EU AGRICULTURAL DOMESTIC SUPPORT IN GLOBAL VALUE CHAINS OR WHERE DOES THE MONEY GO?

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Abstract

Domestic support to agriculture constitutes an important part of European Union (EU) policies. With trade and especially in the framework of global value chains (GVCs) the question arises as to what extend each part of the value chain benefits from a subsidy. We track subsidy flows by combining techniques of value added decomposition originating from GVC analysis with detailed agricultural domestic support data for the EU. This allows us not only to track subsidy flows inside the EU, but also those that are incorporated in exports to the rest of the world. EU domestic support is often blamed to hurt African farmers. To get an idea on the importance of this argument from the demand side, we analyse the contribution of European agricultural domestic support for final demand in African countries. Results show that EU subsidies are "traded" substantially within the EU, but an unneglectable share is also captured by non-EU countries.

Keywords

Agricultural Domestic Support, European Union, Global Value Chains, Africa.

1 Introduction

Domestic support to agriculture constitutes an important part of European Union (EU) policies with 41% of the EU budget being spent on farming (EU, 2019) and contributing on average about 12% to agricultural income (EU, 2018) in 2017. Farmers nowadays operate in a global network where inputs are sourced globally, production factors might not be owned, and agricultural goods are processed and consumed worldwide. With trade and especially in the framework of global value chains (GVCs) the question arises as to what extend each part of the value chain benefits from a subsidy: where does the money go and who is finally capturing these subsidies?

In addition, EU domestic support is often blamed to hurt African farmers by impacting on prices and quantities and making it difficult for non-supported African farmers to compete (e.g. Annan in EU OBSERVER, 2017). To get an idea on the importance of this argument from the demand side, a second research question evaluates how important a contribution of European agricultural domestic support constitutes for final demand in African countries.

A suitable method to answer these questions is the approach of trade in value added that allows to trace value added through multiple border crossings by abstracting from the good itself and looking into the value-added contribution of each value chain component. Thus, it is possible to analyse where the value added of goods exported or consumed was originally created.

GVC analysis developed and mainly focussed on manufacturing and services sectors. Literature on GVCs in agriculture is emerging but rare (see for example ANTIMIANI ET AL., 2018, GREENVILLE AND KAWASAKI, 2018). GVC literature addressing domestic support is to our knowledge not existent. Therefore, the objective of this study is to extend the methodology of trade in value added by a detailed depiction of domestic support provided to agricultural producers to answer the research questions raised above.

Focussing on European agricultural domestic support and applying value added decomposition techniques (JOHNSON AND NOGUERA, 2012) we trace the domestic support content of final demand inside the EU and its trading partners. This includes a detailed decomposition of the value-added measure to identify domestic support.

The study uses the METRO database (OECD, 2015) which is based on GTAP database v9 (AGUIAR ET AL. 2016) that is augmented with use-shares distinguishing intermediate and final demand goods and thus builds the base for value added decomposition. The METRO (and GTAP) database has the advantage that it depicts agricultural and food sectors in detail, which is key for the purpose of this study. Following the approach of URBAN ET AL. (2014, 2016) a domestic support database is constructed which is used to decompose subsidies in the METRO database.

This paper is organized as follows. Section 2 provides an overview about EU agricultural policies and its depiction in economic models, whereas section 3 introduces global value chain analysis. The database update and scenario design is detailed in section 3 followed by the presentation of results. The final section states general conclusions.

2 EU Domestic Support

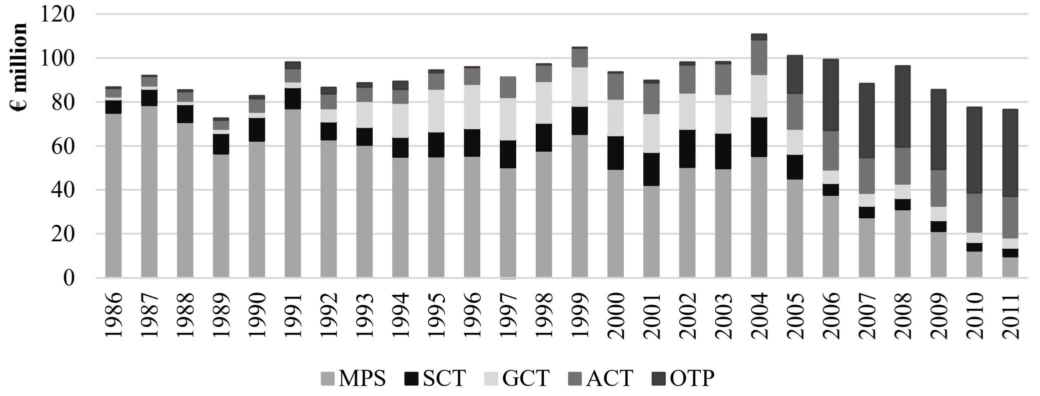
In this section, we provide first a brief overview about the development of the EU CAP and related policy reforms to reduce the trade-distorting effect of these payments. After that we briefly introduce how agricultural payments are currently represented in economic models to quantify their impact on international trade.

2.1 Overview EU Common Agricultural Policy

The World Trade Organization (WTO) criticizes domestic support because of its trade-distorting effects. Many countries such as the EU undertake their agricultural policies regularly reforms to satisfy WTO reduction commitments. However, PANAGRIYA (2005) and MATTHEWS (2008, 2010) still emphasize the impact on agricultural producers, particularly in developing countries.

Figure 1 shows the development of the EU Common Agricultrual Policy (CAP) over the period 1986 to 2012. It clearly highlights the change in the composition of domestic support payments and thus well depicts the CAP reforms. Initially, the CAP policy was dominated by trade distorting instruments such as intervention prices (market price support, MPS) and output subsidies that increased agricultural production in the EU and replaced imports. In addition, oversupplies have been dumped on the world market.

Figure 1: Development of EU CAP Support from 1986 to 2011



Source: Author's elaboration based on OECD PSE database (OECD, 2014)

The MacSharry reform in 1992 created a landmark in the EU policy reforms by replacing a share of the intervention prices with direct payments that are less trade-distorting, however still coupled to production. Figure 1 highlights the reduction of MPS over time and the increase in product-specific (single commodity transfer – SCT) and group-specific (group commodity transfer – GCT) domestic support. With the Agenda 2000 the EU made the first step towards decoupling domestic support by shifting payments from the first pillar to the second to support rural development and environmental targets – increase of payments provided to all agricultural commodities (all commodity transfer, ACT) in figure 1. The biggest achievement has been made with the introduction of the so-called single farm payments (SFP) in 2003. Agricultural producers receive these payments based on entitlements and eligible land combined with the observation of cross-compliance conditions - rules related to the protection of the environment, animal welfare, public and animal health - and since 2014 also the greening element of the CAP - the adoption of farming practices that help meeting environment and climate objectives. Production is not required to receive these payments. Therefore, these payments are supposed to not create any production incentives. The increase in other transfers to producers (OTP) in figure 1 shows these recent developments.

2.2 Domestic support in a global economic model

CGE and PE models are both tools often used to analyse the impact of agricultural policy reforms on the domestic and world market, factor usage, farm income and welfare. The advantage of PE models is the detailed depiction of different policy instruments, agricultural commodities and different farm types, however, they do not capture repercussions from the world market. While CGE models lack detail, they best consider interlinkages with the world market, up- and downstream sectors, as well as factor markets. In standard CGE model frameworks such as e.g., the GTAP model and database, domestic support payments are included in form of five price wedges that affect the transactions of producers at producers and market prices for output, intermediate inputs, land, labour and capital. This standard approach does not consider details with regard to different production requirements of these payments and therefore do not capture the related influence on farm level output decisions created by these payments. This is particularly important for decoupled payments.

A literature review reveals that decoupled payments in economic simulation models are currently based on "ad-hoc" assumptions. The main reason is the lack of theoretical based estimation results. Many approaches consider decoupled payments as being production neutral and model them as a payment allocated homogenously to the land factor (e.g., BOULANGER AND PHILIPPIDIS, 2015; FRANDSEN ET AL., 2003; NOWICKI ET AL., 2009; URBAN ET AL., 2014, 2016). By contrast, the standard GTAP database distributes these payments at a homogenous rate across all factors of production. Single country CGE models include these payments as income transfers to households (e.g., BOYSEN ET AL., 2016; GELAN AND SCHWARZ, 2008). BOYSEN ET AL. (2016) deviate from ad-hoc assumptions by calibrating the degree of decoupling based on agricultural output in the model and database. The assumptions with regard to the degree of decoupling are a decisive factor driving models' results (BALKHAUSEN ET AL., 2008; GOHIN, 2006; URBAN ET AL., 2014). To contribute to overcoming the problem of ad-hoc assumptions BOULANGER ET AL. (2017) utilizes the most recent available estimates for the capitalization rate of decoupled payments (see CIAIAN & KANCS, 2012; MICHALEK, CIAIAN, & KANCS, 2014) into the land price and distributed the remaining share of decoupled payments according to the factor usage.

Applying the GTAP (URBAN ET AL., 2016) and MAGNET model (BOULANGER ET AL., 2018) both extended to include a detailed representation of the EU CAP, the studies simulated the elimination of agricultural support in the EU and evaluated the effects on international trade and Sub-Saharan Africa, respectively. While BOULANGER ET AL. (2018) state increasing prices for agricultural commodities that are harmful for consumers in net-food importing countries, URBAN ET AL. (2016) state changes in import and export flows and thus clear trade distorting effects of CAP support. Such trade distorting effects are confirmed by SALVATICI (2001) and BOYSEN-URBAN ET AL. (forthcoming) by measuring the Trade Restrictiveness Index and the Mercantilist Trade Restrictiveness Index of the CAP, respectively. In addition, the study of BOYSEN-URBAN ET AL. (forthcoming) also indicates the pass-through of support provided to agricultural producers to forward-linked sectors. MATTHEWS ET AL. (2017) provide a well-researched overview about different EU agricultural support instruments and their impact on international trade.

3 Tracing Subsidies through the Value Chain

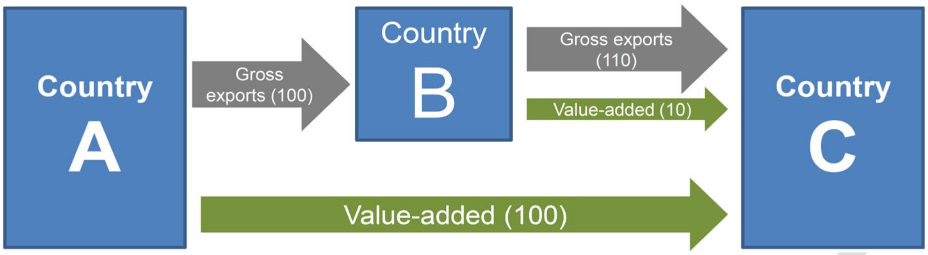
3.1 Tracing Value Added

We use techniques of value added decomposition to trace subsidies from the producer to the consumer. This value added decomposition originates from so-called Global Value Chain analysis that aims to describe and analyse international production fragmentation. In particular, GVCs describe a situation where in addition to the (traditional) regional separation of production and consumption different stages of production happen in different countries (for a recent literature overview see DE BACKER ET AL., 2018). This phenomenon of international production fragmentation is rapidly evolving in recent years and made possible by communication technologies that allowed to coordinate complex processes at a distance (BALDWIN, 2012). Particularly important for fragmentation in the agro-food sector are the availability of information about the production process, contracting and marketing arrangements that are key to build trust among the value chain participants (GREENVILLE ET AL., 2019).

Figure 1 illustrates the concept of value added decomposition. Assume a situation with 3 countries, country A is producing a good used in the production of the export good of country

B. Country C is importing goods worth 110 from country B, which itself imports goods of value 100 from country A. In traditional trade data country C is importing 110 from B and doesn't have a trade relationship with A. When decomposing trade flows by value added contribution, C is importing 100 from A and only 10 from B, total imports are still 110.

Figure 2: Unpacking Trade Flows



Source: OECD (2013)

When goods cross borders multiple times, gross trade data does not reflect the true picture anymore. Issues include the value of reimport of own VA, when a good was sent abroad for further processing, and double counting, in the example above for example total gross trade amounts to 210 while the value added created by trade is 110. Further, trade balances might be misleading, for example in 2004 the US deficit with China is 30-40% lower when measured in value added terms compared to gross terms, while the deficit of the US with Japan increases about 33% (JOHNSON AND NOGUERA, 2012).

Most importantly policy instruments and data needs to be analysed differently when firms widely use imported intermediate inputs. In this case, as demonstrated for example by KOOPMAN ET AL. (2010), a tariff is hurting domestic competitiveness instead of protecting domestic industries. In addition, tariffs and non-tariff measures are accumulating when goods cross borders multiple times (ROUZET AND MIROUDOT, 2013; GHODSI AND STEHRER, 2016; DIAKANTONINI ET AL., 2017; MURADOV, 2017). Besides, there is a wide literature around the influence of trade policy and GVC participation, important also in a regional dimension (overview in DE BACKER ET AL., 2018).

The effect of GVCs is not limited to border measures but extend also to domestic policies. If domestic production is relying on imported intermediates and large parts of domestic production is exported, further transformed abroad and consumed somewhere else, then also consumers in other parts of the world are affected by 'domestic' policies. KOWALSKI ET AL. (2015) also include FDI policies, IPR protection, and infrastructure and logistics policies in their analysis on GVC participation. To our knowledge our paper is the first attempt to analyse agricultural subsidies in a GVC framework.

3.2 Database and Value Added Decomposition

The Inter-Country-Input-Output Table (ICIO)

This paper aims to trace subsidies through the value chain. For this purpose, we combine GVC techniques with domestic support data (section 2). A so-called Inter-Country-Input-Output Table (ICIO) serves as basis for analysis, a distinguishing feature of the ICIO constructed for this analysis is a detailed differentiation of value added by different items with focus on domestic support data.

The well-known Input-Output Tables describe the sale and purchase relationships between producers and consumers within an economy, detailing inputs and production factor needed to produce a good, taxes paid and how the good is used: domestically as input, for final demand, or exported. A global Input-Output Table database constitutes of single regional Input-Output Tables connected by trade flows. The ICIO table adds an additional layer of bilateral relationships to this framework by detailing the origin of goods. Thus, the ICIO forms one big table identifying in the column the country of origin of inputs and final demand goods, and in the row depicting how a good is used domestically and how it is used if exported. This means that the ICIO specifies, i.e., the country and sector where a good is used as input, or the country and agent where it is finally consumed.

The study uses the METRO database (OECD, 2015), a database in Input Output Table format based on the GTAP database v9 (AGUIAR ET AL., 2016) that is augmented with data on use categories distinguishing trade in intermediate and final demand goods compiled at the OECD. The METRO (and GTAP) database has the advantage that it depicts agricultural and food sectors in detail which is key for the purpose of this study, and not available in other ICIO initiatives such as WIOD (DIETZENBACHER ET AL., 2013), the OECD-ICIO (AHMAD ET AL., 2017), or EORA (UNCTAD-EORA GVC DATABASE, 2014). In addition, the country coverage allows a detailed depiction of Africa.

The intermediate input matrix is at the core of the analysis, and thus the data on use categories defining the amount of goods imported for intermediate consumption or final demand. The METRO database differentiates 4 use categories – intermediates, private consumption, government consumption and investment goods – and bilateral trade data (originating from GTAP) are distinguished additionally by these use categories. Thus, the METRO database details for example, how much of the meat imports from the United States to Germany is further processed in Germany (intermediates) or directly consumed. Use category are identified using the UNSD Classification by Broad Economic Categories (BEC) which classifies goods to end uses based on their characteristics on detailed HS6 level[1]. Use shares for agricultural, mining and manufacturing sectors are obtained combining Comtrade data[2] with the BEC classification[3]; for services sectors data is drawn from the OECD ICIO system (AHMAD ET AL., 2017)[4].

While the use of ICIOs has become a common approach in GVC analysis there are some limitations due to data availability. In particular, the precise identification of the links between exports of one country and the purchasing industries or final demand consumers in the importing country constitutes an issue (AHMAD ET AL., 2017). Hence, the allocation of trade flows by country and sector of origin and destination is based on assumptions, and in ICIO construction imports are typically distributed over industries assuming proportionality, for example, the OECD-ICIO, WIOD. We follow the major ICIO projects assuming proportionality, hence sectors, while varying in the amount of imports used[5], use these in the same bilateral proportions.

VA decomposition

The VA decomposition in this paper follows the approach of JOHNSON AND NOGUERA (2012) that has been adapted for the METRO model in FLAIG ET AL. (forthcoming). The decomposition basically derives from the following relationships: Output (Y) is composed of intermediate (AX) and final demand (C), $Y=AY+C$, where A is a matrix of technological coefficients. This

[1]For further information on the BEC classification see the homepage of the UNSD: https://unstats.un.org/unsd/publications/catalogue?selectID=331

[2]Further information is available on the UN homepage for comtrade: https://comtrade.un.org/

[3]While widely used this approach also has some important caveats: first, in some cases goods become intermediates in use not in characteristics – for example tyres are final goods when bought as replacement tyres, but are intermediate goods when installed in car. Second, and deriving from the first point, there are ‘miscellaneous’ categories that cannot be attributed to intermediates or final demand categories and these can be important for some sectors (such as motor vehicles). To limit distortions those categories are distributed across end-uses assuming proportionality.

[4]This allows the classification of services, however, the country coverage of the OECD-ICIO is limited, i.e., does not cover African countries. Given the focus on agriculture and food sectors of this paper we believe this has a limited effect on our analysis.

[5]Aggregate (sum over source regions) import shares are sourced from GTAP and vary by activity for countries where this information is available.

can be rearranged to $IY\text{-}AY=C$, $(I\text{-}A)Y=C$, and $Y=(I\text{-}A)^{-1}C$, where I is an identity matrix and $(I\text{-}A)^{-1}$ represents the so-called *Leontief-Inverse*.

In a global input-output framework row and column sums are equal implicating that output equals total demand: $Y = AY + C = AY + VY$, where V is a diagonal matrix of value added coefficients. The resulting relationship $VY=C$ can be introduced in the output presentation from above, (I-A)Y =VY, and finally

$$i = Vi[I\text{-}A]^{-1} \tag{1}$$

where i is denoting any sector country unit vector. Then the square matrix $\mathrm{V}[\mathrm{I} - \mathrm{A}]^{-1}$ depicts the source of value added for each unit of production in the column sector. With this relationship final demand can be decomposed by VA source:

$$C = V[I\text{-}A]^{-1}C \tag{2}$$

The multiplication of multi-dimensional matrices in this exercise allow to distinguish different routes through which a source country's VA arrives at destination country. The resulting matrix (C_VA) depicts VA source region (ws) and source sector (c), in final demand by commodity group (cagg) in region (r) and the region where the final demand good was sourced from (w):

$$C\_VA_{ws,c,r,w,cagg} = v_{ws,c} * \left[I_{ws,c,w,a} - a_{ws,c,w,a}\right]^{-1} * c_{w,a,r,w,cagg} \tag{3}$$

In this framework VA is by definition output minus intermediates and thus includes factor costs (such as labour, land, capital), margins and net taxes. This allows us to further decompose net taxes as described below.

4 Scenario Setup and Results

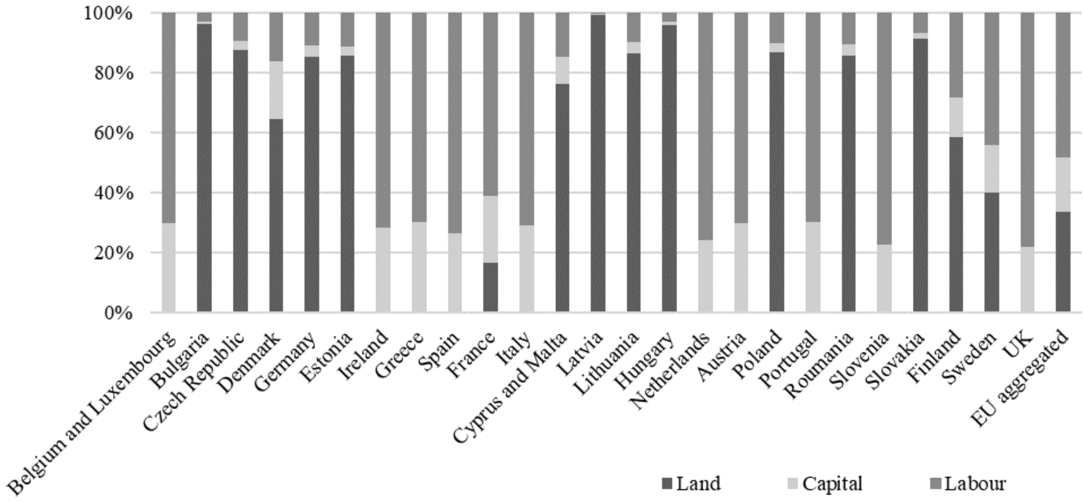
4.1 Scenario Setup

To include a detailed representation of agricultural domestic support, we follow the approach of URBAN ET AL. (2014, 2016). This approach applies the OECD Producer Support Estimate (PSE) classification (OECD, 2010) of domestic support payments which groups payments according to their production requirements into 4 different payment categories – single commodity transfer (SCT), group commodity transfer (GCT), all commodity transfer (ACT) and other transfer to producers (OTP) that includes the decoupled payments and thus account for the impact of these payments on farmers' decisions.

Applying a modified version of the Altertax program (MALCOLM, 1998), we incorporate PSE budgetary transfers based on data compiled by BOULANGER ET AL. (2016) according to its sub-category payments of SCT, GCT, ACT, and OTP and payment types, i.e., output, input use, land, labour and capital. This approach splits price wedges according to all four PSE categories and enables us to achieve a thorough representation of domestic support in the price linkage equations and the underlying value flows. The SCT payments are linked to specific products, whereas ACT and GCT payments are given to groups of commodities and are therefore allocated at a homogenous rate across the commodities belonging to these product groups. Inspired by BOULANGER ET AL. (2017), we utilize the most recent available estimates of capitalization rates of decoupled support for the CAP period 2007 to 2013 (CIAIAN ET AL., 2018) to allocate a share of the OTP payments at a homogenous rate across agricultural sectors to the factor land and distribute the remaining share homogenously across all production factors.

This scenario depicts the most realistic set-up by considering different degrees of decoupling based on EU country specific estimates of the capitalization rate into the land price of the CAP instruments of the period 2008 to 2014. The distribution of payments across production factors is shown in Figure 3. The result is an updated GTAP database with the most realistic allocation of domestic support payments that is then used to decompose net taxes in the METRO ICIO.

Figure 3: Allocation of Factors



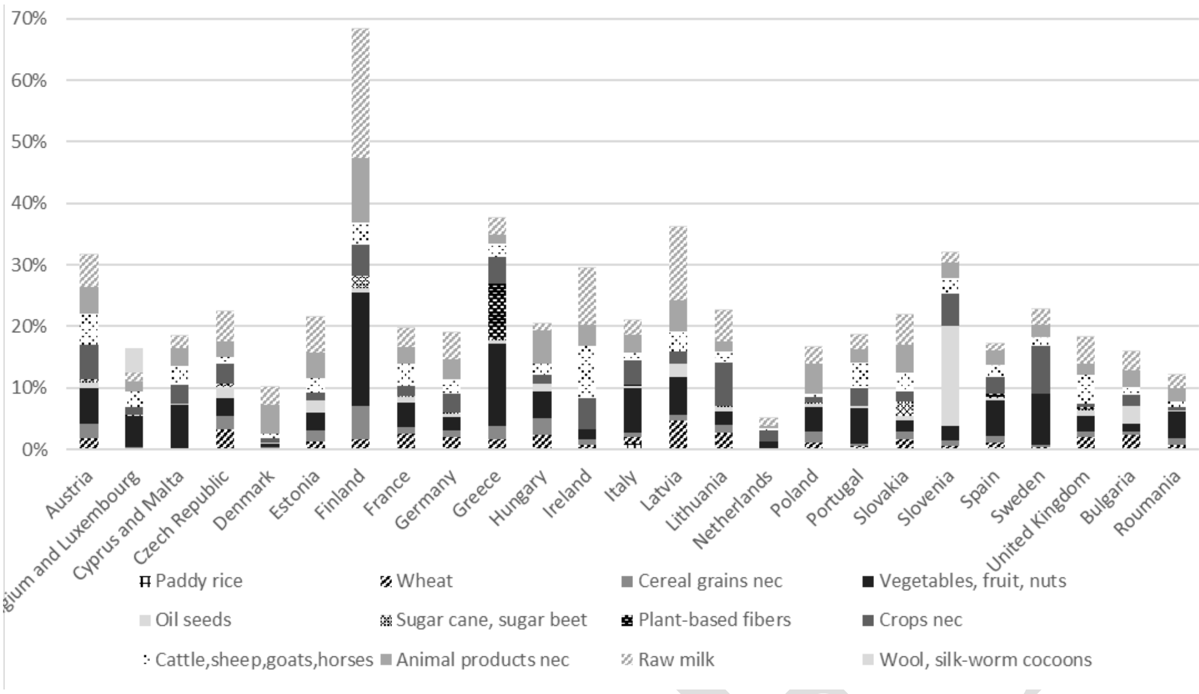
Source: Model Results

The analysis uses two regional aggregations (i) the first, focussing on the EU and distinguishing nearly all EU countries as well as its main trading partners; (ii) the second focusses on Africa distinguishing 26 African countries, the EU and world regions. Further we distinguish 14 agricultural (including forestry and fishing) and 8 food sectors; manufacturing and services are grouped in 9 categories. Accordingly, the evaluation of results consists of 2 parts. The first part (section 4.2) shows the impact of EU subsidies with a focus on intra-EU trade and other EU trading partner, while the second part (section 4.3) analyses the impact of EU subsidies on SSA.

4.2 The EU Hub

The support landscape in the EU differs strongly by country (Figure 4). The share of subsidies relative to agricultural output ranges from 5% in the Netherlands to 68% in Finland, while the majority of countries fluctuate around 20%. These differences arise from the specific agricultural structure in each country which becomes evident when regarding the distribution of domestic support among sectors: 40-60% go to animal production such as breeding, fattening and milk, where milk alone receives 10-30%. However, there are exemptions such as Denmark (80%) and Ireland (72%) where animal production constitutes a major part of agricultural production and subsequently domestic support is concentrated in these sectors. In other countries animal production plays a minor role such as Greece (15%) and Slovenia (20%). Another large part of subsidies, 20-30%, goes into vegetables, fruits and nuts in most countries.

Figure 4: Subsidies Relative to Output Value by Receiving Sector and Country

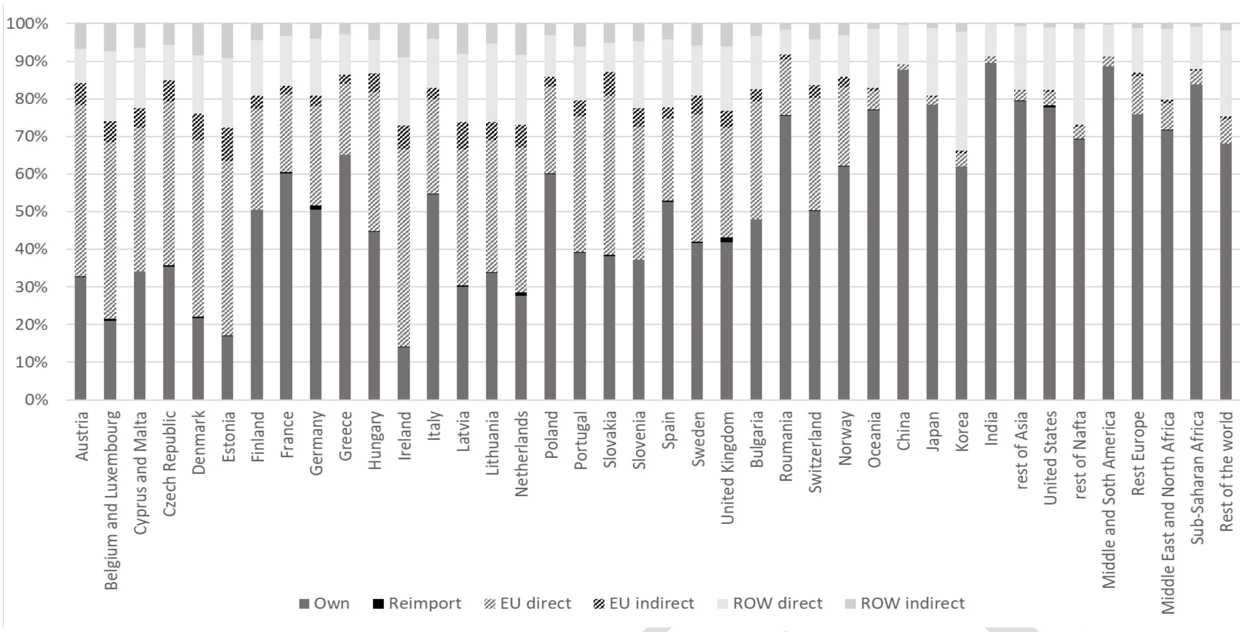


Source: Model Results

EU countries are strongly engaged in agro-food trade. Figure 5 depicts the composition of final demand (household, government, investment) in agro-food products by origin where the value added had been created. Overall a relatively small share of final agro-food consumption is not traded (not crossing at least 1 border – "Own"). Again, there are strong differences between countries ranging from Romania, where 75% of agro-food consumption originates from within the country, to Ireland where only about 15% of agro-food consumption are domestic. Most of the trade happens inside the EU, about 20% are sourced from outside the EU, which matches about the amount that is imported in other regions of the world. Reimports of own value added, goods that are sent abroad for further processing, play only a minor role in the EU.

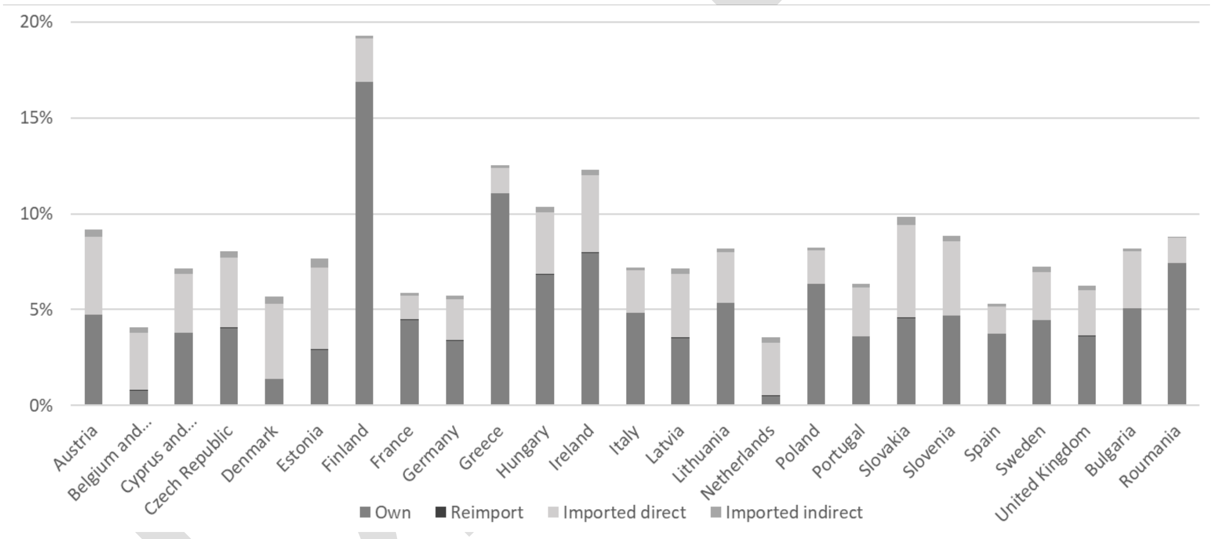
Figure 5 also details direct and indirect flows, direct indicating that the final product crosses one border before being consumed in the destination country, indirect, that production process involves a third country and the product thus crosses a border at least twice. Indirect flows account about 5% in intra-EU trade and up to 10% for ROW imports.

Figure 5: Composition of Final Demand in Agro-Food Products



Source: Model Results

Figure 6: Share of Domestic Support in Final Agro-Food Demand



Source: Model Results

Figure 6 depicts the share of domestic support in agro-food demand. Thus, subsidies account for 9% of Austrian total agro-food consumption and half of these subsidies are imported from other EU members. Again Finland constitutes an outlier with subsidies accounting to 19% of final demand, followed by Greece (13%) and Ireland (12%). The majority of countries ranges between 5 and 10%. The BENELUX countries have the lowest values with about 4%.

The importance of imported subsidies differs between the countries and is not necessarily related to the import share of agro-food products. For example, the Netherlands, Lithuania and Latvia show a similar trade structure in Figure 5, with 53-60% of EU originating consumption being imported, while 85% of subsidies consumed in the Netherlands are imported, 50% in Latvia and 35% in Lithuania. Imported subsidies are most important in the Netherlands, Belgium and Luxemburg, and Denmark. Finally, subsidies tend to be higher on domestic sourced VA compared to imported VA.

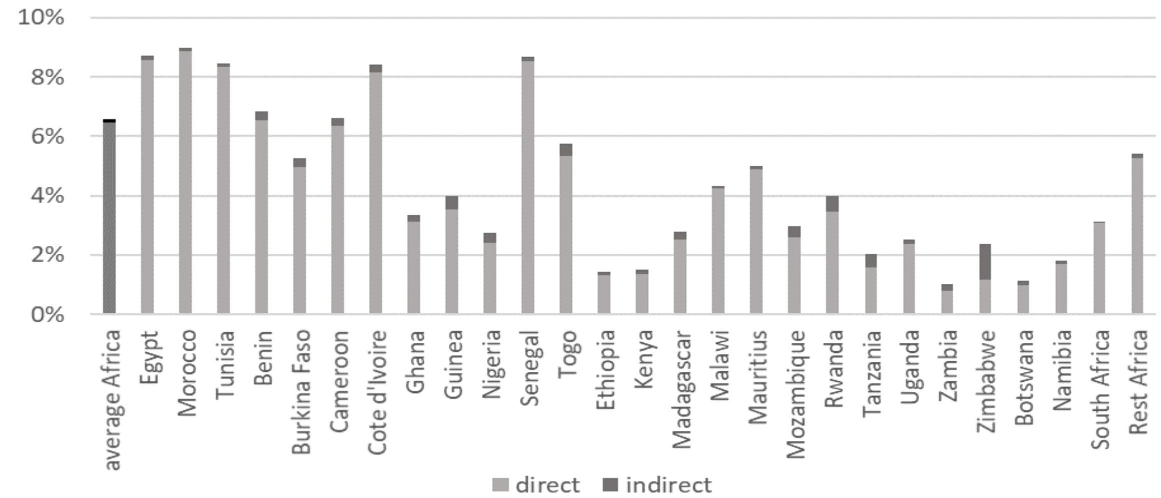
Comparing the level of subsidies paid with the level consumed reveals that the big “protectors” also consume the highest level of subsidies, this holds also for the lower end of the scale.

However, in the middle this relationship does not hold, due to trade and different preferences with regard to processing. For example, Latvia holds position 3 in level of subsidies paid, but is only positioned 17 with regard to the level consumed; Hungary moves from position 13 (subsidy paid) to 4 (subsidy consumed).

4.3 EU Subsidies in Africa

The EU agro-food sector is strongly engaged in trade also with countries outside the EU, what opens the question as to where EU domestic support payments are going internationally. An analysis of subsidy values in final consumption reveals that a large part, 83%, is consumed inside the EU. This also implies that a non-negligible part of 17% is consumed in other countries; 2% of EU domestic support payments are finally consumed in Africa. Of these Egypt and Morocco receive 40% (22% and 18% respectively), followed by Nigeria (8%), South Africa (8%), Tunisia (6%); Cote d'Ivoire, Senegal, Cameroon, Ghana, Benin and Mauritius hold together another 12% (3-1% each).

Figure 7: Subsidies in Agro-Food Final Demand Relative to VA Imports from the EU



Source: Model Results

EU domestic support accounts on average for about 7% of VA imports from the EU that are consumed in Africa (Figure 7). That is, subsidies reduce the value consumed by 7%. There are strong differences in the rate of subsidies between single countries that are related to the basket of goods that are imported. A comparison of Table 1 and Figure 8 give an indication where these differences originate from. First, sectors differ by intensity of support, second, the countries differ in their import basket. Table 1 shows subsidies relative to output, first, by agro-food sector because this is the relevant measure for goods traded, and second, by agricultural sector. It might be surprising to see animal products in the lower part for subsidisation, however, the traded goods are typically meat and dairy that include further processing. This processing lowers the importance of the subsidy in the total value. Figure 8 depicts the composition of agro-food imports from the EU by country. Other food and beverages cannot be directly linked to a specific agricultural sector, but tend to be highly processed, and therefore the subsidy share is expected to be below average[6].

Taking for example, Nigeria and Senegal, in Nigeria 65% and in Senegal only 45% of imports have below average subsidy levels (other food and beverages, and forestry and fish), moreover, 40% of Senegal imports and less than 20% of Nigerian imports are in high subsidy containing goods.

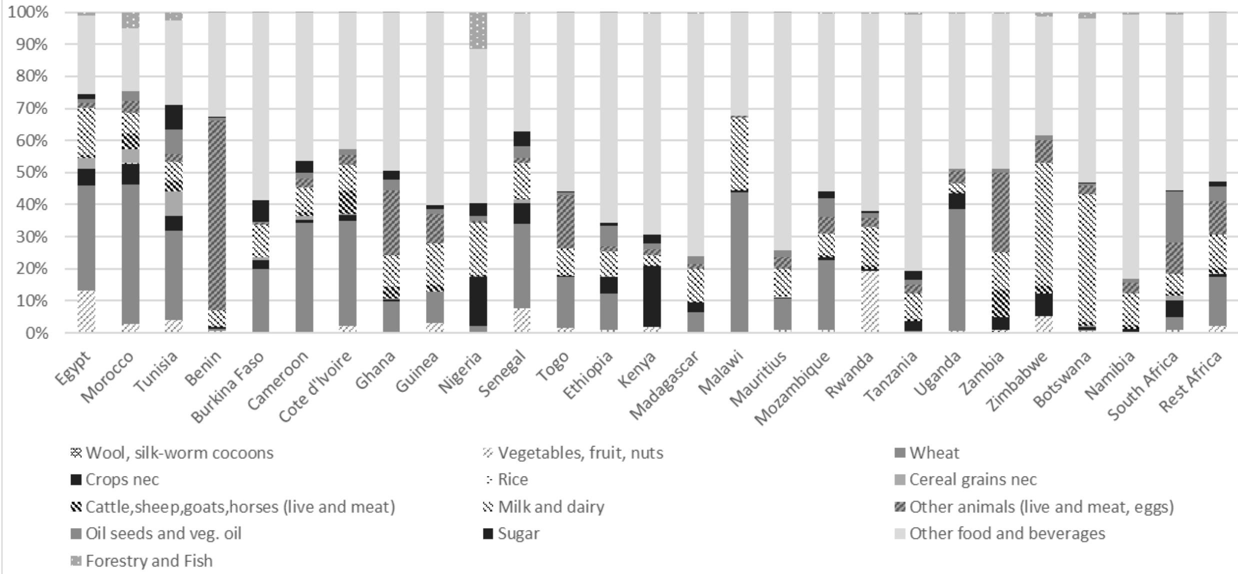
[6] Our analysis does not include fish and forestry due sparse data on the subsidy side and quality issues of the trade data, there is however scope for future research in this area.

Table 1: Domestic Support Relative to Output

	Subsidy relative to output of agro-food sector	*Subsidies relative to agricultural output*
Vegetables, fruit, nuts	25%	25%
Wheat	18%	18%
Crops nec	18%	18%
Rice	18%	(paddy rice) 73%
Cereal grains nec	13%	13%
Cattle,sheep,goats,horses (live and meat)	8%	(live animals) 22%
Milk and dairy	5%	(milk) 21%
Other animals (live, meat, eggs)	5%	(live and eggs) 14%
Oil seeds and veg. oil	4%	(oil seeds) 15%
Sugar	3%	(sugar cane,-beet) 15%
AVERAGE (including other food, forestry and fish)	**5%**	**19%**

Source: Model Results

Figure 8: Composition of Agro-Food Imports from the EU



Source: Model Results

Most subsidies are consumed in form of agro-food goods. A non-negligible part is also consumed in form of services goods (i.e., restaurants) and manufacturing. Services account for 13% and manufacturing for 9% of EU domestic support consumed in Africa. However, subsidies are less relevant in the other sectors for agro-food products subsidies amount to 6.6% VA imports from the EU, for manufacturing to 0.9% and services to 0.2%.

5 Conclusions

The impact of domestic support payments provided to agricultural producers on agricultural output or its contribution to farm income is often analysed using economic models, because domestic support is heavily criticized for its trade distorting effects. However, questions such as who finally benefits from capturing these subsidies remain unanswered. Does the farmer capture the total value of the subsidy or is the subsidy at least partially passed through along the (global) value chain?

To contribute to answering these questions we extend value added decomposition techniques to account for domestic support flows, taking the EU agricultural policy as an example. To account for different production requirement, we update the representation of domestic support in the underlying database.

The EU still provides high level of support to agricultural producers, however, the level of support provided to the member states differ with the highest share of support compared to value of production in Finland and the lowest in the Netherlands. Agricultural and food commodities are strongly traded, of which a large part is intra-EU trade, although here the importance of trade in the agricultural sector also varies between member states. Looking at the share of subsidies in final consumption, the results of the analysis reveal that part of the subsidies provided to producers in a country are passed on to the consumers in the country. In addition, subsides are also transferred to final consumers in other countries via trade. The share of domestic to imported subsidies in the EU member states depends on the share of subsidies related to production (e.g., Finland has also the highest share of domestic support in final consumption) but also on the importance of international trade, and intra-EU trade and in particular on the extent to which the imported products are subsidized in the origin country. The Netherland, for instance, provide a relatively low amount of subsidies compared to the output value, therefore, they import a relatively higher share of subsidies from other EU member states compared to the share of domestic subsidies in final consumption.

17% of EU agricultural support is consumed in non-EU countries of which 2% is passed on to Africa. This is particularly interesting, since EU domestic support is often criticized for unfair competition with regard to Africa. EU domestic support consumed in Africa accounts for a subsidy share related value added import of 7% implying a reduction of the consumption value. These effects differ between countries and clearly depend on the size of trade with the EU, but particularly on the traded commodity basket, i.e. the share and type of support provided in the specific commodities.

This study provides a springboard for future research. In the results section the focus is on aggregated value flows for the agricultural sector, however, digging deeper into the specifies of different agricultural commodities and the related support instruments might provide further insights into the effects stated in the results section. Furthermore, the literature reveals that decoupled payments still affect agricultural production via other coupling channels such as the impact on farmers' risk behaviour, farm exit or off-farm versus on-farm labour decisions, and access to credits as well as expectations about future payments. This study utilizes recent estimates of the capitalization rate of decoupled payments into the land price. However, as of yet, there is no consensus in the literature, therefore, it might be worthwhile to conduct a sensitivity analysis to analyse the impact of the underlying assumptions with regard to the degree of decoupling of these payments on the GVC analysis results.

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