent and it is negative only in 2014 and positive through 2015-2019 period i.e. export recorded by Georgia to Romania exceeds the value of import from Georgia reported by Romania. It should be noted that the relative asymmetry is much higher for export than for import.

As for import, asymmetry was negative in 2014-2016 and in 2018-2019 (i.e. import from Romania recorded by Georgia is less than export from Georgia reported by Romania) and was positive only in 2017 (i.e. import from Romania recorded by Georgia exceeds the export from Georgia reported by Romania).
Concerning the largest asymmetries at product level, bilateral trade with **Copper Ores and Concentrates** (HS code 260300) were revealed as extremely interesting for in-depth analysis as it's share in total asymmetry according to Georgian exports to EU countries is quite significant.

According to findings related to mirror comparison concerning Copper Ores and Concentrates, Georgia shows positive asymmetry with Romania i.e. Georgian exports are higher than Romanian imports. Georgia reports export of copper ores to Romania in 2018-2019 while Romania does not import copper ores from Georgia. Asymmetries with Romania concerning Copper Ores and Concentrates are presented in the table below:

Table №10. Asymmetry of Georgia with Romania in 2018-2019
(concerning Copper Ores and Concentrates - HS code 260300)

Export to Romania (GEOSTAT)			Import from Georgia (Comext, Comtrade)		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2018	50,682.5	37,528.8	-	-	50,682.5	37,528.8
2019	167,007.7	101,243.4	-	-	167,007.7	101,243.4

Source: Geostat data, Comext database, UN Comtrade database

At first potential explanation for the asymmetry identified during in-depth analysis was **transit**. (goods exported from Georgia are just in transit through Romania). However, part of copper undergoes

blending (i.e. some **processing** takes place) in Georgia. Geostat communicated with local exporter, according to the information obtained from the representative of the company, trade transactions mainly are made under an order from Swiss company. Unfortunately, local Georgian exporter had no information about exact countries of final destination, however, according the same local source, from Georgia goods are exported to Romania, but, the place where the copper ores are loaded, is close to the Serbian port and the probability that these goods will go directly to Serbia is high.

Moreover, according to the data from UN Comtrade database, Serbia records import of Coper Ores and Concentrates from Armenia and reports Romania as county of consignment, while Armenia does not report export (see table №11 below):

Table №11. Asymmetry of Serbia with Armenia in 2018-2019
(concerning Coper Ores and Concentrates - HS code 260300)

Import of 260300 of Serbia from Armenia (country of consignment - Romania)			**Export of 260300 of Armenia to Serbia**		Asymmetry	
Year	1000 USD	Tons	1000 USD	Tons	1000 USD	Tons
2016	45,279.8	39,574.3	0.0	0.0	45,279.8	39,574.3
2017	86,317.9	60,977.8	-	-	86,317.9	60,977.8
2018	121,129.1	74,078.8	-	-	121,129.1	74,078.8
2019	164,610.4	97,275.1	-	-	164,610.4	97,275.1

Source: UN Comtrade database

This further strengthens the hypothesis that copper (of Armenian origin) is exported from Georgia to Serbia with transit through Romania.

After analyzing potential reasons causing asymmetries, special letter was prepared under the guidance of experts from Statistics Denmark. The aim of Twinning project, compilations made and main findings concerning reasons for asymmetries were described in the letter which was sent to National Institute of Statistics of Romania together with request for further support and cooperation which will determine better analyses of specific examinations and clarify main reasons causing asymmetries.

Based on response from Romanian side, National Institute of Statistics of Romania has no access to transit declarations and therefore could not confirm transit through Romania. However, Romanian colleagues agreed that transit through Romania is as probable explanation for the asymmetry.

The relevant letter was sent to the Statistical Office of the Republic of Serbia as well. However, the response was not received.

Therefore, the main assumption is that Copper Ores and Concentrates exported from Caucasus countries (Georgia or Armenia) are in transit through Romania and country of their destination is either Serbia or other EU-member countries.

7. Conclusions

The main purpose of mirror analysis is to identify challenging issues and to improve the quality and comparability of data, at least to a certain extent. It helps the statisticians to acquire some information about the course of events often hidden behind the data. When discrepancies cannot be eliminated, the deeper understanding of the reasons greatly assists statisticians, when it comes to explaining to users why data, which should be the same, are different after all.

Nevertheless, comparing external trade data is most often not a simple task, given the numerous possible reasons behind as listed in methodological overview of current report (see 4.2 Possible reasons for asymmetries).

Asymmetries might be caused by methodological reasons, as well as by data errors. Some methodological reasons cannot be eliminated, just disclosed and explained. In contrast, correction of data errors is most desirable.

During mirror analysis regarding bilateral trade of Georgia with EU member countries no major methodological problems were identified which may explain asymmetries. However, some issues as potential reasons for asymmetry are still identified.

The most significant reasons for asymmetries identified during mirror analysis are listed below:

- ✓ **Different trade systems** – As was mentioned above, for compilation of External Merchandise Trade statistics Georgia uses the “General Trade” concept. Eurostat, EUs statistical office, apply the “Special Trade” concept in the Comext database containing IMTS data of the EU Member States. Furthermore, many Member States follows the practice of Eurostat and disseminate according to special trade concept in the national IMTS data. This difference in trade concepts can produce asymmetries.

- ✓ **Other possible reasons** (volatile currency, high exemption threshold for export, imputation of missing import of cars, misclassifications of commodities).

However, all possible reasons listed above have less influence on asymmetries compared to the major reason identified in the process of mirror analysis, that is **Transit Trade**. In-depth examination of major countries and commodities selected for investigation concerning asymmetry studies has shown that there are a lot of cases where the most likely explanation for the asymmetry is that Georgia is recorded as country of origin or country of final destination while in reality the operation is **transit trade** through Georgia. In many of these cases, the hypothesis can be supported by the fact that mirror asymmetries can be identified between the EU importer/exporter and countries like Azerbaijan, Armenia and Turkmenistan. Thus, transit appears to be the main possible reason behind asymmetries.

The geographical location of Georgia is an obvious potential reason behind the asymmetries related to transit trade. Situated at the juncture of Western Asia and Eastern Europe, bounded to the west by the Black Sea, Georgia is a natural transit country for goods travelling between Caucasus and beyond and EU. This could very well be a main factor behind the relatively large asymmetries between Georgia and the EU which can be detected in some years.

Reasons behind asymmetries can be multiple and for a user of the statistics, it will never be easy to identify these reasons. Consequently, users tend to be in doubt about which of the two data sets to trust the most. A analysis like the one carried out in this report can never give final answers to this question, but it should be noted that this project has identified many cases where the most likely explanation for the asymmetry is wrongful declaration of country of origin or country of final destination by the EU declarant when goods are transiting through Georgia. These cases are often related to goods like copper and petroleum oils and the transit hypothesis can be supported by mirror asymmetries, as mentioned above. Therefore, it may be suggested that users, when analyzing these goods and when they themselves are able to identify relevant mirror asymmetries, consider using Georgian data for their analysis.

This project has been able to analyse and suggest reasons behind some of the major asymmetries between the EU and Georgia. However, it has also become clear that asymmetries are not rooted in methodological faults or differences, which could be corrected with an aim to achieve a major reduction of asymmetries in one blow. Rather, it appears obvious that asymmetries mainly enter the data set because of a wealth of reporting mistakes made by individual reporters. Therefore, it is also clear, that despite the work done in this project asymmetries are likely to remain, at least in the short term. In the longer term, it does not seem impossible to reduce asymmetries, but it will require careful training of individual reporters concerning the importance of indicating the correct country of origin/country of final destination. This training should be carried out on a case by case-basis and will require an ongoing commitment from Geostat and EU partner countries.

Annex 1. Main concepts and definitions

FOB/CIF valuation - Exports are valued at **FOB** (Free on Board), i.e. franco-border prices of the exporting country (includes costs of cargo transportation to the board of exporting country and loading on-board of transport mean, excludes international freight and insurance costs), while imports are valued at **CIF** (Cost, Insurance and Freight) prices i.e. transportation costs to the border of the importing country (international freight and insurance costs are also included in addition to the price). Due to the FOB/CIF valuation the value of imports should generally higher than the value of the corresponding exports.

Triangular trade (with merchanting) – when a company in country A sells goods to a company in country B, which then cells them to a company in country C, although the goods are physically moved only once – from A to C. In such cases trade statistics should record an export from A to C and import from C to A. There is, however, a risk that country A or C will regard country B as its trading partner, but that B will not record the trade because there is no physical movement in that country.

Triangular trade (without merchanting) – if goods are exported from country A to country B and then later resold and redispatched to country C, in accordance with the allocation by country of origin country C will record an import from country A, country A an export to country B and country B an export to country C. In the end, asymmetries are created between A and C and also between B and C.

Time gaps - The same transaction can be recorded under a different reference period because of transport times.

Exchange rate differences - Due to the different timing of customs procedures in the exporting and importing countries, the value of the goods could be affected by any variation in the exchange rate.

Statistical confidentiality - Confidentiality can affect product or partner country classification. Asymmetries occur because confidentiality is not applied in the same way in every country. For instance, a country might record a transaction under a different commodity or country code than its partner country.

The general trade system is the wider concept and under it the statistical territory includes customs warehouses, all types of free zones, free circulation area and premises for inward processing.

The special trade system, on the other hand, is a narrower concept. Customs warehouses, all types of free zones and premises for inward processing are excluded from the statistical territory by the strict definition of the special trade system; thus only imports and exports of the free circulation area are recorded. The relaxed definition of special trade adds industrial free zones and premises of inward processing to the statistical territory. For instance, exports from country A to country B where goods are dispatched in a warehouse will be included in country B's statistics if B applies the general trade system but excluded if B applies the special trade system. If two countries apply different systems for trade, inconsistencies could appear.

Different treatment of specific transactions - some specific transactions might be treated in diffferent ways by the two partner countries, e.g. goods sent before or after repair, goods for temporary use, leasing, etc.

Exclusion of some goods - some goods might be excluded from trade statistics in one of the partner countries for confidentiality reasons (e.g. military equipment).

Some specific goods (electricity, maritime products, ships, aircraft, software, etc.) might not be followed properly by the customs administration, leading to different statistical treatment.

Fraudulent transactions could affect reporting at customs level, in particular on the import side, where duties are generally paid.

Errors into the collection system - errors can slip into the collection system of the customs authorities, made either by the declaring companies themselves or during processing of declarations.

Differences in the classification of goods, due to companies finding it difficult to classify their goods correctly. Errors or differing interpretations of detailed product classifications could cause mirror differences at detailed or even at aggregate level.