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Cumulative economic impact of trade agreements on EU agriculture

2021 UPDATE

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Interactive infographic

The reader is invited to consult the EC data portal of agro-economic modelling DataM at https://datam.jrc.ec.europa.eu for more details of the modelling results. The interactive infographic about this study is under the "Agro-economic studies" section.

Direct link: https://datam.jrc.ec.europa.eu/datam/mashup/FTA_2021

Contents

Abstract

This report investigates the potential effects of 12 free trade agreements (FTAs) under the current EU trade agenda. For this, it quantifies the cumulated sectoral impacts in terms of bilateral trade, production, demand, and price developments. Moreover, it provides insights on the evolution of supply, demand, and farm-gate prices for the most relevant EU agricultural commodity markets. In contrast to a forecast exercise, this analysis compares two variants of a trade liberalisation scenario (conservative and ambitious) to a business-as-usual (baseline) situation in 2030. The study confirms that the analysed free trade agreements have the potential to benefit the EU agri-food sector when considered simultaneously. It also highlights the vulnerability of the beef, sheep meat, poultry, sugar, and rice sectors.

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Executive summary

This report builds on a previous study published by the European Commission's Joint Research Centre (JRC) in 2016 and analyses the cumulative economic impacts on the EU's agricultural sector of a series of concluded and negotiated free trade agreements (FTAs) between the EU and 12 trading partners.

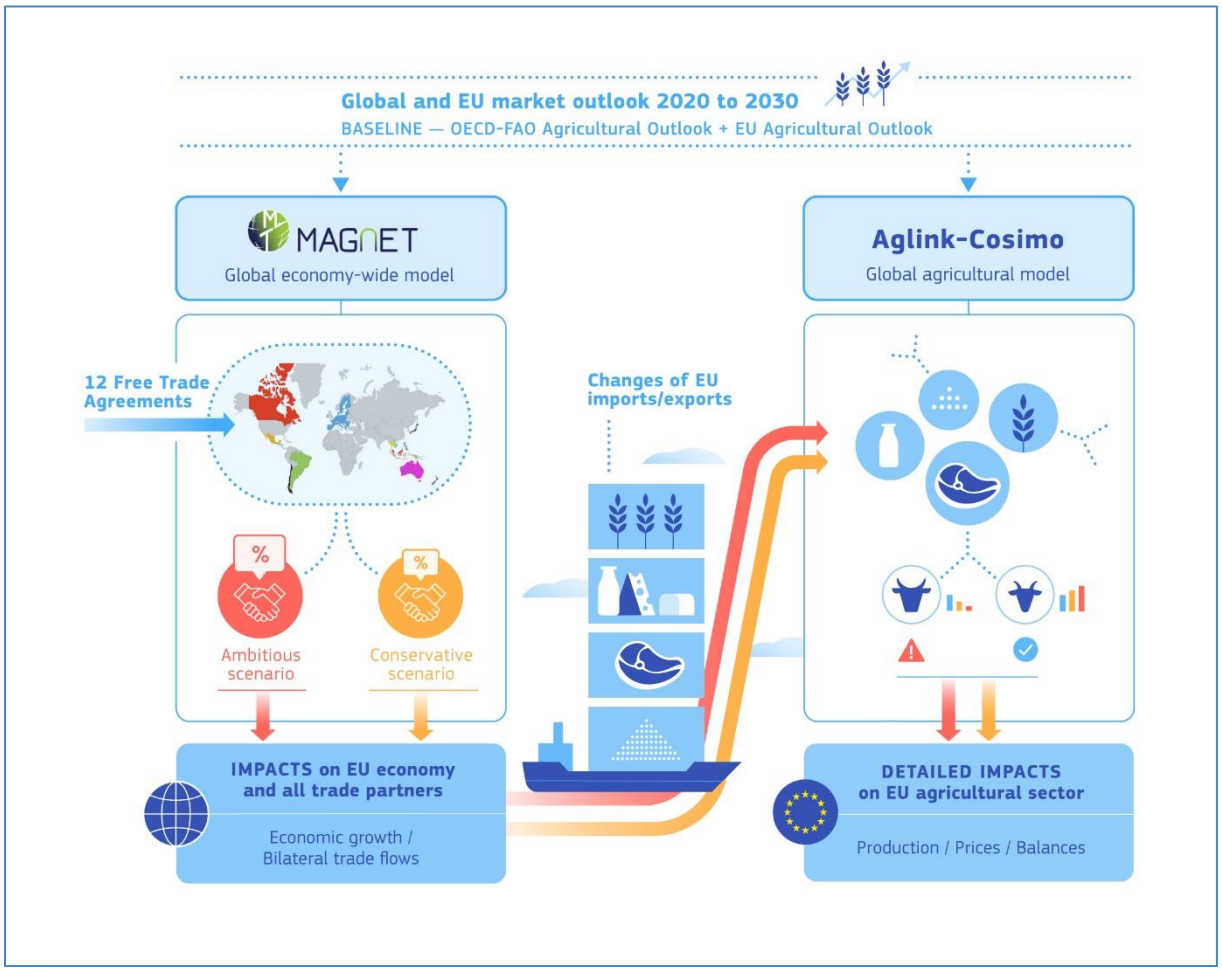
The 12 agreements with Australia, Canada, Chile, Indonesia, Japan, Malaysia, Mercosur (Argentina, Brazil, Paraguay, and Uruguay), Mexico, Malaysia, New Zealand, the Philippines, Thailand, and Vietnam represent a significant part - although not exhaustive - of the initiatives under the current EU trade agenda. They cover agreements where the EU has strong agricultural export interests and agreements with trading partners that have the capacity to significantly increase their agricultural exports to the EU.

By 2030, those 12 countries are expected to be the destination of 13% of the EU agri-food exports and the origin of 34% of the EU agri-food imports (before the implementation of the bilateral trade agreements).

The list of agreements considered has been updated since the 2016 study, to account for the revised EU trade agenda. This, together with the change of time horizon (2030 compared to 2025), the departure of the United Kingdom from the EU in 2020 (this study covers the EU27) and several model improvements, calls for caution when comparing the results with those of the 2016 study.

The economic assessment is based on a two-tier modelling approach:

1. an analysis of the impacts of the 12 FTAs on the EU agri-food trade flows, performed by means of simulations with the Modular Applied GeNeral Equilibrium Tool (MAGNET) model, a global computable general equilibrium (CGE) model;
2. a detailed analysis of the impacts on EU agriculture at product-specific level, run by means of the partial equilibrium (PE) model Aglink-Cosimo.



Source: Authors' elaboration

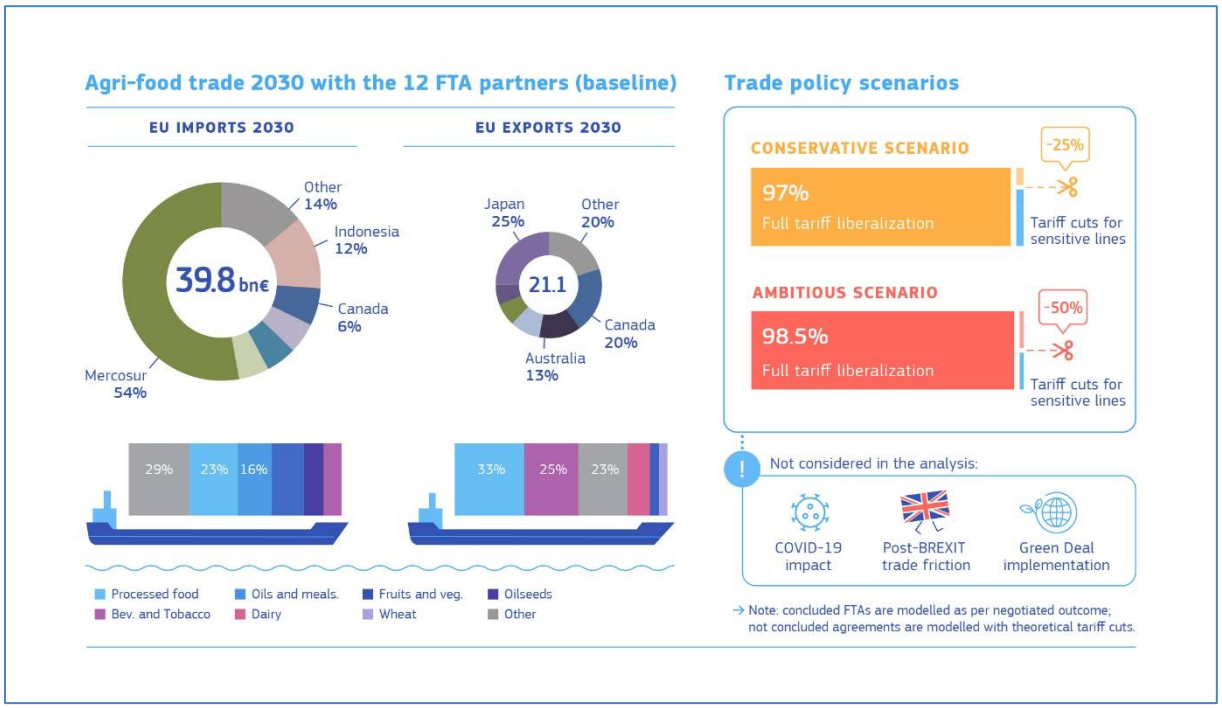
The two models were operated in an integrated manner, exploiting their respective strengths. While the MAGNET model was calibrated to the EU Medium-Term Agricultural Outlook 2019-2030 projections derived with the Aglink-Cosimo model, the latter introduced the net trade shocks coming from the bilateral trade simulations provided by MAGNET. In a nutshell, the analysis of bilateral trade flows and the extensive product coverage in MAGNET were combined with the detailed analysis of the impact on the EU agricultural sector in Aglink-Cosimo. Both models have full global coverage but the focus in this analysis is on the EU.

The study considers two trade liberalisation scenarios (a conservative and an ambitious one), and compares them with the situation in 2030 without the implementation of the selected FTAs (baseline).

In both scenarios, concluded negotiations (with Canada, Japan, Mercosur, Mexico, and Vietnam) were modelled based on their actual outcome, in terms of tariff concessions and bilateral tariff rate quotas (TRQs). This allowed the models to reflect more closely the expected impact of those agreements compared with the 2016 study, which considered theoretical scenarios for all agreements except Canada and Vietnam.

For the other FTAs covered (with Australia, Chile, Indonesia, Malaysia, New Zealand, the Philippines, and Thailand), the following theoretical concessions were implemented:

1. in the conservative scenario, full tariff liberalisation of 97% of HS 6-digit lines and a partial (25%) tariff cut for the other lines (sensitive products);
2. in the ambitious scenario, full tariff liberalisation for 98.5% of HS 6-digit lines, and a partial (50%) tariff cut for the other lines (sensitive products).



Source: Authors' elaboration

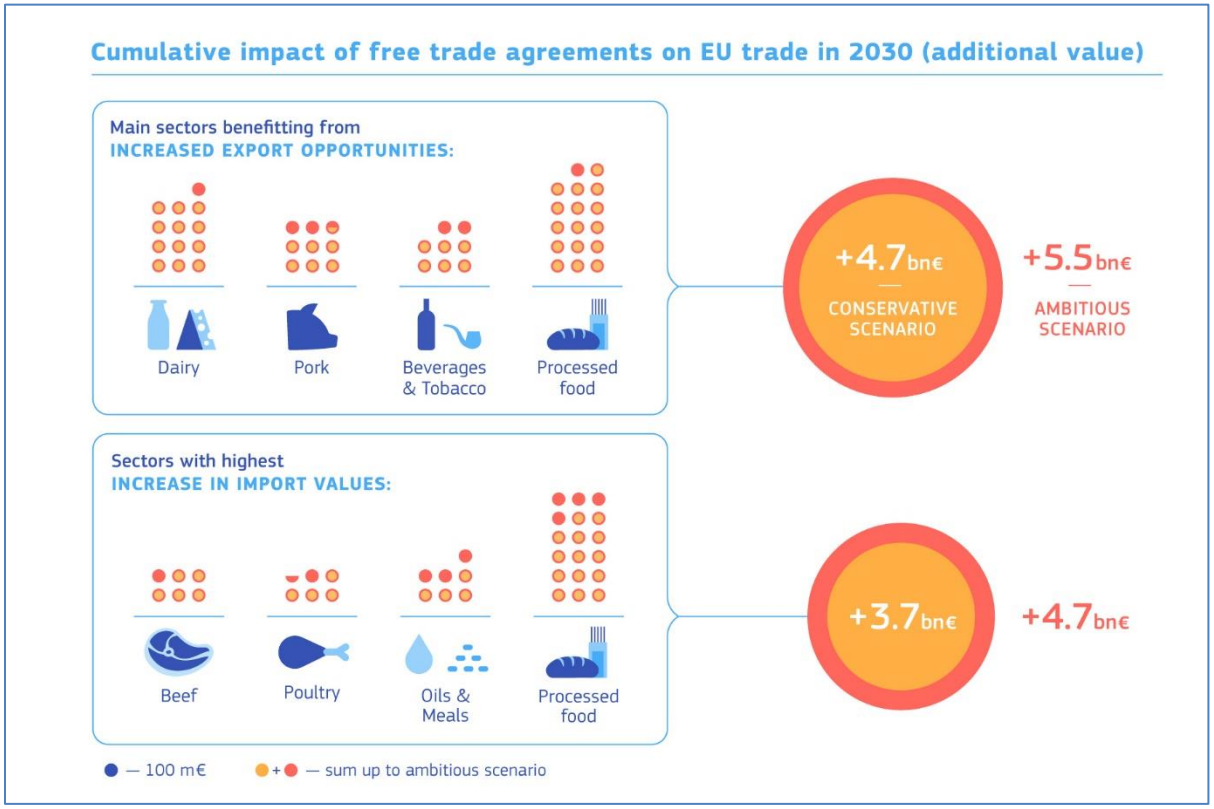
These assumptions have been applied identically for all those trade agreements and symmetrically for both the EU and the relevant trading partners. The selection of sensitive lines subject to partial tariff cuts, rather than full liberalisation, was primarily based on expert judgement, and complemented by using statistical indicators, notably the tariff revenues associated to each tariff line.

Main outcomes of the study

The results show a positive cumulated impact on the overall EU agri-food trade balance, thanks to the capacity of the EU to strongly increase its exports to the 12 FTA partners (+29% exports in the ambitious scenario, compared to +13% imports). Overall increases in exports and imports are indeed quite balanced and comparable, with a slightly higher impact on exports, and moderate impacts on production and producer prices.

The study confirms the findings of the 2016 study, notably as regards the sensitivity of specific sectors, albeit with more moderate impacts due to the inclusion of the concrete outcome of concluded agreements as well as the capacity to model TRQs granted. Results are consistent with the expectation that providing increased market access in the form of TRQs (rather than mere tariff cuts) for the most sensitive products enables the EU to better protect the related sectors.

Lastly, the study highlights the positive impact of the trade agreements for the EU's trading partners. They increase their share of the EU market at the expense of other trading partners.



Source: Authors' elaboration

The EU's agri-food exports to the 12 FTA partners increase by EUR 5.2 billion (25%) in the conservative scenario and by EUR 6 billion (29%) in the ambitious scenario (compared to the baseline in 2030). Additional exports are mainly directed to Japan, Mercosur, Thailand, and Vietnam. With agri-food exports to other EU trading partners slightly decreasing due to the increased access to the 12 FTA countries, the overall increase of EU agri-food exports is EUR 4.7 billion (2.8%) in the conservative scenario and EUR 5.5 billion (3.3%) in the ambitious one.

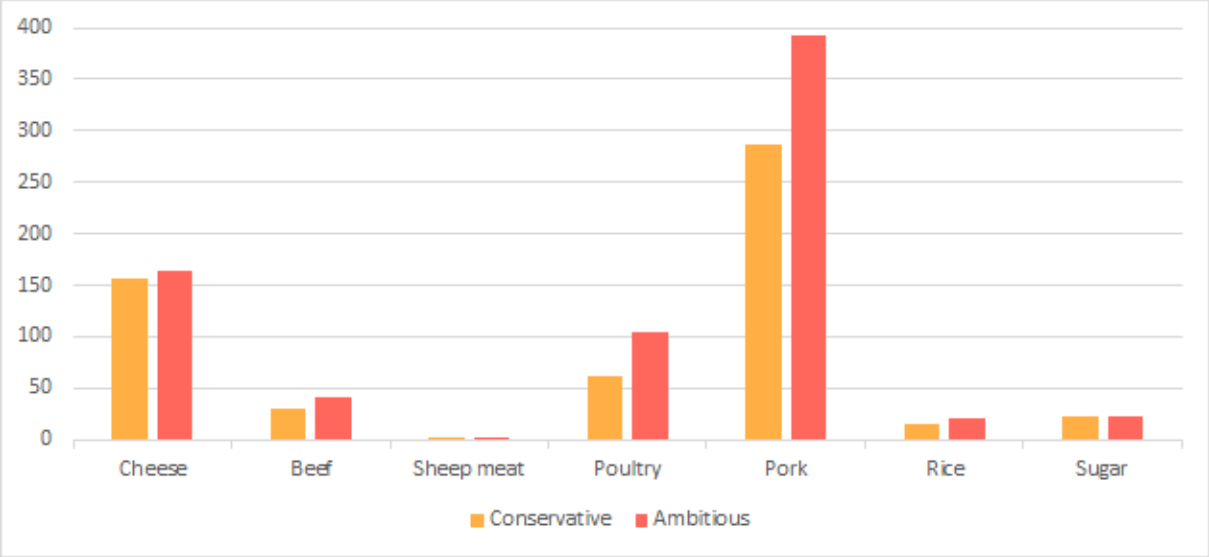
The conservative and the ambitious scenarios present limited differences in terms of impacts. This is because most of the market access increase in both scenarios is attributable to the concluded FTAs, which cover the biggest trading partners of the selection of 12 FTAs (Canada, Mercosur, Mexico, Japan, and Vietnam). This increase is almost identical in both scenarios as the concessions modelled are unchanged. The additional market access enjoyed by the other FTA partners (Australia, New Zealand, Thailand etc.) in the ambitious scenario compared to the conservative one is relatively small. The situation varies however between agricultural sectors. For example, the difference between the two scenarios is significant for the sheep sector, as the main trading partners concerned are Australia and New Zealand, and for the rice sector, where Thailand plays a prominent role.

Key results

Largely consistent with the 2016 study, the results show substantial trade opportunities for certain agricultural sectors (dairy, pork meat, wheat, and wine and beverages). Exports of processed agricultural products increase by 3.1% in the ambitious scenario (EUR 1.7 billion), wine and beverages (and tobacco) see

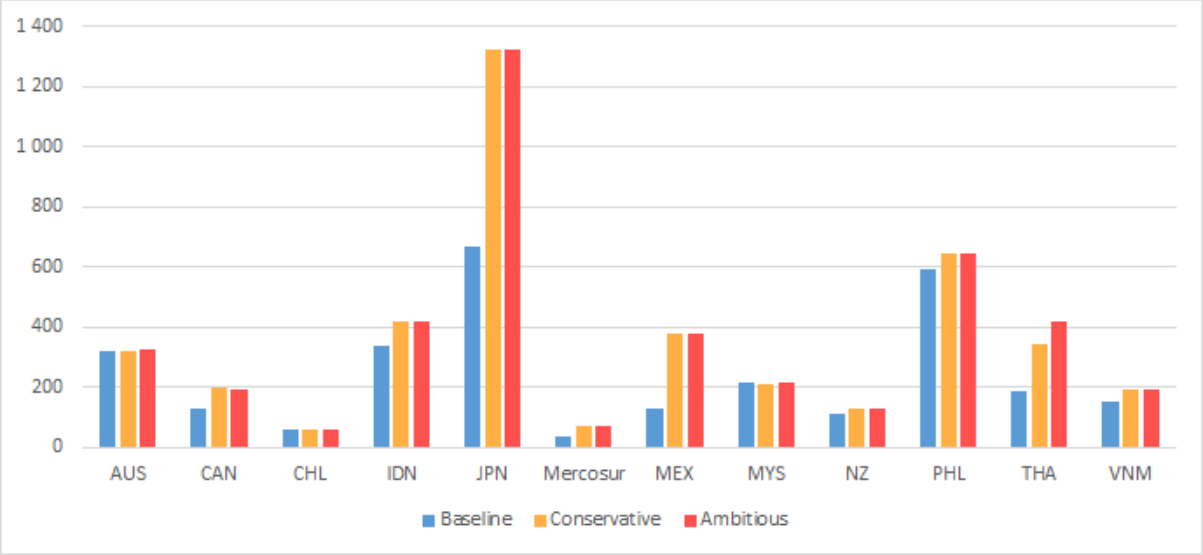
their exports increasing by 2% under the same scenario (EUR 834 million). EU dairy products and pork show particularly significant increases in exports, production, and producer prices. Dairy exports (cheese, butter, skimmed milk powder, whey) increase by 7.3% in the ambitious scenario (EUR 1.3 billion), with Japan as the main destination of these additional exports. The effect of higher trade on the dairy complex is an increase in domestic milk production of about 0.2% and in milk prices (1.3%), altogether adding EUR 890 million to the market receipts of milk producers in 2030. Pork exports increase by 8.9% (EUR 914 million) in the same scenario, corresponding to about 400 000 tonnes in carcass weight equivalent. Domestic pork consumption decreases by 0.8% (141 000 tonnes) in the ambitious scenario. In the conservative (ambitious) scenario, the 3.3% (4.6%) price increase combined with a 0.7% (1%) production expansion raises the value of expected EU pork production in 2030 by EUR 1.4 (2) billion.

EU exports for selected markets – 2030, change vs. baseline, thousand tonnes



Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

EU dairy exports to the 12 FTA countries, 2030, EUR million



Source: Authors' calculation from MAGNET results

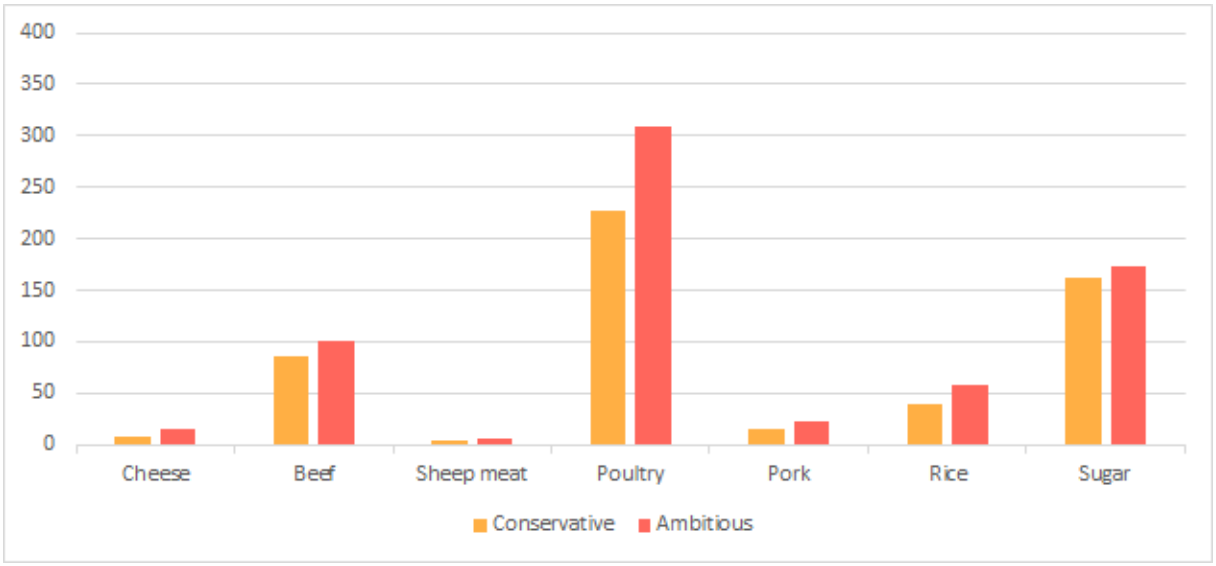
The trade balance of the EU in the wine and beverages sector improves by 1.3% under the conservative scenario and 1.8% under the ambitious scenario. The trade balance towards the 12 FTA partners improves

more sharply. The other food sectors (processed products) show positive export possibilities for the EU as well as for FTA partners.

The study confirms the sensitivities highlighted in the 2016 study, notably for beef, sheep meat, poultry, sugar, and rice. However, it shows significantly smaller negative impacts on beef, sheep meat, poultry, and sugar than in the 2016 study. This is mainly because the updated study incorporates the concrete negotiated outcome of concluded agreements, in which trade concessions for the most sensitive products are generally provided in the form of TRQs, while in 2016 theoretical scenarios had been constructed in the form of tariff cuts with no volume limit.

The implementation of the 12 FTAs would increase the value of EU beef imports under both the conservative and the ambitious scenarios, by 21% and 26% respectively (EUR 512 million and EUR 614 million respectively). Most of the increase in imports derives from Mercosur (EUR 422 million under both scenarios, i.e., 82% and 69% of the increase in imports depending on the scenario), with Australia also gaining market access (with EUR 45 million and EUR 121 million additional exports respectively). In volume, this increase amounts to additional 85 000 tonnes in carcass weight equivalent of beef imported (conservative scenario) and 100 000 tonnes (ambitious scenario) compared to the baseline in 2030. Producer prices would fall by about 2.4% in both scenarios with marginal effects on consumption (0.6%) and production (–0.3%), due to an increase in exports to Japan and the Philippines and a production strongly linked to the development of the dairy herd.

EU imports for selected markets – 2030, change vs. baseline, thousand tonnes



Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

Sheep meat imports increase by 2.1% (3.7%) under the conservative (ambitious) scenario. This translates into a price decline of 1.9% (3.1%), higher consumption (0.2% and 0.4%), and lower production (-0.2% and -0.4%).

EU production for selected markets – 2030, % change vs. baseline

Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

Overall, rice imports increase between 2.7% and 3.9% under the conservative and ambitious scenarios. The additional imports are dominated by Thailand (which under the theoretical simulated scenarios benefits from improved market access through a tariff cut with no volume limit), with an increase of between EUR 51 million and EUR 108 million. At the same time, Mercosur and Vietnam imports, which are constrained by the TRQ agreed in the concluded FTAs, remain stable under both scenarios. Under the ambitious (conservative) scenario, EU rice production and prices drop by 1.5% (1%) and 7% (4.8%) respectively.

EU producer prices for selected markets – 2030, % change vs. baseline

Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

Sugar trade flows under both scenarios are mainly affected by the agreement with Mercosur, a major world player. Mercosur countries increase their exports to the EU by EUR 116 million under both the conservative

and ambitious scenarios. Consequently, compared to the baseline total sugar imports increase by 12% to 13% respectively.

Overall, both the conservative and the ambitious scenarios show an increase in EU imports from the 12 FTA partners in almost all agri-food products, in most cases accompanied by a (lower) decrease in imports from other regions. Therefore, the market share of the 12 FTA partners in the EU increases significantly, particularly in the beef and poultry sectors. EU total agri-food imports increase by 3.3% (EUR 3.7 billion) and 4.2% (EUR 4.7 billion) respectively. Imports from the 12 FTA partners increase by EUR 3.9 billion (10.2%) in the conservative scenario and by EUR 5.1 billion (13.3%) in the ambitious scenario, which enables these countries to gain market share (by more than 3 percentage points). The highest increase in EU imports is reported from Mercosur countries. By contrast, the countries other than the 12 considered FTA partners face a decrease in their market share to the benefit of the regions negotiating or having concluded an agreement with the EU.

The study therefore confirms that the EU trade agenda has the potential to be beneficial for the EU agri-food sectors. The study also confirms the vulnerability of specific agricultural sectors (i.e., beef, sheep meat, poultry, sugar, and rice) towards growing imports following increased market access. For trade agreements to remain acceptable, both economically and socially, and tenable for the most sensitive EU agricultural sectors, the study indicates that improved market access in the form of TRQs would be considered a safer choice.

Caveats of the analysis

One of the main limitations of this report relates to the coverage of agricultural products in the economic models used. The CGE model MAGNET has a comprehensive coverage of the economy, and thus of the agri-food sector. However, the level of product disaggregation, in particular for the processed food sectors, is quite limited. The PE model Aglink-Cosimo provides more detailed results at the agricultural commodity level, although its product-coverage is not exhaustive, as it does not model some important agricultural products such as fruits and vegetables, wine, olive oil and processed agricultural products in general. As regards the geographical disaggregation, and given the complexity of the analysis, results are provided only for the EU. Furthermore, the considered scenarios investigate the effects of tariff liberalisation but do not factor in the analysis the possible reduction of non-tariff measures (NTMs).

The report adopted a purely technical assumption of a duty-free, quota-free future trade relationship with the United Kingdom. The assumption of continuation of duty free, quota free (DFQF) trade relation between the EU and the United Kingdom as from 2021 is consistent with the outcome of the recent EU–United Kingdom Trade and Cooperation Agreement negotiation, although the other assumptions considered (e.g., the complete absence of non-tariff barriers between the EU and the United Kingdom, or the United Kingdom keeping the same FTA architecture of the EU over the medium term) are less realistic.

Finally, accounting for the impacts of the COVID-19 pandemic, the impact of the European Green Deal and other relevant factors related to trade policies such as environmental and social sustainability falls beyond the scope of the report.

1 Introduction

1.1 Context

The European Union is a driving force for global openness and integration. The EU's agricultural trade is a strong component of the overall trade with a positive balance and strategic importance. Trade agreements are the legal framework to establish, among others, preferential tariff treatment between individual countries or regions.

The European Commission regularly runs, for each agreement separately, impact assessments before the launch of the negotiation, and sustainability impact assessments (SIAs) during their conduct. Yet, the assessment of trade agreements in isolation does not provide insights into the combined, cumulative, impact of the various agreements the EU is negotiating or signing. Furthermore, a more disaggregated analysis of the agricultural sector than is typically done in the Commission's SIAs has been a reiterated request. Therefore, in 2016, when different Member States repeatedly stated further analysis was needed to assess the potential impact of different trade negotiations on EU agriculture, the European Commission mandated the Joint Research Centre (JRC) to carry out a study, which was published in the same year (Boulanger et al., 2016). In July 2019, following the political conclusion of the EU–Mercosur free trade agreement (FTA), former Commissioner Hogan, the then Commissioner for Agriculture and Rural Development, announced at the Agriculture and Fisheries Council an update of the 2016 cumulative impact study, covering the economic aspects of agricultural tariff reduction. This was reiterated by Agriculture Commissioner Wojciechowski at his confirmation hearings.

The aim of this study is to provide an assessment of the economic impacts on the EU agriculture of 12 FTAs, both concluded and under negotiation. Other important aspects of the EU trade policy, such as the social and sustainability aspects, as well as the impact of the Green Deal fall outside the scope of this study. The current study builds on and updates, under different relevant aspects (Box 2), the study published by the JRC in 2016.

As the study was launched after the departure of the United Kingdom from the EU and before the outcome of the negotiations on the future relationship between the EU and the United Kingdom had been reached (Box 1), a purely technical assumption was made regarding the future bilateral relationship between EU and United Kingdom.

Furthermore, as too many uncertainties surrounded the impact of the COVID-19 crisis at the time of launching this exercise, the consequences of the COVID-19 crisis were not considered in this exercise.

Box 1: The specific issue of the future trade relation between the EU and the United Kingdom

Since 1 February 2020, the United Kingdom has no longer been member of the EU. At the time of conducting this study, there was not yet clarity on the future relationship between the EU and the United Kingdom. As indicated in the political declaration and in the negotiation directives of the EU (and of the United Kingdom), a tariff-free, quota-free trade agreement is envisaged (conditional upon robust provisions ensuring a level playing field and an agreement on fisheries, among others), making this the default or preferred option. This study hence assumes duty-free, quota-free (DFQF) trade between the EU and the United Kingdom, both in the baseline and the scenarios. As the analysis is comparative, the report does not focus on the quantitative specifics of the EU-United Kingdom relationship. Being aware that even under the assumption of a DFQF trade relationship there would be additional trade frictions when compared to participation in the single market, this is not captured in the modelling approach. This is in line with the general set-up of the study, which does not consider changes in non-tariff measures (NTMs) after the conclusion of FTAs, given the difficulty to quantify them. In Box 3 these NTMs are further discussed qualitatively. In addition to the DFQF assumption, we envisage that both the EU and the United Kingdom will apply the apportioned World Trade Organization (WTO) tariff rate quotas (TRQs). For the trade relationship of the United Kingdom with the rest of the world, we assume the proper implementation of the trade deals that the United Kingdom has already secured with third countries. The remaining trade between the United Kingdom and other countries would take place under most-favoured-nation terms, with the assumption that the United Kingdom would maintain a tariff level equal to the EU common external tariff.

1.2 Agreements

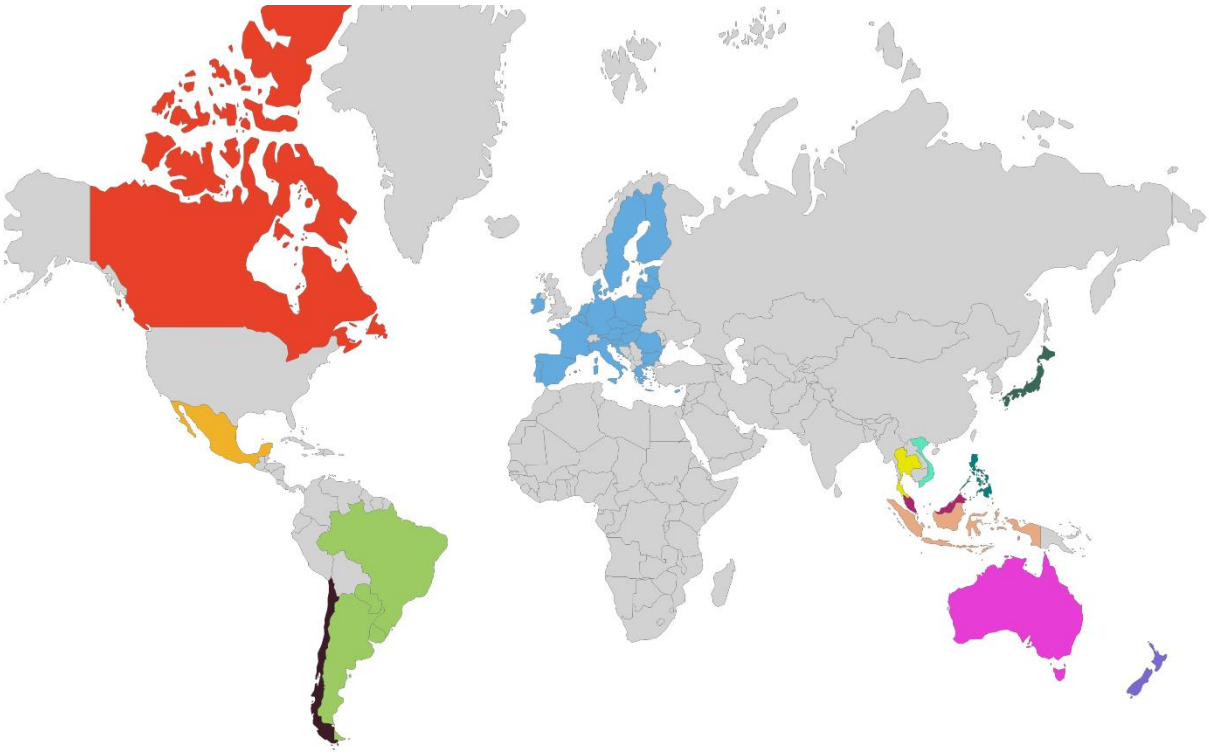
The study considers the FTAs recently concluded or implemented by the EU, i.e., those with Canada, Japan, Mercosur, Vietnam, and the modernisation of the agreement with Mexico, as well as trade agreements under negotiation (Australia, Indonesia, Malaysia, New Zealand, the Philippines, and Thailand). Finally, the modernisation of the agreement with Chile is included to complete the picture. Twelve trade agreements, either concluded or under negotiations, are therefore covered.

Some of the trade deals considered in the previous study (Boulanger et al., 2016) have since entered into force (e.g., Canada, Japan, and Vietnam) and are gradually phased-in. To guarantee coherence with the previous study, the gradual phasing-in of those agreements is included in the updated study as part of the set of FTAs scenarios. This means that the related concessions (and their impact) were not included in the baseline to be able to measure their impact.

Regarding the United States, and contrary to the 2016 study, this update does not contemplate a bilateral FTA - in line with the most recent EU trade policy orientations.

Agreements concluded in the past and already applied for a long period of time (e.g., with Korea or Ukraine) were integrated into the reference scenario until 2030 (the baseline). The modification of the EU–Ukraine FTA in 2020 to amend the trade preferences for poultry meat and poultry meat preparations and the related allocation to Ukraine of 50 000 tonnes of additional duty-free market access for poultry was included in the baseline.

Figure 1: FTAs of the study at a glance



1.3 Brief review of previous studies

Many studies have simulated a bilateral trade agreement between the EU and individual countries/trading blocs with similar modelling tools to those used in this study. Since the background circumstances or baselines change over time and the details of the assumed scenarios vary considerably, close comparisons of the quantitative results are not appropriate. Nonetheless, these studies can help to form expectations about directions of change and orders of magnitude. Furthermore, they reveal the implications of modelling assumptions and features. Nilsson (2018) shed some light on some critical areas which require further efforts to increase the robustness of model-based simulations.

Of particular relevance are the SIAs, which provide an in-depth analysis of the potential economic, social, environmental, and since 2012, human rights impacts, of ongoing trade negotiations. As of September 2020, completed SIAs for the countries/regions under scrutiny in this study are available for the Comprehensive Economic and Trade Agreement (CETA) between the EU and Canada and for the FTAs between the EU and Japan, the EU and the Association of South-East Asian Nations (ASEAN) (the relevant countries included are Indonesia, Malaysia, the Philippines, Thailand, and Vietnam), the EU and Mexico and, the EU and Indonesia ([1]). Ongoing or recently concluded SIAs include support of FTA negotiations between the EU and Australia, the EU and New Zealand, the EU and Chile, the EU and the Philippines, the EU and Malaysia, the EU and Mercosur ([2]).

It should be highlighted that the EU institutions, international organisations and various national or private research services and institutions also produce research papers related to FTAs. For instance, the European Commission put together a JRC study focusing on the agri-food sector (Burrell et al., 2011) and a global impact assessment (Thelle and Sunesen, 2011) to provide a comprehensive analysis of an FTA between the EU and Mercosur.

Most of the referred assessments are carried out with computable general equilibrium (CGE) models. Indeed, in an ample review of models for the quantification of (mega-) regional trade agreements, the advantages of employing a CGE model type for multisector, multiregion trade analysis are featured in Narayanan et al., (2015). Yet, in order to analyse the specificities of the agri-food sector, e.g., through a higher product disaggregation or with physical quantities, partial equilibrium (PE) models are often used to complete a CGE analysis as was done in the EU-Japan Trade SIA (European Commission (2016b) which complements CGE results with the use of a PE modelling framework.

The use of the Modular Applied GeNeral Equilibrium Tool (MAGNET) (CGE) and Aglink-Cosimo (PE) models in the present study as well as in the previous JRC report on the cumulative economic impact of future trade agreements on EU agriculture (Boulanger et al., 2016) allows the complexity of the cumulative FTAs to be addressed while providing the details needed for the agri-food sector analysis. The JRC report on the potential EU–Mercosur FTA (Burrell et al., 2011) also employed two types of models. Overall, Boulanger et al., (2016) show relatively balanced cumulated impacts in terms of trade, production, and producer prices, for the EU agricultural sector as a whole. However, significant differences exist at sectorial level, with some of them showing considerable potential for additional exports such as dairy products (particularly cheese and skimmed milk powder), pork, cereals (in particular wheat), and high value/processed products of the agri-food industry (such as beverages, notably wine and spirits). On the other hand, some sectors or commodities are potentially coming under pressure. This is the case for beef, rice and to a lesser extent poultry and sugar. Note that the FTAs coverage, scenarios and modelling assumptions differ between the 2016 study and current update as explained in Box 2.

The 2016 study was widely used by policy-makers and stakeholders. Academic circles also took note of the approach and acknowledged Boulanger et al., (2016) indicating that 'the link between Aglink and MAGNET thus provides an example how borrowing from a sectoral model implicitly transfers expert knowledge and detailed plausibility assessments into CGE baseline construction' (Delzeit et al., 2020, p.173).

([1]) As some SIAs are outdated and no longer provide an up-to-date picture of the potential impact of possible agreements, new SIAs are ongoing to support the negotiations with Mercosur and two ASEAN countries, i.e., Philippines and Malaysia.

([2]) See the European Commission's dedicated webpage on SIAs: https://ec.europa.eu/trade/policy/policy-making/analysis/policy-evaluation/sustainability-impact-assessments/index_en.htm

Box 2: The main differences between this report and the study published in 2016 (Boulanger et al., 2016)

In 2016, the JRC published a study analysing the cumulative economic impact of potential ongoing and upcoming FTAs between the EU and 12 trading partners (Australia, Canada, Indonesia, Japan, Mercosur, Mexico, New Zealand, the Philippines, Thailand, Turkey, Vietnam, and the United States) on the EU agricultural sector. The study analysed two theoretical trade scenarios, conservative and ambitious, defined in function of different levels of ambition in the negotiations. Overall, the results show relatively balanced cumulated impacts in terms of trade, production, and producer prices, for the EU agricultural sector as a whole.

The represent study, building on the one presented in 2016, differs from its predecessor in some crucial points making a full comparison between the two difficult.

The main differences between the two studies are the following:

- The studies consider two different sets of FTAs (Chile and Malaysia substitute the United States and Turkey) to reflect changes in the EU trade agenda.
- While in 2016 most of the FTAs considered were not yet concluded (only Canada and Vietnam had already been signed), in the current study 5 out 12 are already concluded (Canada, Japan, Mercosur, Mexico and Vietnam). Concluded FTAs are not assessed through theoretical scenarios but by modelling the tariff shocks included into the agreements, notably explicitly including TRQs for relevant products.
- Modelling the negotiated outcome of some significant FTAs is one of the biggest differences compared to the 2016 study, as the impact of a TRQ expansion is very different from a generalised reduction of a tariff. In the first case the incentive to export increases only for a limited volume of product. Whereas, a tariff reduction provides an increased incentive to export, as it reduces the export cost without a given quantity limit. Therefore, the effects of TRQs and tariff reductions are not comparable. Although the relative size of the impacts depends on many factors, such as the volume of the TRQ and the extent of the tariff cut, tariff reductions generally produce larger impacts on imports compared to TRQs.
- The European Union, following the departure of the United Kingdom, has 27 Member States. The current trade structure of the European Union, in terms of imports, exports and net trade, is not the same as the one modelled in the 2016 study.
- The global CGE model MAGNET database has been extended to include a more refined agricultural sector disaggregation compared to the usual Global Trade Analysis Project (GTAP) one. The current study includes a disaggregation between beef (cattle) and other red meat, sheep meat in particular, and a disaggregation between pork (pig) and poultry (chicken).
- Within the global CGE model MAGNET database, the other food sector now contains only agricultural related commodities, while all processed fish are contained in the fish aggregate. For this reason, results related to the other food aggregate can be presented this time.
- The global CGE model MAGNET base-year (including the economic structures of the included countries, the bilateral trade structures and tariff structure) has been updated from 2011 to 2014.
- The global CGE model MAGNET is calibrated to the EU Medium-Term Agricultural Outlook published in December 2019 (European Commission, 2019).
- The horizon of the study was extended to 2030.

2 Methodology

This section explains the choice of the modelling tools for the cumulative impact analysis of the trade agreements in agriculture and provides a short description of employed models. Furthermore, this section clarifies how the models were linked to capture complex global trade flows and EU agri-food sector specificities. Finally, it sheds some light on the caveats of the approach.

2.1 Economic models for agri-food trade analysis

Economic models are the main tools for the analysis of complex trade relations and have been applied on many occasions for the assessment of EU trade agreements with third countries. Based on studies commissioned by the Directorate-General for TRADE, the European Commission (2012) estimated that the cumulative impact of all ongoing and potential negotiations could increase EU gross domestic product (GDP) by 2% (more than EUR 250 billion) in the long run. Most studies focus on specific trade agreements independently while the analytical question at stake of this report is the cumulative impacts of multiple trade agreements on EU agriculture. This creates even more complexity and requires a specific approach to account for the multitude of agreements and focus on the peculiarity of the agri-food sector.

Multiregion neoclassical CGE models have become the de facto tool of choice for conducting *ex ante* assessments of multilateral trade agreements (e.g., potential Doha Round conclusion (Bouet and Laborde (2010)), bilateral trade agreements (Bureau et al., (2014)) or explicitly comparing several agreements (Disdier et al., (2016). The cumulative analysis of FTAs has been only rarely covered in agri-food related research. In European Commission (2006), one of the scenarios on a concluded EU-ASEAN FTA occurs in conjunction with the conclusion of an EU-Mercosur agreement, in addition to ASEAN FTAs with Japan and the United States.

An important strength of CGE models is their ability to represent all sectors of the economy in all the countries and regions modelled. Therefore, they take into account all the interactions among these sectors through domestic and international linkages. They provide highly relevant information about possible trade-offs between different (agri-food) sectors in the event of multiple bilateral trade liberalisation agreements. They enable a panoramic view across all those economies that are distinguished separately within the model and quantify which sectors might be affected and in which way.

Being global, the relatively aggregated commodity structure of CGE models and their somewhat standardised treatment of behavioural functions across commodities and countries can omit (or treat in a more stylised way) certain sectoral particularities or policy constraints, which are specific of a single industry or product. That is where PE models provide complementary features, in particular through a more disaggregated commodity structure within agriculture, and the introduction of commodity specific interrelationships. The Organisation for Economic Co-operation and Development (OECD) (2016) adopted a similar methodology to assess the impacts of current agricultural policies and reform, using the OECD's CGE model METRO, together with the PE model Aglink-Cosimo.

2.2 The CGE model MAGNET

The present study employs a state-of-the-art multi-sector, multi-region recursive dynamic CGE model called MAGNET (Woltjer and Kuiper, 2014). MAGNET has been recently widely employed to simulate the impacts of agricultural policies (M'barek et al., 2017), land issues (Sartori et al., 2019) and sustainable development goals (SDGs) (Philippidis et al., 2020) on the global economy.

The model was developed at Wageningen Economic Research and is applied and further extended at Wageningen Economic Research, the Thünen Institute and by the European Commission's JRC. It is a core model of the integrated Modelling Platform for Agro-economic Commodity and Policy Analysis (iMAP) (M'barek et al., 2012, 2015). Detailed information on the MAGNET tool and its use can be accessed on the European Commission's Modelling Inventory Database and Access Services (MIDAS) ([3]). A brief description of the tool with a view to coherent cross-cutting policy assessments was prepared by Kuiper et al., (2019). The capacity of MAGNET for system-wide analysis has been recognised recently by the United Nations, featuring the tool in the publication on SDGs good practices, success stories and lessons (United Nations, 2020).

([3]) See the European Commission's dedicated webpage on SIAs: https://ec.europa.eu/trade/policy/policy-making/analysis/policy-evaluation/sustainability-impact-assessments/index_en.htm

MAGNET is also a reference model in many European Commission framework programmes and Horizon 2020 projects in which the JRC is involved (e.g., FoodSecure, Agricistrade, Susfans, BioMonitor, BatModel).

MAGNET is based on the Global Trade Analysis Project (GTAP) model, which accounts for the behaviour of households, firms, and the government in the global economy and how they interact in markets (Corong et al., 2017). The model includes the food supply chain from farm, as represented by agricultural sectors - via food processing industries and food service sectors - to fork taking into account bilateral trade flows for major countries and regions in the world.

The model has been employed for several trade studies, in this context most relevant on FTAs between the EU and 12 regions as in Boulanger et al., 2016. Scenarios of other trade agreements analysed with MAGNET include the following publications: between the EU and North Africa in Boulanger and M'barek (2013), between the EU and neighbour countries in Rau (2014), between the EU and the United States in Berkum et al., (2014) and Sanjuán et al., (2017), a multilateral liberalisation in M'barek et al., (2017) and Van Meijl et al., (2020), and between the EU and eastern European countries in Philippidis et al., (2018).

To characterise the peculiarities of agricultural markets, the model accounts for the heterogeneity of land usage by agricultural activity; a regional endogenous land supply function; the sluggish mobility of capital and labour transfer between agricultural and non-agricultural sectors with associated wage and rent differentials; the inclusion of explicit substitution possibilities between different feed inputs in the livestock sectors; and additional behavioural and accounting equations to characterise EU agricultural policy mechanisms (e.g., production quotas, single farm payment, coupled payments, rural development measures) (Boulanger and Philippidis, 2015).

Trade is modelled in a way that domestically produced goods can either be sold on the domestic market or to other regions in the world. Similarly, domestic intermediate, private household and government demand for goods can be satisfied by domestic production or by imports from other regions in the world (i.e., the 'Armington assumption'). The Armington assumption implies that an increase in the domestic price relative to imports leads to an increase in demand for imports relative to domestic goods. Similarly, if imports from one source country become more expensive, there will be substitution towards imports from another, cheaper, source country.

Other regions are accounted in with their own import and export taxes. Sourcing of imports happens at the border, after which - on the basis of the resulting composite import price - the optimal mix of import and domestic goods is derived.

Demand for and supply of commodities and endowments meet in markets, which are perfectly competitive and clear via price adjustments.

For the purpose of this study, the model has been enhanced with an improved representation of bilateral TRQs, the implementation relies on mixed complementarity programming. The model defines a TRQ by three parameters: the in- and out-of-quota tariffs and the in-quota level. For each TRQ, three regimes, depending on demand conditions, are accounted. If import demand is lower than quota level, the in-quota tariff applies. If the demand reaches the quota level, the applied tariff is still the in-quota one, but rents start to be generated. The rents can be allocated either to the importing or exporting country (in this study they are allocated to importers). If demand exceeds the quota, the out-of-quota tariff applies and the rent generated will be fixed and equal to the difference between the out-of- and in-quota rates (van der Mensbrugghe, 2019). When demand exceeds quota, out-of-quota trade appears. A shock that expands the quota level, given the model construction, will result in the transformation of the existing out-of-quota trade into in-quota trade, as the exporters with the competitiveness to export at out-of-quota tariff will now fill the quota level. The quota will be filled until exports (whose marginal productivity is decreasing) are competitive enough to export at the in-quota tariff. Out-of-quota trade will appear if the marginal productivity of the exporters is still competitive enough to export at the out-of-quota tariff. The mechanism that rules the model might differ from the market mechanisms.

By construction in CGEs, quantities and values are equal at the base year. That is, basic prices in the model are normalised to one at the base year. CGE models are linearly homogenous in prices, in other words if all prices in the model are changed by *x*%, the quantities would not change hence values would also increase by *x*%. This implies that CGEs are real models where the money is assumed to be neutral, i.e., the model does not allow financial inflation due to changes in financial markets such as money supply. Hence the focus of CGE models is upon movements in relative prices and absolute prices are not quantified by the model. Keeping this in mind, one can quantify CGE model results either as changes in quantities or in values. The

former would ignore the effects of changes in relative prices due to changing demand and supply conditions. The latter, on the other hand, would reflect the changes in values and prices together.

This report presents CGE model results in value terms since the focus is on the gains and losses from FTAs at the EU level.

2.3 Sector and spatial aggregations

This study employs a fully consistent and academically recognised global database, based on contributions from members of the GTAP network and constructed by the GTAP team at Purdue University, United States (Aguiar et al., 2019). The GTAP database, in its Version 10, contains a complete record of all economic activity (i.e., production, trade, primary factor usage, final and input demands, taxes and trade tariffs and transport margins) for 65 activities and 141 regions for 2014. The MAGNET model includes an additional provision of disaggregated sectors compared to the original GTAP database. These newly aggregated sectors include a disaggregation between beef (cattle) and other red meat (sheep, goat, horses), between pork (pig) and poultry (chicken and other animal products), and the inclusion of other sectors such as animal feed, biofuels, and fertilisers among others. The analysis can provide, although not detailed, impacts for a large number of processed agricultural products that fall under the other food category. This is a very large category containing, for example, a variety of food preparations, prepared and preserved fruits and vegetables, fruit juices, starches, bakery products, cocoa, chocolate, and sugar confectionery. Compared to the 2016 study, this aggregate incorporates only manufactured products that fall in the realm of agriculture while manufactured fishery products are now included in the fishery sector aggregate.

The following sectorial disaggregation has been performed (Table 8 in the annex for a detailed sectorial list).

- **Primary agriculture (14 commodities):** wheat; paddy rice; other grains; oilseeds; sugar beet and cane; vegetables, fruits and nuts; other crops; cattle; live animals (sheep, goat); live pigs; chicken and other animal products; raw milk; plant fibres; wool.
- **Food and beverages (10 commodities):** beef; sheep meat (sheep, goat, horses); pork; poultry; dairy; sugar; oils and meals; rice; beverages and tobacco; and other food;
- **Other sectors (16 commodities not shown):** fish; forestry; crude oil; gas; coal; light manufacture; heavy manufacture; fertilisers; biodiesel; biogasoline; biogasoline by-products; petrol products; electricity; gas distribution; food services; services.

For the sake of consistency between the two models, the CGE results will be presented aggregating some of the sectors: plant fibres, wool, and other crops (other crops), paddy and processed rice (rice), sugar beet and cane and raw sugar (sugar), vegetable oils and fats, oilcake feed and crude vegetable oil (oils and meals).

The regional disaggregation comprises the following regions (Table 9 in the annex provides a detailed countries/regions list):

- The EU (aggregation of all 27 Member States)
- The **12 trading partners involved in bilateral trade agreements covered by this study**([4])**:**
  - Australia (AUS)
  - Canada (CAN)
  - Chile (CHL)
  - Indonesia (IDN)
  - Japan (JPN)
  - Argentina, Brazil, Paraguay, and Uruguay as members of Mercosur (Mercosur)
  - Mexico (MEX)
  - Malaysia (MAL)

([4]) Compared to Boulanger et al., (2016), this analysis does not account for possible FTA with the United States and Turkey and includes Chile and Malaysia.

- New Zealand (NZ)
- Philippines (PHN)
- Thailand (THA)
- Vietnam (VNM)

- The **other regions**, which in the rest of the report will be mainly aggregate into a Rest of the World aggregated regions are the following:
  - United States
  - rest of Europe (RoE)
  - rest of America (RoAm)
  - rest of Asia (RoAs)
  - Middle East and North Africa (MENA)
  - sub-Saharan Africa (SSA)
  - rest of the World (RoW)

2.4 The PE model Aglink-Cosimo

Aglink-Cosimo is a global recursive-dynamic PE model of agricultural commodity markets. The model is developed and managed jointly by the OECD and the Food and Agriculture Organization of the United Nations (FAO) secretariats. It is primarily known for its use in generating 10-year agricultural market projections that are updated on a yearly basis and published in the OECD–FAO Medium-Term Agricultural Outlook in June (e.g., OECD/FAO 2020). The OECD-FAO outlook exercise starts with the submission of structured questionnaires by national agencies. The information from those questionnaires leads to a pool of detailed country-specific agricultural and trade policies, current and expected, that are parameterised to facilitate the elicitation of a global medium-term consensus of agricultural markets. The resulting sets of domestic and global supply, demand, and price projections, collectively referred to as 'baseline', serve as a reference for the implementation of what-if policy-relevant scenarios with this or other large-scale simulation models.

Within a defined group of users and contributors from national agencies and research institutes, the JRC (Unit D.4) of the European Commission inherits annually the default model version by the OECD. With in-house extensions and technical updates, the Commission's version of the model is used for the purpose of producing the EU Medium-Term Agricultural Outlook, published annually in December (e.g., European Commission, 2019), as well as for implementing in-house scenario analyses on various topics, such as the one presented here.

Aglink-Cosimo is driven by trends, elasticities, and the translation of economic logic, agricultural-market expertise, and expectations into equations and projections. It covers 90+ agricultural commodities and 40 world market clearing prices. The current version simulates detailed supply and demand elements until 2030. It consists of over 35 000 behavioural equations, linear or linearised, 'calibratable' and identities, that solve as a problem of nonlinear programming with discontinuous derivatives (DNLP). Markets for agricultural commodities are competitive and typically clear on prices both at the global level, where net trade is zero, and the domestic level, where supply equals demand (Eq. 1):

Dom. producer price, subject to: $$QP_{r,c,t} - QC_{r,c,t} + IM_{r,c,t} - EX_{r,c,t} + ST_{r,c,t-1} - ST_{r,c,t} = 0 \quad (1)$$

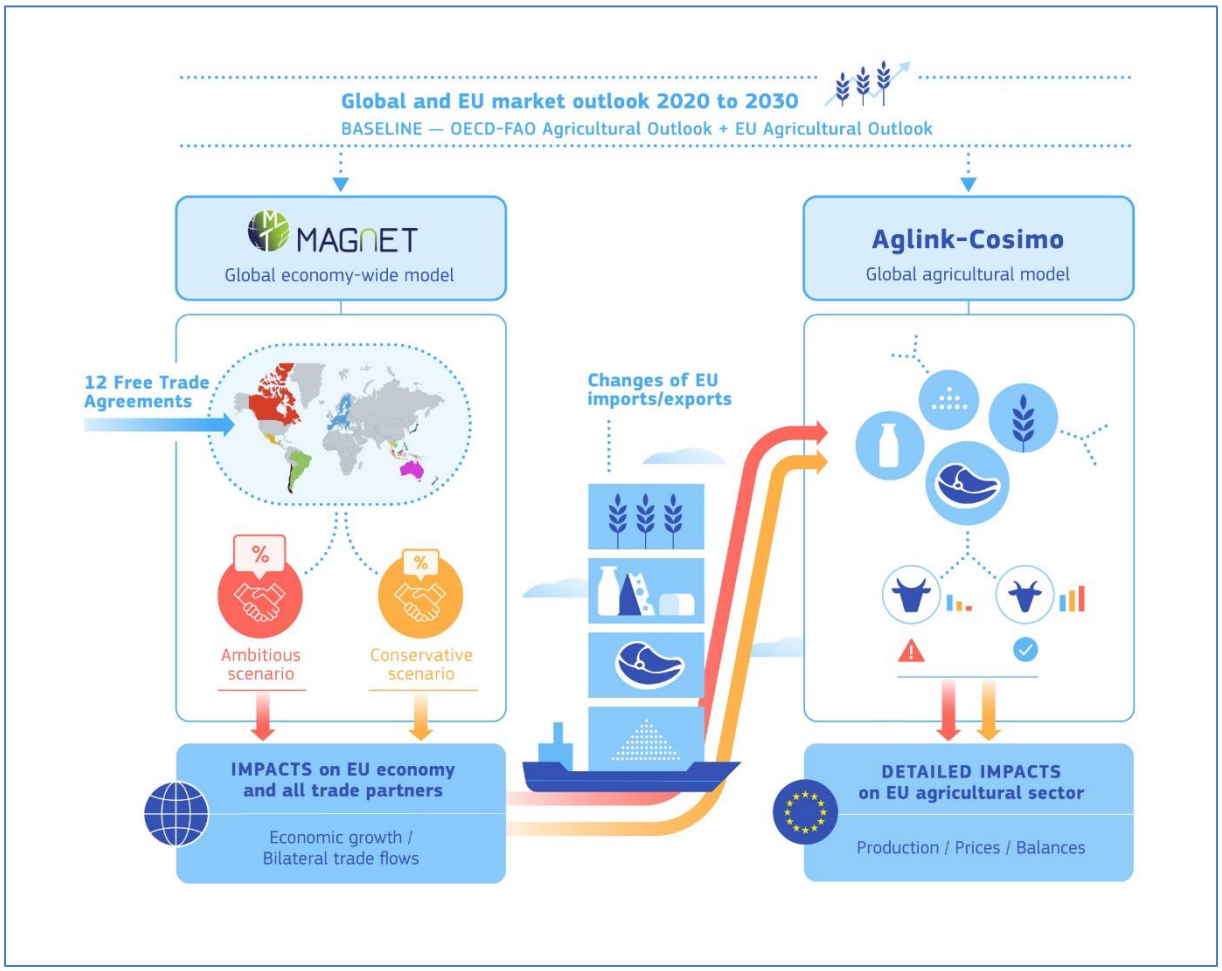
where QP is production; QC is consumption (food, feed, biofuel, and other uses); IM is total imports; EX is total exports; ST is ending stocks; and *r, c, t* are region, commodity, and year identifiers respectively. The model accounts for detailed linkages between different agricultural commodities such as crops, livestock, meat, dairies, biofuels, and sugar. Commodities are modelled as homogeneous goods (i.e., perfect substitution is assumed). Imports and exports are determined separately, and price transmission is indirect through conversion of world prices into market-specific import and export prices. Domestic markets trade with the 'rest of the world' as a whole, not bilaterally. Oil prices and macroeconomic factors, such as GDP growth, inflation, exchange rates, energy prices, and population enter the system exogenously and so remain unchanged in this study. Details on the European Commission's version of the model can be found in Araujo-Enciso et al., (2015) as well as accessed on MIDAS.

2.5 Model linkage

To explore the potential impact of multiple trade agreements on EU agricultural markets, the two models were combined to capture the complexity of analysing multiple trade agreements simultaneously and the details needed to explore the impacts on the EU agricultural sector.

The models are 'soft-linked', and simulations were run in a sequential chain to ensure meaningful exchange of results (Figure 2). First, the Aglink-Cosimo model was used to filter out the potential impact of the not-yet-in-force FTA between Canada and the EU (CETA) from the EU Medium-Term Agricultural Outlook published in 2019 (European Commission, 2019). This led to a set of recalibrated baseline projections (2020-2030) that served as the starting point for the implementation of scenarios with either model. Next, MAGNET was calibrated to the adjusted EU baseline. This step ensured that EU trade values and export/import prices in MAGNET were aligned and co-moving with their Aglink-Cosimo counterparts (i.e., trade volumes and different export/import prices). The MAGNET model's capability to represent all bilateral trade flows in a comprehensive manner was employed to simulate all selected bilateral trade agreements and calculate a new set of bilateral trade flows by reducing bilateral tariffs and TRQs exogenously. MAGNET calculated the cumulative changes on EU real exports and imports (in volumes and values). The latter were then implemented as relative shocks on EU export and import volumes for particular commodities in Aglink-Cosimo, which being a net trade model would not be able to account for bilateral trade shocks directly. Finally, results from the two models were jointly analysed.

Figure 2: Overview of model linkage



Source: Authors' elaboration

The two models have different sectoral aggregations. Although Aglink-Cosimo provides more details on agricultural commodities, it does not include fruits and vegetables, beverages, and other important processed

high-value agricultural products. Hence, results on these sectors are based entirely on MAGNET. The mapping of MAGNET sectors into Aglink-Cosimo sectors is presented in Table 1.

Table 1: MAGNET and Aglink-Cosimo sectors' mapping

MAGNET	Aglink-Cosimo
Wheat	Soft wheat
	Durum wheat
Grains	Barley
	Maize
	Oats
	Rye
	Other cereals
Paddy rice	Rice
Processed rice	
Oilseeds	Soybean
	Rapeseed
Oils and meals	Rapeseed meal
	Soybean meal
	Sunflower meal
	Rapeseed oil
	Sunflower oil
	Palm oil
Sugar beet	Not modelled at trade level
Sugar	White sugar
	Raw sugar
Fruits and vegetables	Not modelled
Other crops (*)	Not modelled
Live animals (cattle)	Cattle
Live animals (sheep, goat, etc.)	Sheep
Beef	Beef and Veal
Sheep (and other red) meat	Sheep and goat meat
Live pigs and other animal products (**)	Swine
Live animals (chicken)	Poultry
Pork	Pig meat
Poultry	Poultry meat
Raw milk	Not modelled at trade level
Dairy	Butter
	Cheese
	Skimmed milk powder
	Whole milk powder
	Wye powder
Other food	Not modelled
Beverages	Not modelled

(*) Fibres crops; wool; spices; forage products; flowers among others.

(**) Live swine; other live animals; eggs; reproductive materials of animals; natural honey; snails; edible products of animal origin not else calssified.; hides, skins and furskins, raw; insect waxes and spermaceti.

Source: Authors' elaboration.

2.6 Caveats of the approach

2.6.1 General caveats of all modelling exercises

Economic models provide a conceptual framework that allows the economy to be represented in a structured but schematic and simplified manner. By definition, they cannot reproduce the reality in its full complexity and thus have shortcomings and limitations which affect the results of the studies based on such models.

The two models employed are designed as tools for conducting policy experiments in which a reference scenario or baseline is first simulated over a future period and then, after changing one or more underlying assumptions (e.g., policy settings, exogenous macroeconomic developments or, weather trends), a new scenario incorporating these changes is run over the same time period.

A comparison of the new scenario with the baseline scenario at a given point in the simulation period, usually in terms of percentage differences, establishes the direction and relative magnitude of the impacts on all the endogenous variables of the change that is depicted in the hypothetical scenario at that point in time. In other words, these models are intended to allow comparisons for the same moment in time (i.e., holding time constant) between the outcomes prevailing in two or more different hypothetical 'states of the world' that might prevail at that point in time. In this study, the year of interest is 2030, and the alternative states of the world correspond to different, hypothetical rules for bilateral trade between the EU and third countries.

Although these models can be used to project individual values of particular variables, it must be stressed that they are not forecasting models and users should be aware that the projections for, say, 2030 may be unreliable as to what will happen in that year. However, the simulated impact of a particular policy change in 2030, relative to the 'no change' situation, is more likely to be reliable since the influences of any imperfections in the model and of unforeseen exogenous shocks may be cancelled out across the two scenarios being compared, leaving a deviation between the two that has a lower component of error.

CGE and PE model solutions become less reliable the further into the future outcomes are simulated. Given the very large number of assumptions, estimated or calibrated parameters, and stylised specification features that these models assemble, each of which is 'correct' only up to an (unknown) probability, it is difficult to establish confidence intervals or margins of error around individual projected numbers.

2.6.2 Market access and tariff aggregation

This study focuses on market access through cuts in import tariffs and TRQ concessions and does not take into account NTMs or further regulatory issues included in comprehensive FTAs (Box 3).

A further caveat deals with the aggregation at which tariffs are modelled. MAGNET specifies product categories at an aggregation (usually 6-digit level or higher) that is higher than that used for designating tariff cuts (i.e., 8-digit tariff lines). This means that MAGNET works with 'aggregated tariffs' for aggregate commodities. This tariff is calculated by using the trade weighted average of the tariffs for e.g., 8-digit tariff lines belonging to each 6-digit group. The 'aggregated tariff' is then subjected to the respective cut (depending on which tariff band the aggregated tariff falls into). This implies that the cut is too high for some 8-digit tariff lines and too low for the others. For example, in the pork sector, the EU *ad valorem* equivalent (AVE) for 8-digit tariff lines ranges from 11.5% to 65.5% (ignoring zero tariff lines); therefore, the aggregate tariff of the 6-digit product group lies somewhere within this range. It follows that the tariff cut applied to the aggregated tariff is too high for some 8-digit tariff lines and too low for the others. Thus, it is impossible to check if the effect is systematically overestimated or underestimated since it depends on the country's specific current bound tariff lines (at 8-digit level) and the number of those lines within each HS6 tariff line.

For the treatment of tariffs under a TRQ regime, the MAcMap-HS6 methodology (Guimbard et al., 2012) was followed. The level of protection is equal to the in-quota tariff rate if the quota is not binding or to the out-of-quota tariff rate if the quota is binding. Fill rates are used to assess whether the quota is binding or not. When the fill rate is below 90% the applied tariff is the in-quota one, when the fill rate is higher than 98% the out-of-quota is the applied tariff, while when the fill rate is between 90 and 98% a simple average between the in-quota and out-of-quota tariff rate is calculated and applied.

It is important to stress that to calculate applied tariffs the model employed the 2014 trade situation. When relevant, some tariffs (e.g., EU import tariffs for wheat that are currently at zero contrary to the situation in 2014) have therefore been adjusted following expert knowledge.

2.6.3 Specific caveats of this analysis

One of the main limitations relates to the coverage and the disaggregation of the agricultural products in the models used: the CGE model MAGNET has a comprehensive coverage of the economy, and thus of the agri-food sector and beyond. However, as explained in Section 2.3, the product disaggregation is limited, as well as its capacity to model detailed sectorial linkages and policy constraints.

On the other hand, the PE model Aglink-Cosimo, which is used to overcome these shortcomings of the CGE models, provides much more detailed and realistic results at the agricultural commodity level, although it cannot provide results for specific dynamics relating to certain product segments (e.g., specialty cheeses vs. industrial cheeses). However, the **product coverage** of the Aglink-Cosimo model is lower than that of the CGE models: although it includes all major agricultural commodities, it does not model some important agricultural products such as fruits and vegetables, wine, olive oil, and processed agricultural products in general. Given the very high value of processed products, the Aglink-Cosimo model does not represent a significant share of EU agri-food export value.

As regards the **geographical disaggregation of the study**, results are provided only for the EU as a whole. This means that this exercise is not able to provide indications on the impact of trade agreements at Member State or at regional level, which are explicitly covered in the standard Commission SIAs.

Another limitation of the study lies in the **theoretical character of part of the scenarios**, where, for the negotiations not yet concluded, possible trade concessions for sensitive products are not implemented as of TRQs – as is usually the case in trade negotiations - but rather in terms of partial tariff liberalisation (the exception being represented by the already concluded FTAs).

In addition, trade scenarios were designed as if all agreements would enter into force at the same time and be completely enforced by the end of the simulation period (2030). As this is not the case (some of them are already in force, some are to be ratified and others are still in the negotiation phase), the simulation fails to show possible path dependency effects of the different time at which each FTA will be ratified and will be definitively enforced. The results of the model exercises show the final equilibrium state after all FTAs are enforced and all shocks have been absorbed by the economic system. In reality, this final equilibrium might be re-established in a longer period than the 10 years simulated by MAGNET and Aglink-Cosimo.

Furthermore, the considered trade scenarios only investigate the effects of tariff liberalisation, but do not factor the possible reduction of **NTMs** in the analysis. In fact, since there are currently no reliable estimates of NTMs for the agricultural sector at disaggregated level, and given the limited time to complete the exercise, it was decided to omit them from the study. The non-quantification of gains ahead in the NTMs area may hide important benefits for the EU exporters, as several trading partners impose cumbersome and unjustified procedures that are usually addressed in an FTA. On the other hand, regarding the EU imports, past experience shows that the EU does not compromise its standards of consumer protection in any FTA chapter, for example on authorising so-called growth promoters in the production of imported products, or modifying its science-based genetically modified organism (GMO) approval process. These barriers to EU imports stay in place, even when tariffs are removed or reduced.

Finally, the EU's new growth strategy, the Green Deal, which sees trade policy as a supporter of its ecological transition, is not included in this analysis ([5]).

([5]) Commitments to sustainability have been continuously strengthened in EU trade agreements, in particular with regard to enhancing climate change action (European Green Deal, p. 21) https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1576150542719&uri=COM%3A2019%3A640%3AFIN.

Box 3: Non-tariff measures

NTMs are policy measures other than ordinary customs tariffs that can have an effect on trade. NTMs are classified according to their scope and/or design and include a wide range of instruments such as sanitary and phytosanitary) measures, technical barriers to trade, pre-shipment inspection and other formalities, contingent trade-protective measures, intellectual property rights, rule of origin, etc. (UNCTAD, 2015). By contrast to transparent and measurable tariffs, there is no common agreement on the aim, collection, quantification and modelling of NTMs. Agri-food sectors are among those which undergo many different NTMs. Among them meat, dairy, fruits and vegetables (and cereals to a lower extent) are the commodities where the highest number of NTMs can be found.

With the scarcity of global and consistent cross-country databases on NTMs, quantifying NTMs and NTMs reduction is not trivial. Prior to their integration within a CGE framework, NTMs are usually converted into AVE tariff rates that would have a similar trade-restricting effect as the NTMs. Gravity models are commonly used to calculate AVEs, but the model design (functional forms, price gap/quantity gap approaches, etc.) has a significant impact on estimation results and gravity equations have obvious drawbacks (Beghin et al., 2015). Furthermore, an aggregation problem of NTMs results from establishing the right match between product-based NTMs and economic sectors of the CGE models. Finally, the literature is not conclusive on the correct representation of NTMs within a CGE framework, and provides several options including the representation of NTMs as efficiency loss/gain, as rent for domestic/foreign producers, as additional trade cost, etc. Sanjuán et al., (2019) review the recent literature to identify and discuss the approaches to depicting NTMs in simulation models.

Importantly, liberalising trade does not mean eliminating all NTMs. Many NTMs in agri-food sectors are not designed as a barrier to trade but rather for public policy purposes, such as maximum residue levels and contamination and/or production standards in order to ensure safety and quality characteristic along the entire food supply chain or to address market failures (e.g., asymmetry of information between producers and consumers, externalities) or to enhance consumer demand for goods by increasing quality attributes (e.g., production process requirements or standards). Eliminating those NTMs is not the objective of any trade negotiation. Therefore, quantifying the size of the reduction in NTMs due to trade agreements remains difficult. For instance, in Bureau et al (2014) NTMs were set to be cut between 15% and 30% in the context of a possible Transatlantic Trade and Investment Partnership agreement, while in Francois et al., (2013) they were supposed to be reduced by 10–25 %.

Finally, non-members of a trade agreement (third countries) can also benefit from any NTM harmonisation (reduction) if it decreases the cost associated to export to the markets of the two parties of the agreement. Quantifying this secondary (spill-over) effect is difficult, and often neglected, although further bilateral AVEs in the CGE models should be assessed and reduced for respective third country exporters.

For the above reasons NTMs are not modelled explicitly and no assumptions are made on possible NTMs' quantification, modelling and reduction due to the FTAs. The trade restrictive impact of NTMs is implicitly considered in the underlying trade database of MAGNET to the extent that it concerns the current (observed) pattern of international trade. Therefore, and overall, the modelling results underestimate potential effects of the current EU FTA agenda from a NTM perspective. OECD (2016) does not model NTMs either when considering effects of possible multilateral trade reforms, acknowledging they can influence trading patterns and therefore production and prices. There is still room for research improvement in this domain.

3 Trade policy scenarios

Among the 12 FTAs covered by this study, negotiations are concluded for the agreements with Canada, Japan, Mercosur, Mexico and Vietnam, and the details of the negotiations are thus known. As regards the other agreements under negotiation or possibly envisaged, the actual outcome is still unknown. This is particularly true for the identification and the treatment of sensitive products, for which reciprocal concessions are usually granted under the form of TRQs. It would thus be extremely challenging to speculate about the number of tariff lines to be fully liberalised as well as about the possible realistic volumes of reciprocal TRQ concessions. Given the large degree of uncertainty about most open trade talks under the EU bilateral trade agenda, it is not possible to model in the study a precise negotiation outcome. Instead, it is preferable to consider theoretical scenarios that can provide a range for possible cumulated impacts of the EU trade policy. The study considers for the not-concluded agreements two alternative trade scenarios defined by two levels of ambition in the negotiations: a conservative and an ambitious scenario.

3.1 Definition of the scenarios

For the trade agreements with Canada, Japan, Vietnam, Mercosur, and Mexico and Vietnam, the final outcomes of the negotiations, as regards tariff liberalisation, haves been included in both the conservative and the ambitious scenarios. This includes the modelling of reciprocal bilateral TRQs granted under these agreements for relevant products. Bilateral TRQs are explicitly implemented for EU imports of beef, pork, poultry, dairy and rice from Mercosur, imports of rice from Vietnam, EU exports of milk to Canada and EU exports of dairy, pork, and poultry to Mexico.

For the remaining seven trade negotiations, the two scenarios are based on a full tariff liberalisation for a large majority of tariff lines and on a partial tariff cut for the few remaining lines, which represent the sensitive products. The conservative and the ambitious scenarios differ in terms of the assumptions as regards the percentage of tariff lines that will be fully liberalised under the agreements and the size of the tariff cut for the sensitive products.

3.1.1 Conservative scenario

Besides the implementation of the agreements with Canada, Japan, Mercosur, Mexico, and Vietnam according to the actual negotiation outcome, the conservative scenario (CONS) for the other seven FTAs is defined as follows:

- full tariff liberalisation for 97% of HS 6-digit lines;
- partial tariff cut of 25% for the remaining 3% of lines (sensitive products).

These assumptions are applied identically for all considered trade agreements and symmetrically for the EU and the relevant trading partners.

The percentage of liberalised lines must be dealt with at HS6 rather than at a lower level (i.e., 8-digit level for the EU), since all global trade models work with HS6, which is the most disaggregated level for the harmonised world trade nomenclature. The margin of manoeuvre to shield agricultural sensitive products is not identical when working at HS6 or at a more detailed level, since the share of agricultural lines on the total tariff lines is different in the two product nomenclatures. A 97 % liberalisation at HS6 level leaves room for up to 21 % of potentially sensitive agricultural codes to be excluded from full liberalisation and is thus roughly equivalent to 95.4 % liberalisation at 8-digit level for the EU.

3.1.2 Ambitious scenario

The ambitious scenario (AMBI) is defined based on the same structure of the conservative one, but with the following key parameters:

- full tariff liberalisation for 98.5% of HS 6-digit lines;
- partial tariff cut of 50% for the remaining 1.5% of lines (sensitive products).

These assumptions are applied identically for all considered trade agreements and symmetrically for the EU and the relevant trading partners.

98.5% liberalisation at HS6 level leaves room for up to 10.5% of potentially sensitive agricultural codes to be excluded from full liberalisation and thus roughly corresponds to 97.7% liberalisation at 8-digit level for the EU.

3.2 Treatment of sensitive products

For the seven considered trade agreements whose negotiations are not concluded yet, trade scenarios described under the previous subsection provide for a number of sensitive tariff lines exempted from full tariff liberalisation, and for which a partial tariff cut is applied instead. The number of sensitive tariff lines and the magnitude of the partial tariff cut differ between the conservative and the ambitious scenarios, but these two parameters are applied consistently within the same scenario, for any of the seven trade agreements, both for the EU and third countries. However, the list of sensitive products exempted from full tariff cut varies in function of the agreement considered and can of course be different for the EU and for the relevant trading partners.

Sensitive products do not necessarily have to be agricultural or agri-food products, but can refer, in theory, to any line of the HS6 nomenclature, notably industrial goods. However, for most of the trade agreements covered by the study, agricultural lines represent the bulk of sensitive products.

The list of sensitive products for each agreement and trading partner has been established based on two criteria applying in the following priority order:

- expert judgement based on the evidence of ongoing negotiations with trading partners or on the analysis of the respective sensitivities carried out prior to the launch of the trade talks;
- objective statistical indicators, notably the tariff revenue associated to each tariff line (Box 4:).

The list of sensitive products on the EU side is dominated by agricultural and agri-food products. The most recurrent categories of EU sensitive products are the following: cattle meat, other meat, rice, wheat, other cereals, sugar, and dairy products. In addition, for some negotiations, some individual tariff lines within a broader product category were selected, e.g., garlic, sweet maize within the fruits and vegetables category, ethanol (beverages and tobacco products), olive oil (vegetable oils), eggs (other animal products) starches, canned mushrooms, some preserved fruits, processed tomatoes, fruit juices and, some sugar confectionary (other food).

However, not all these products can be selected in all negotiations given the constraints in terms of the maximum number of sensitive products. Of course, this constraint is more stringent in the case of the ambitious scenario.

As far as EU trading partners are concerned, beyond well-known sensitivities having emerged from trade negotiations or preliminary talks, the degree of knowledge about products potentially eligible for exemption from full tariff cut is somewhat more limited; therefore, the use of statistical indicators for the compilation of the sensitive products' list is more extensive in the case of third countries than for the EU.

Box 4: Selection of sensitive products

In trade agreements, the negotiating parties declare some products as sensitive and make them subject to specific treatment: reduced (smaller) tariff cuts, TRQs or exclusion. Even if the number of sensitive products is small, they likely have a significant impact on the economic outcome of most trade deals and can also dramatically reduce the cuts in average agricultural tariffs (Jean et al., 2010). Therefore, the sensitive products for the FTAs covered in this paper have been selected carefully. A large share of sensitive products has been selected by trade experts, reflecting the typical negotiating positions (offensive or defensive) of the FTA partners. For the remaining cases (or if experts only identified broader sectors as potentially sensitive), the list of sensitive products has been completed by an automatic selection procedure.

The automatic selection procedure for sensitive products is based on the political economy model of (Grossman and Helpman, 1994) where the selection of sensitive products is assumed to be optimal in terms of maximising a government objective function. Under specific assumptions, the government's optimisation problem can be well approximated with a tariff revenue loss criterion. This simplified approach greatly reduces the computational burden (Jean et al., 2005). Tariff lines are ordered based on the expected tariff revenue losses due to trade liberalisation, without factoring in the potential adjustments in traded quantities after the trade deals (i.e., calculating tariff revenue losses for current trade patterns). Unlike the multilateral approach of Jean et al., (2005), here the tariff revenue loss criterion was computed in a bilateral context. The algorithm calculated expected tariff revenue losses for all bilateral trade flows between, for all FTA partners, and for all FTAs considered.

Expected tariff revenue loss is calculated based on AVE tariffs for 2014, as reported in the International Trade Centre (ITC) ITC-MacMap database (Guimbard et al., 2012). Traded values and quantities were taken from BACI-COMTRADE (Gaulier and Zignano, 2010; average of years 2016–2018). Tariffs, trade statistics and tariff cuts were all taken into consideration at the 6-digit level of the HS classification. In our ex-ante scenarios, sensitive tariff lines are subject to partial tariff cuts only (25% cut in the conservative scenario and 50% cut in the ambitious, compared to current levels). Tariff cuts are effective always on the applied rates. The number of sensitive tariff lines is smaller in the ambitious scenario (1.5% of all lines) than in the conservative one (3% of the lines).

There are good reasons why the tariff revenue loss criterion is not always suitable for selecting sensitive products, but should only complement a first selection of sensitive tariff lines by market experts. In particular, the following issues cannot be taken into account adequately by the tariff revenue loss criterion.

The endogeneity problem can generate a serious flaw in the algorithmic selection of sensitive products. High tariff rates on highly protected tariff lines might lead to small imported quantities and thus small expected tariff revenue losses. Therefore, highly protected tariff lines with small import flows would not be picked by our selection algorithm, despite them clearly being politically sensitive in trade negotiations.

In addition, the entry price system of the EU is modelled with some simplifications. The entry price system sets minimum entry prices of certain products, by putting an optional specific tariff on imports. The size of the specific tariff depends on the import price relative to pre-defined entry prices. Therefore, the EU entry price system might add a specific tariff component on top of the AVE tariffs. In case a trade deal would keep the entry price system operational, tariff cuts would only be effective on the AVE component. The specific tariff component would be excluded from the tariff cuts. The database we used for the tariff revenue calculations did not allow such exceptions to be taken into account, because the AVEs of the database are already a combination of the AVE and the specific components. Therefore, our approach of cutting the combined tariff might overestimate the achieved tariff cuts in the FTA.

Overall, the selection algorithm selected 32% of the total sensitive tariff lines in the ambitious scenario, and 48% of them in the conservative one.

3.3 Implementation of scenarios

The scenarios were implemented in MAGNET following a time step approach. The model ran over two-time steps from the base year (2014) to 2020 then from 2020 to 2030.

All the tariff cuts and TRQs associated with the negotiations that are already concluded and the tariff cuts associated with the remaining seven FTAs are assumed to enter into force in 2020 and show their impacts on the global economy by 2030.

The tariff shocks were implemented via the Tariff Analytical and Simulation Tool for Economists (TASTE) program (Horridge and Laborde, 2008). This program reads the MAcMapHS6 database and transforms scenarios about formula-based changes into files of percent change shocks to the applied rate. All the calculations take place at the HS6 level and are then aggregated to the appropriate model level. In this report, all tariff shocks were implemented as linear cut of the applied tariff.

The trade weighted tariffs faced by EU exporters and trade weighted EU import tariffs for all partners are presented in Table 2 while Table 3 shows import and export tariffs for the 12 FTA partner countries. The export columns in the table are calculated by multiplying the tariff rate imposed on EU exports by each country with their share in EU exports for that commodity, and then summing over all countries. The import columns are calculated in the same way on the basis of the tariff rate imposed by the EU on each country and the countries' import shares. The trade weighted tariff rate faced by some of the EU exports increases under trade liberalisation. This paradoxical effect is due to the effect of the trade-weighted averaging, and notably to the increase in EU exports towards countries with a high level of protection and that cut their tariff under their trade agreement with the EU.

The difference between the scenarios shows the impact of the two simulated scenarios in reducing the tariff barriers to trade by 2030. EU import tariffs for the 12 FTA partners (Table 3) show that when tariffs are already low, as in the case of other cereals, fruits and vegetables, oils and meals, and beverages, the EU liberalisation towards 12 FTA partners is almost complete. Most of the sensitive products are then selected among sectors such as rice, sugar, and the different meat sectors, which have higher initial tariffs. On the export side the pattern is similar (Table 3), where tariffs where already low, under the two scenarios sectors become almost completely liberalised (oilseeds, sheep meat, fruits and vegetables). Partner countries consider cereals, poultry, and dairy as sensitive commodities.

Table 2: Tariffs faced by EU exports and EU import tariffs, all partners (2030, %)

	Exports			Imports		
	Baseline	**Conservative**	**Ambitious**	**Baseline**	**Conservative**	**Ambitious**
Wheat	12.39	12.04	12.04	0.00	0.00	0.00
Other cereals	5.95	5.93	5.93	0.31	0.18	0.17
Fruits and vegetables	4.25	3.96	3.96	3.59	3.03	2.95
Oilseeds	2.63	2.60	2.60	0.00	0.00	0.00
Other crops	3.27	3.04	2.95	0.18	0.14	0.13
Beef	5.97	5.44	5.17	25.61	27.69	26.78
Poultry	6.60	5.96	5.77	10.79	8.27	7.34
Sheep meat	6.82	6.54	6.54	1.20	1.24	1.18
Pork	7.52	6.20	5.82	2.14	1.76	1.46
Oils and meals	7.96	7.36	7.36	3.80	1.90	1.32
Dairy	8.25	7.14	7.04	2.66	2.93	3.20
Processed rice	2.38	1.83	1.84	9.64	8.35	7.42
Sugar	7.11	6.92	6.91	19.93	16.81	16.69
Other food	6.95	6.03	5.97	4.58	2.70	2.28
Bev and tobacco	12.59	11.65	11.43	2.65	1.69	1.58

Source: Authors' calculation from MAGNET results.

Table 3: Tariffs faced by EU exports and EU import tariffs, 12 FTA partners (2030, %)

	Exports			Imports		
	Baseline	**Conservative**	**Ambitious**	**Baseline**	**Conservative**	**Ambitious**
Wheat	8.48	2.76	2.76	0.00	0.00	0.00
Other cereals	7.14	6.78	6.75	0.74	0.07	0.00
Fruits and vegetables	4.68	0.22	0.20	3.81	1.03	0.68
Oilseeds	0.83	0.07	0.07	0.00	0.00	0.00
Other crops	3.55	1.49	0.77	0.17	0.02	0.00
Beef	11.24	3.80	1.71	42.45	40.18	37.92
Poultry	15.65	7.09	5.42	13.66	9.18	7.79
Sheep meat	2.51	0.00	0.00	1.63	1.68	1.57
Pork	6.77	2.64	1.69	17.45	7.19	4.05
Oils and meals	2.86	0.16	0.16	4.04	1.69	1.00
Dairy	12.29	5.74	5.30	44.38	26.99	20.19
Processed rice	6.72	0.31	0.42	15.99	10.97	7.86
Sugar	7.47	2.09	1.94	33.44	16.80	16.37
Other food	8.59	1.85	1.51	9.66	1.73	0.35
Beverages and tobacco	9.85	3.80	2.57	5.33	0.79	0.29

Source: Authors' calculation from MAGNET results

Following the implementation of tariff shocks in MAGNET, simulated bilateral flows involving the EU were inspected and aggregated into total EU imports and exports (in value). Representing cumulative trade effects in 2030, those changes were then exogenously introduced into Aglink-Cosimo as relative shocks on imports and exports (in volume). The model was then run twice – once for each set of trade patterns – to explore the potential impact on EU commodity balances and prices.

Introducing expected trade changes regarding relevant EU agricultural commodities from MAGNET into Aglink-Cosimo essentially causes trade imbalances that displace markets to temporary disequilibria. In our setting, those artificial imbalances stimulate an endogenous (one-round) price reaction that restores market equilibria by adjusting the other supply and demand elements of Eq. (1).

The two models solve recursively-dynamically on different periods (MAGNET: 5–10 years, Aglink-Cosimo: annually, for 10 years). To reconcile the two solution steps, the 2030 impacts of the various FTAs from MAGNET were distributed over the 10-year projection horizon of Aglink-Cosimo with an annual factor increment of 0.1. That is, if MAGNET prescribed an increase of total EU imports by 10% in 2030 for a given commodity, the shock would be implemented progressively on the relevant time series of Aglink-Cosimo (1% in 2021, 2% in 2022, 3% in 2023, etc.) culminating into the full expected change of 10% by 2030. In line with the 2016 version of the simulation experiment, this approach implies a gradual implementation of the modelled FTAs, allows for temporal market adjustments to be brought about, and leads to stable medium-term balances.

4 Baseline towards 2030

4.1 Baseline assumptions and key values

The MAGNET baseline was calibrated to the EU Medium-Term Agricultural Outlook 2019-2030, published by the Directorate-General for Agriculture and Rural Development in December 2019 (European Commission, 2019). The macroeconomic developments (GDP, population growth rate, world crude oil price) were exogenously imposed to the model following the forecasts adopted in the EU Medium-Term Agricultural Outlook (Table 10).

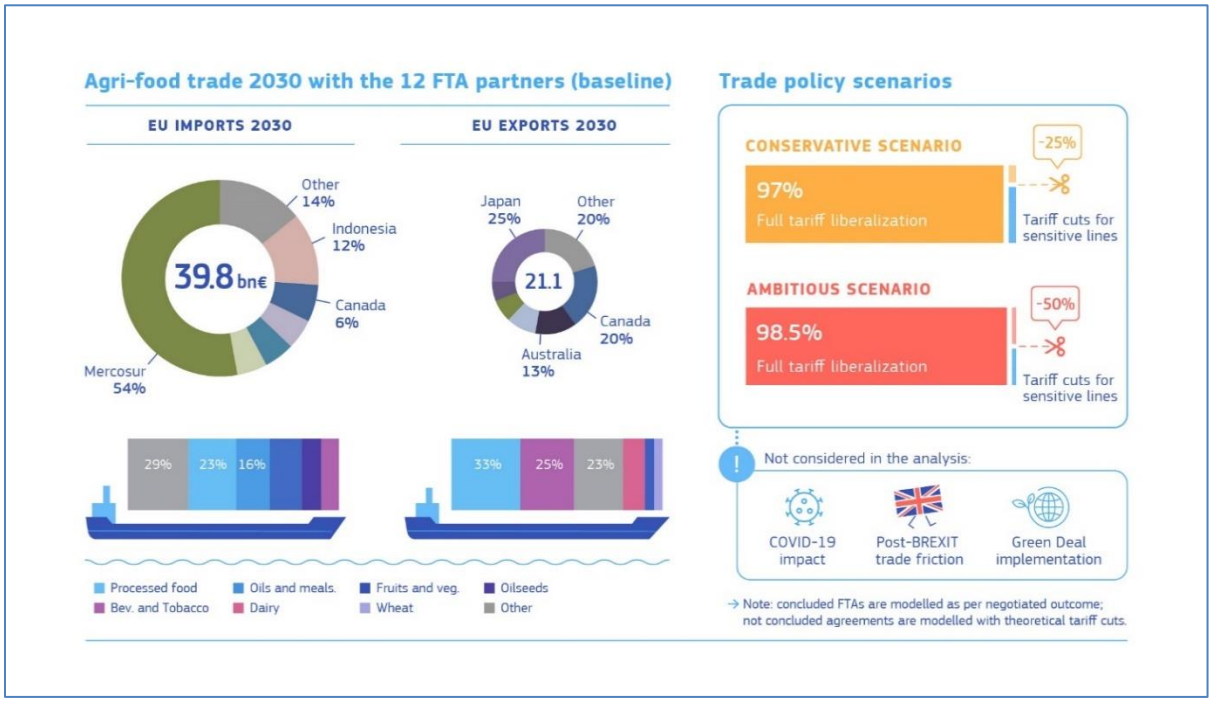
In addition, the model was calibrated around trade statistics to replicate EU bilateral imports and exports for crucial agricultural sectors and trading partners. The baseline also includes the development of existing EU TRQs for beef and poultry. To make sure that the full implementation of the Canada and Japan agreements (which entered into force in 2017 and 2019 respectively) will be part of the scenarios, the impact of these agreements was excluded from current statistics and baseline, based on expert judgment. Other already implemented trade agreements (e.g., with Korea, Switzerland, or Ukraine) are part of the baseline.

In addition, the baseline was modified to include the implementation of the revised memorandum of understanding (MoU) with the United States on the TRQ for imports of high-quality beef, whereby 35 000 tonnes of the quota out of 45 000 tonnes (in product weight) are allocated to the United States after a 7-year phasing-in period. The MoU was revised with the agreement of the other substantial supplying countries (Argentina, Australia, and Uruguay). The revised MoU entered into force in 2020. In effect, it is expected that by 2030 the United States will have increased its exports to the EU by fully benefiting from the increased market access granted by the revised MoU. The other suppliers are expected to partially compensate the market access loss, either by competing with other suppliers in the existing WTO TRQ for frozen beef, or by increasing their out-of-quota exports for the most competitive suppliers.

With regard to the future trade relation between the EU and the United Kingdom, this study assumes DFQF trade between the EU and the United Kingdom, both in the baseline and in the tested scenarios.

The EU Medium-Term Agricultural Outlook reflects agricultural and trade policies currently implemented or already agreed upon (e.g., expiry of sugar production quotas). To replicate the EU Medium-Term Agricultural Outlook trends (production, imports, exports and trade balance) for the different commodities in MAGNET, three parameters need to be adjusted. To calibrate agricultural production changes, a sectorial productivity parameter was endogenized. To replicate the net balance position of the EU by calibrating imports and exports, two preference parameters were modified: a taste change in favour of the consumption of a given commodity in a given region and a technical change parameter augmenting the import of given commodities from given regions in selected regions. Given that the EU Medium-Term Agricultural Outlook only provides EU net-trade positions, the bilateral trade flows of the main commodities in the baseline were adjusted following statistics for 2014 and 2020 and expert knowledge for 2030.

Figure 3: Infographic on agri-food trade 2030 (baseline) and trade policy scenarios



Source: Authors' elaboration

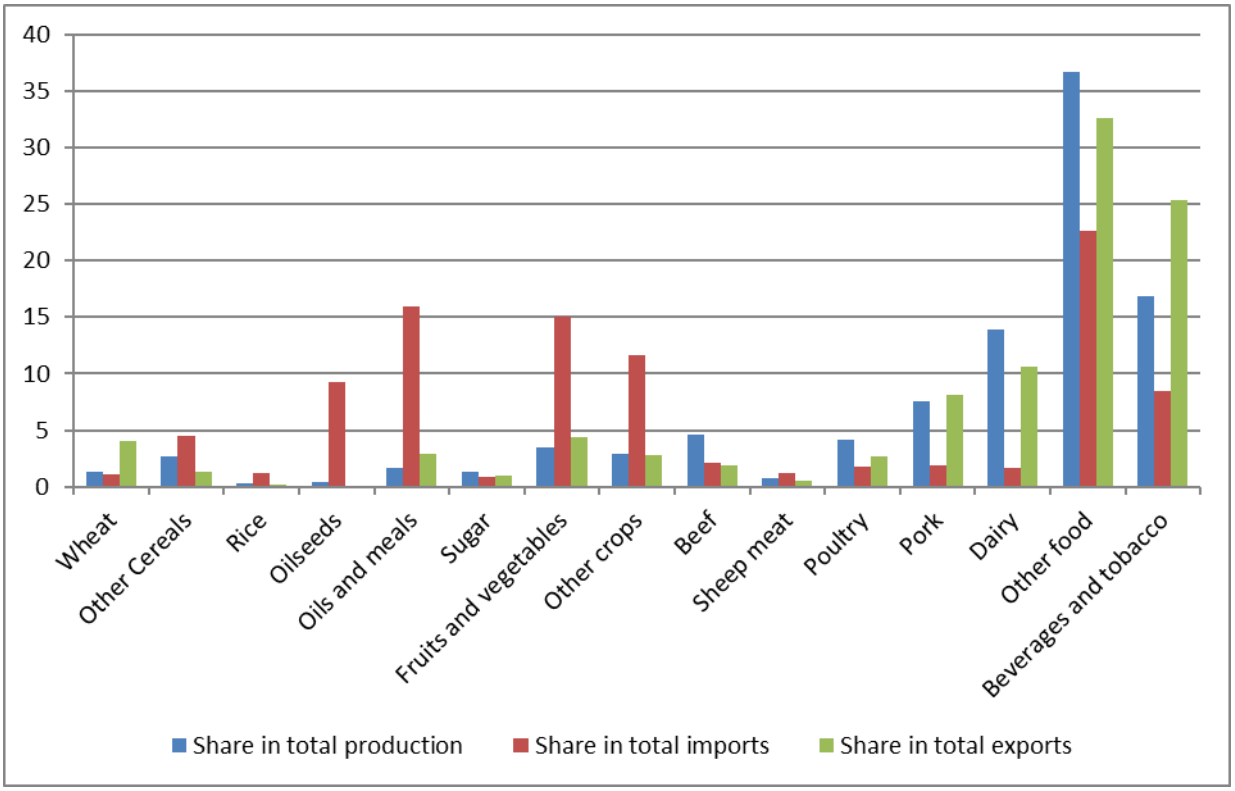
Consistently with the EU Medium-Term Agricultural Outlook 2019-2030, Figure 4 shows the shares in production, imports, and exports by commodities in 2030. These shares represent the weight of each commodity on the sum of the product categories considered in the analysis, as explained in Section 2.3.

These numbers constitute the reference values for the scenarios. Pork, dairy, beverages and tobacco and other food contribute to more than two thirds of the considered agri-food production in value terms. They also represent a large share of the EU exports. Other sectors contributing significantly to the EU agri-food production are fruits and vegetables (3.5%), beef (4.6%) and poultry (4.2%).

The dairy, pork, poultry, and wheat sectors show a significant export orientation, whereas oilseeds, oils and meals, and fruits and vegetables depict high shares of imports (mostly due to the level of imports of tropical fruits in the case of fruits and vegetables).

Compared to 2020, production shares in 2030 remain stable with slight decreases in the meat production and increases in dairy and beverages.

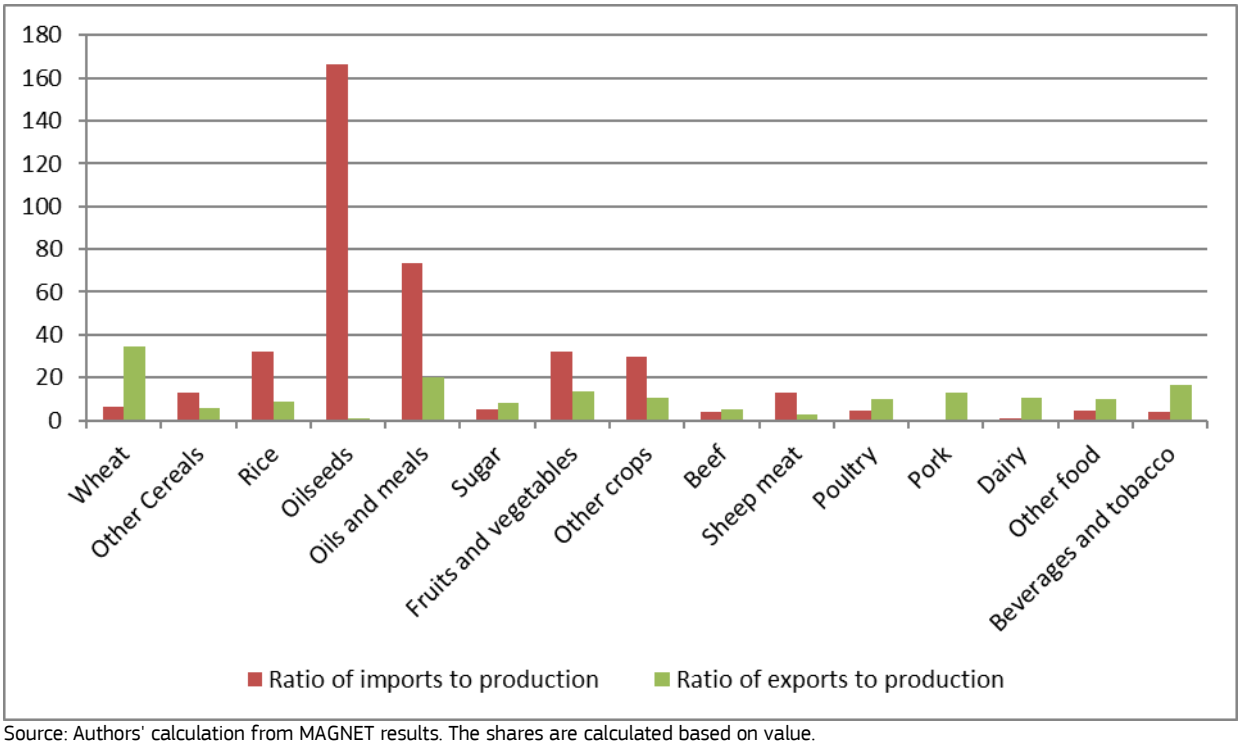
Figure 4: Importance of single commodities on total agri-food categories (2030, %)



Source: Authors' calculation from MAGNET results. The shares are calculated based on value.

The ratios of imports and exports to production for the EU in 2030 are shown in Figure 5. Wheat, pork, dairy, and beverages present a significant positive balance, while a strong import dependency is observed for oilseeds, oils and meals, fruits and vegetables and other crops.

Figure 5: Ratios of imports and exports to production in the EU (2030, %)

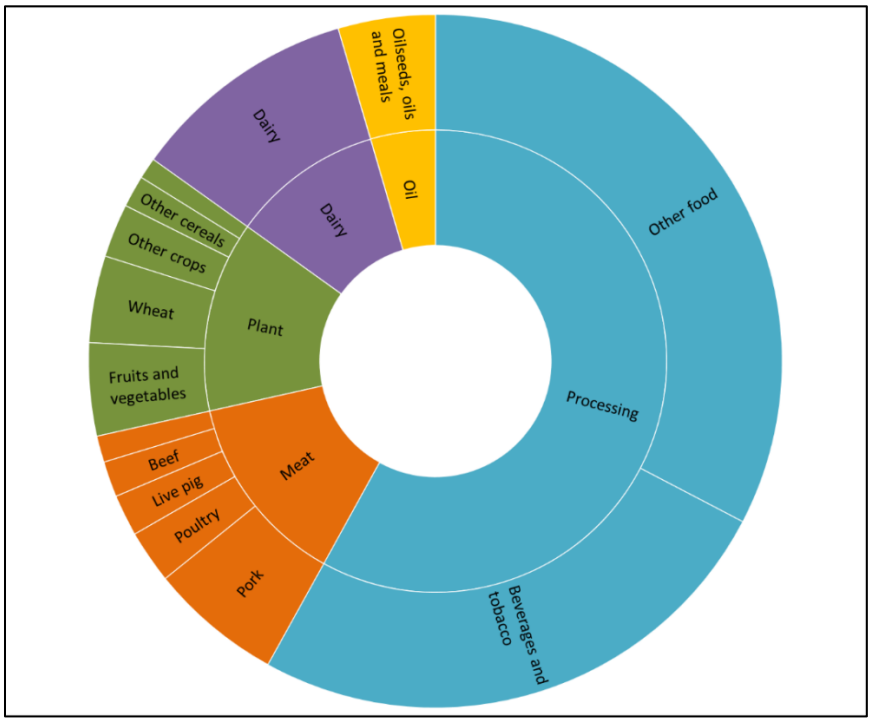


Source: Authors' calculation from MAGNET results. The shares are calculated based on value.

4.2 Main exports and trading partners

The main EU agri-food exports are headed by the other food and beverages and tobacco categories, with a respective share of 32.7% and 25.4% on the sum of all product categories considered in the analysis. Further significant commodities are dairy (10.6%) and pork (6.2%) (Figure 6).

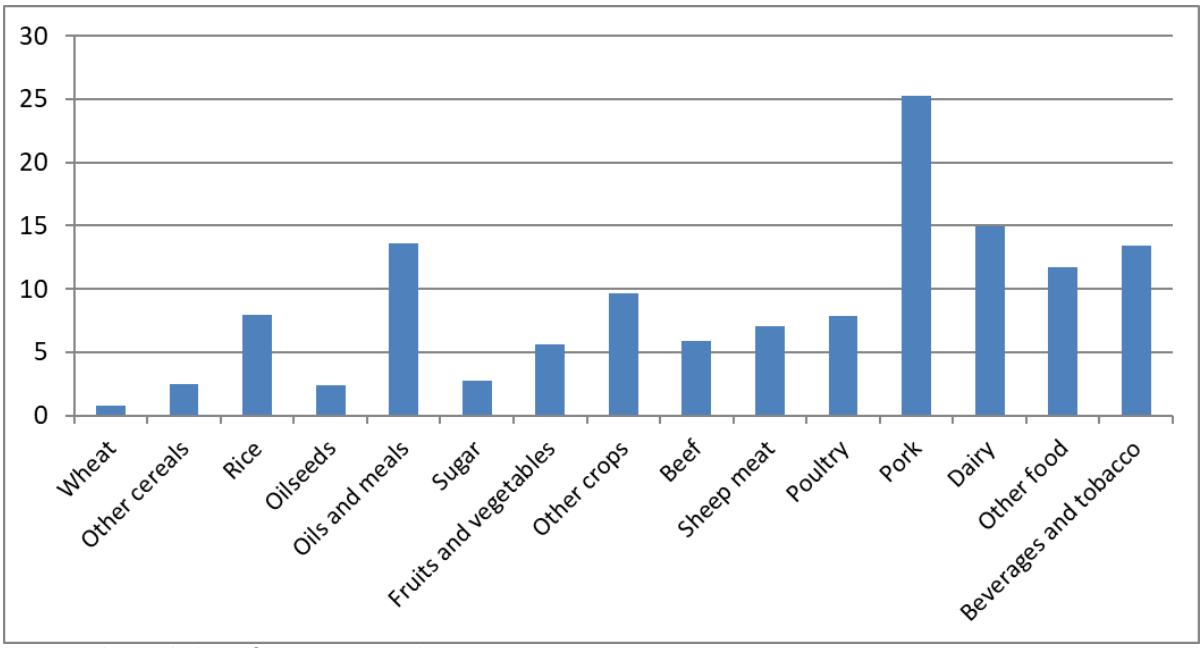
Figure 6: Breakdown of EU agri-food export by sector (2030, %)



Source: Authors' calculation from MAGNET results

More than 25% of EU pork exports are shipped to the 12 FTA partners. This percentage is between 10% and 15% for products in the dairy, beverages and tobacco, other food, and other crops categories. Although wheat and fruits and vegetables have a relatively important share in exports, the 12 FTA partners are not a major destination (Figure 7).

Figure 7: Share of all 12 FTA partners in EU exports by commodities (2030, %)



Source: Authors' calculation from MAGNET results

Japan (25.2%) is the main destination of EU agri-food exports among the 12 FTA partners, followed by Canada (19.8%) and Australia (13.3%).

Table 4: EU exports to the 12 FTA partners (2030, EUR billion, %)

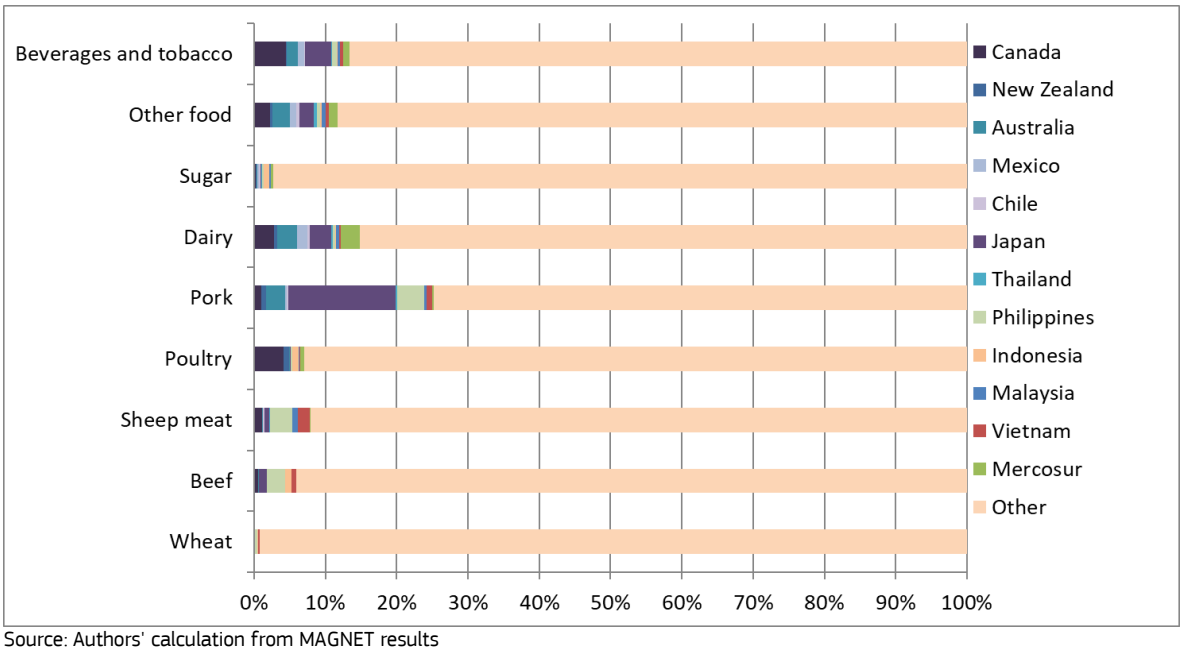
	Base (EUR billion)	Base (%)
Australia	2.80	13.3
Canada	4.16	19.8
Chile	0.44	2.1
Indonesia	0.74	3.5
Japan	5.31	25.2
Malaysia	0.87	4.1
Mercosur	1.47	7.0
Mexico	1.18	5.6
New Zealand	0.52	2.5
Philippines	1.83	8.7
Thailand	0.64	3.0
Vietnam	1.08	5.2
12 FTAs	21.06	100.0

Source: Authors' calculation from MAGNET results

Having only Japan among the top 5 EU agri-food export destinations, and in addition Canada among the top 10 destinations, the 12 FTA partners represent a limited market share for EU agri-food exports and are projected to be the destination of 12.6% of the total exports in 2030 (Table 4). This low percentage is to a

large extent explained by the fact that the United Kingdom, which is by far the largest export market of the EU, is now fully considered as a third country.

Figure 8: Share of EU exports to the 12 FTA partners for main products (baseline in 2030, %)

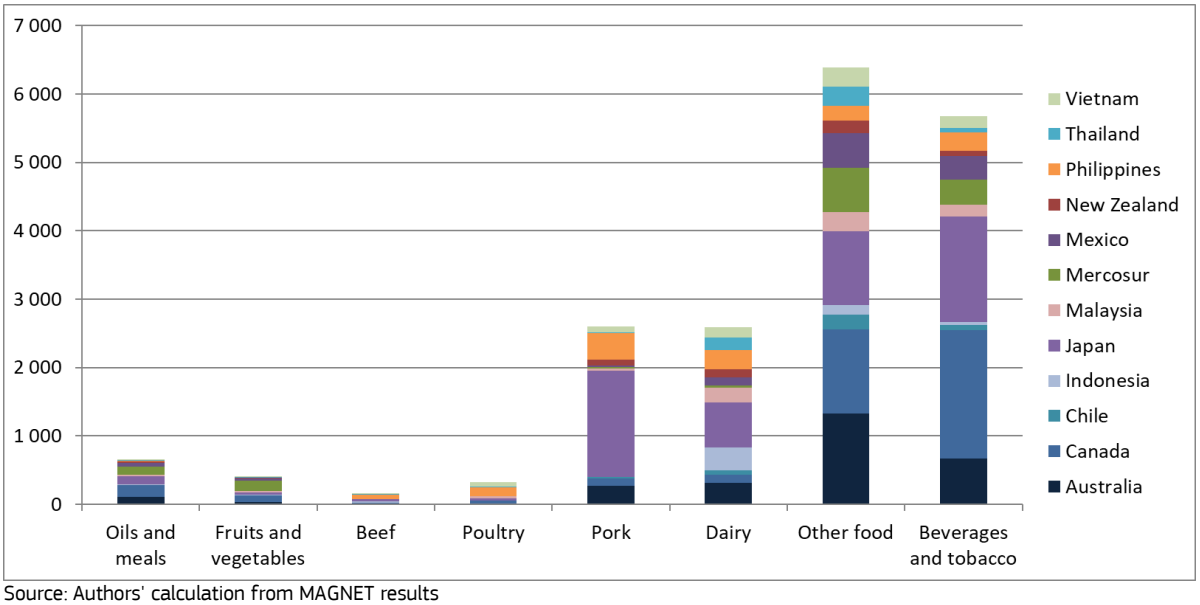


Source: Authors' calculation from MAGNET results

Figure 8 provides more details on the share of the 12 FTA partners for main products, with only pork reaching a share of more than 20%.

Focusing on the key export commodities, among the 12 FTA regions, pork mainly goes to Japan, while the main export destinations for other food and beverages and tobacco are Australia, Canada, and Japan. The importance of the mentioned export commodities in absolute values is visualised in Figure 9. Wheat is mainly exported to North Africa and sub-Saharan Africa, which are not included in the set of the 12 FTA partners. Figure 54 in the annex provides the details on EU export shares for all commodities and products, to all destinations.

Figure 9: EU exports by product and trading partners (2030, EUR million)

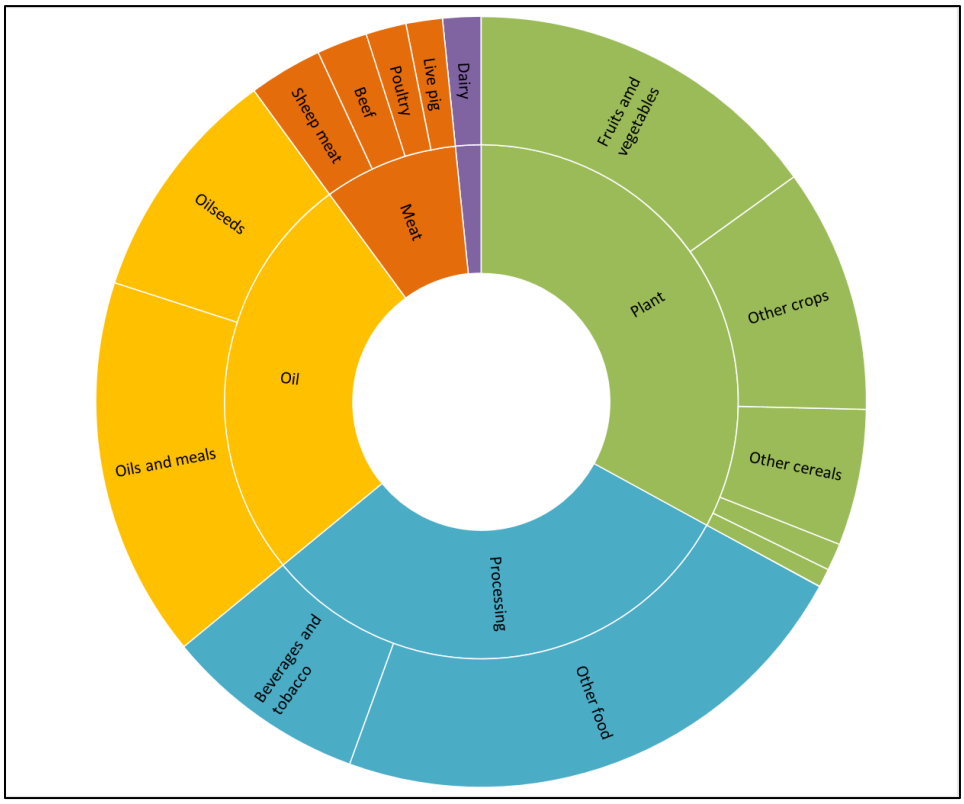


Source: Authors' calculation from MAGNET results

4.3 Main imports and trading partners

Imports are spread mainly among other food, oilseeds and oil and meals, the main import categories which together contribute to about half of the imports. Fruits and vegetables and other crops are other main imported products (Figure 10).

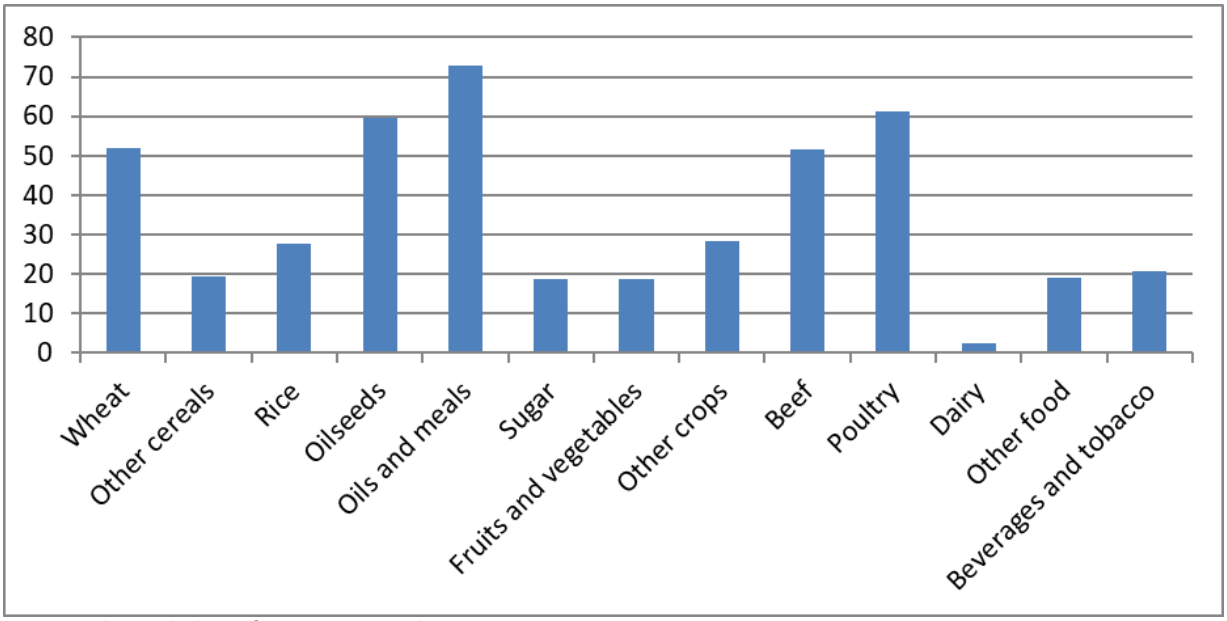
Figure 10: Breakdown of EU agri-food import by sector (2030, %)



Source: Authors' calculation from MAGNET results

For some sectors, the EU imports from the 12 FTA partners represent a high percentage of the EU total imports for this given sector. This is the case for oil seeds and oils and meals (about 60-73%), poultry (61%) and beef (51%). The oil seeds and oils and meals also represent a very high import share compared to the EU production. Other products have also a high share of imports coming from the 12 FTA partners; however not to a similar level (at least with the highly aggregated categories adopted in this modelling exercise) (Figure 11).

Figure 11: Contribution of the 12 FTA partners in total EU imports by commodities (2030, %)



Source: Authors' calculation from MAGNET results

In the baseline, Mercosur contributes to 52.5% of the EU agri-food imports from the 12 FTA partners, followed by Indonesia (12.3%), and Canada (6.1%) (Table 5). As a whole, the 12 FTA partners are projected to supply 34.4% of the total EU agri-food imports in 2030. Again, it is to be noted that the imports from the United Kingdom, which is by far the largest origin of EU imports, are also considered in the total.

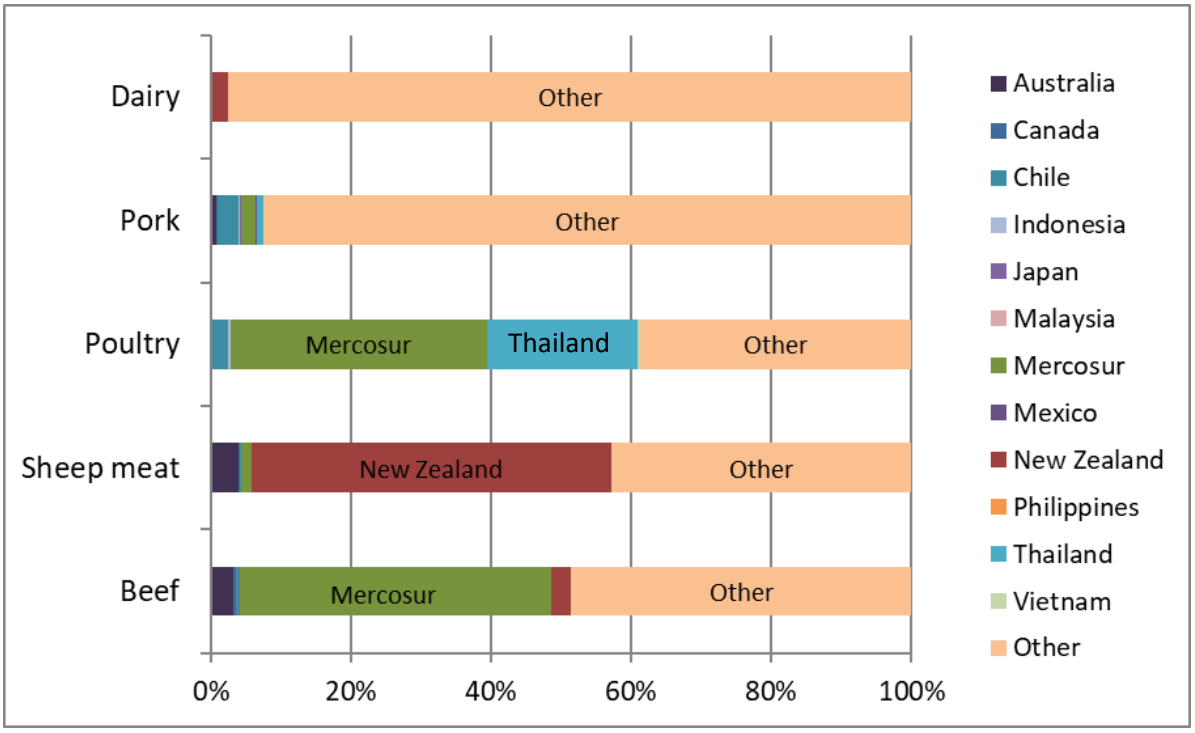
Table 5: EU agri-food imports from the 12 FTA partners (2030, EUR billion, %)

	Base (EUR billion)	Base (%)
Australia	1.18	3.0
Canada	2.38	6.1
Chile	1.91	4.9
Indonesia	4.78	12.3
Japan	0.20	0.5
Malaysia	1.76	4.5
Mercosur	20.39	52.5
Mexico	0.80	2.1
New Zealand	1.25	3.2
Philippines	0.71	1.8
Thailand	1.49	3.8
Vietnam	1.96	5.1
12 FTAs	38.81	100.0

Source: Authors' calculation from MAGNET results

Focusing on meat and dairy sectors only (Figure 12), four partners, namely Australia, Mercosur, New Zealand, and Thailand, contribute to most of the EU imports. Beef imports are mainly from Mercosur (44%) and, to a lesser extent, from Australia (3%). New Zealand (51%) is the EU's main provider of sheep meat. Poultry comes from Mercosur (37%) and Thailand (22%). Imports of pork and dairy are negligible compared to the other countries.

Figure 12: EU imports of meat and dairy by the 12 FTA partners (baseline in 2030, %)

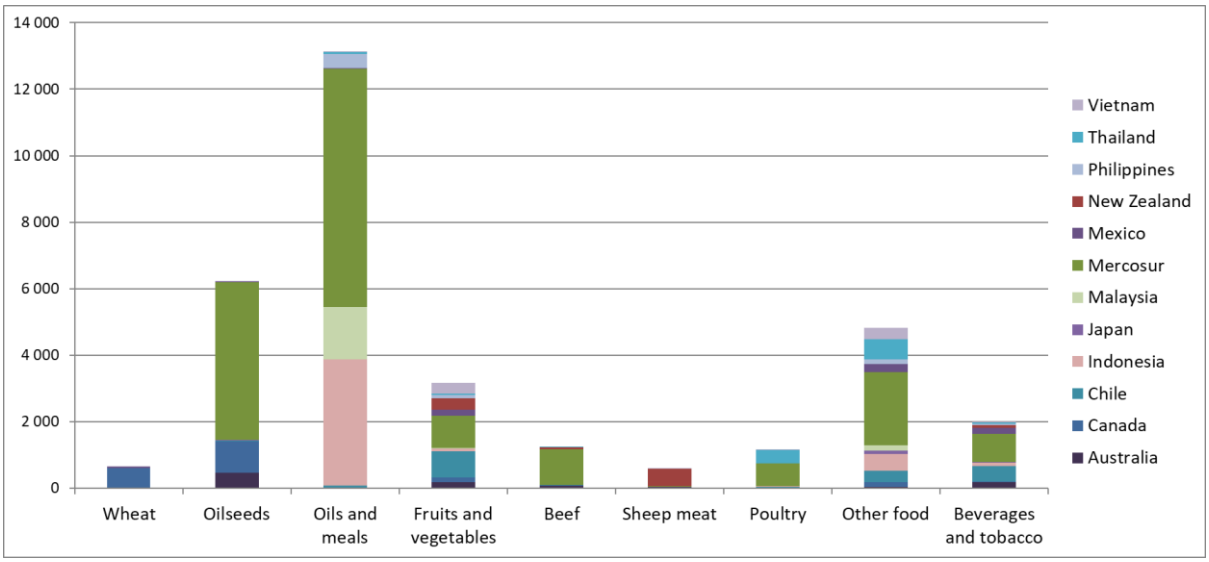


Source: Authors' calculation from MAGNET results

Analysing trade flows (Figure 13) reveals the outstanding position of Mercosur among other considered FTA partners. It supplies the EU market with many commodities such as oilseeds, oils and meals, beef, and poultry. For beef and poultry this prominence is strongly linked to preferential access granted under country-specific WTO TRQs under the Uruguay Round, successive EU enlargements, and TRQs opened under other Article XXVIII negotiations.

Other countries hold a significant share in the EU market, such as Indonesia and Malaysia for palm oil (part of oils and meals) or New Zealand for sheep meat.

Figure 13: EU imports by products and trading partners (2030, EUR million)



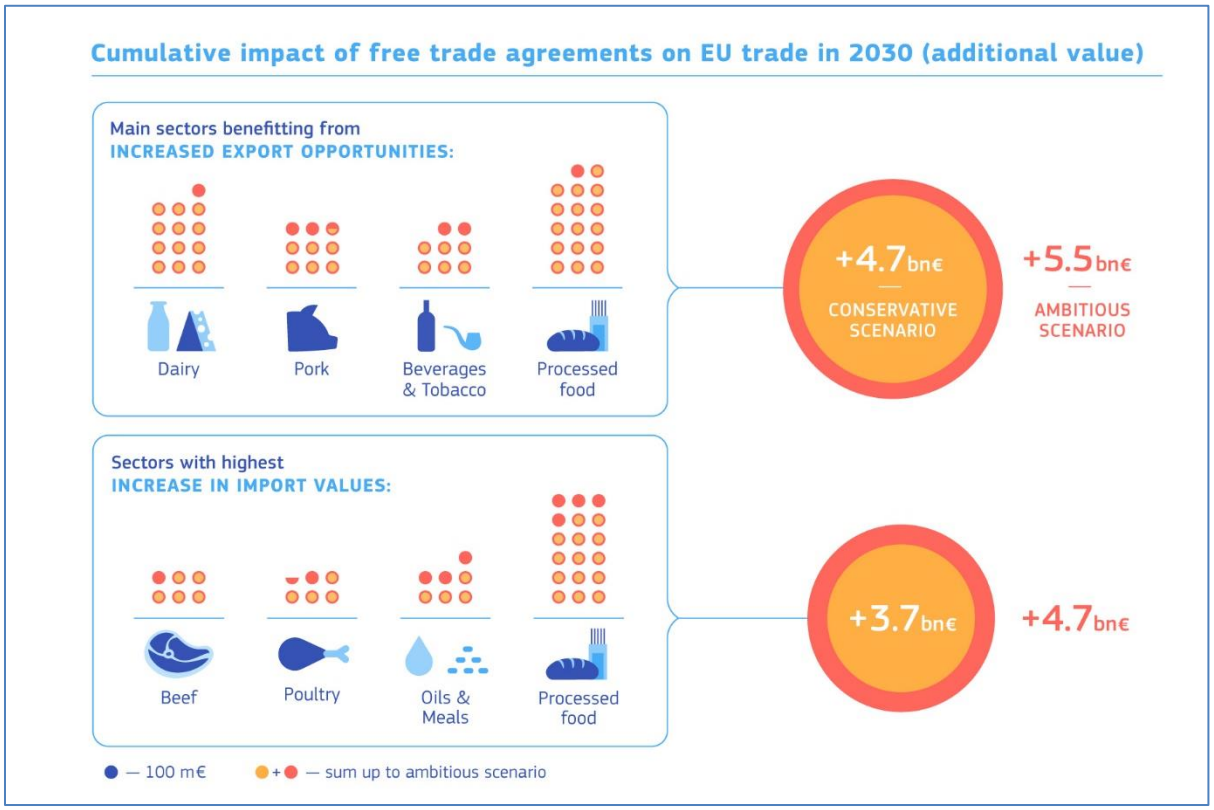
Source: Authors' calculation from MAGNET results

5 Modelling results

5.1 Overview

This section provides an overview of the changes in EU imports from and exports to the 12 FTA partner countries and to other countries as highlighted in Figure 14. It analyses the impact of the assessed conservative (CONS) and ambitious (AMBI) scenarios. Unless otherwise stated, all the results of this analysis refer to 2030 and the impacts are mainly expressed as changes compared to the baseline described in the previous section of this report.

Figure 14: Infographic on the overall change in EU trade value



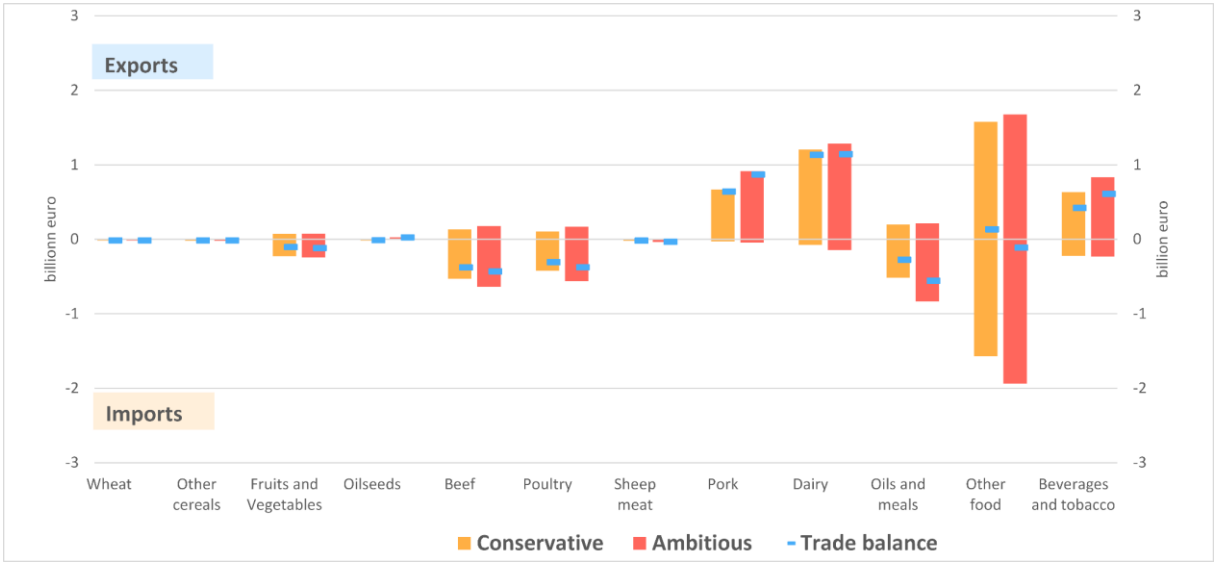
Source: Authors' elaboration

FTAs increase the access of the signing parties to each other's markets by decreasing the cost of traded goods via tariff reductions. This implies a change in the relative prices of these goods in the import and export markets, eventually lowering domestic prices of traded goods. Lower prices drive up demand for those commodities (consumption expansion effect), hence the trade of these goods within the FTAs increases, implying that FTA partners import more from partner countries and also export more to partners within the FTAs. This effect is known as the 'trade creation' effect. While trade among FTA partners increases, trade with third countries is likely to decrease, since their commodities are now relatively more expensive. This second effect is referred to as the 'trade diversion' effect, as goods formerly imported from or exported to other countries from FTA partners are now sourced within the FTAs. Our results show that overall trade volume, both imports and exports, increases in the two scenarios compared to the baseline. The results clearly reveal in which sectors FTA partners benefit the most from the agreements, thus trade within the FTA is created. Trade creation effects are particularly prominent in sectors such as beef, pork, poultry, and dairy. At the same time, trade with other countries is diverted to FTA partners. However, due to the much higher trade volume of other countries compared to the FTA partners, the percentage changes of trade and the difference between commodities are rather low, so that in most of the sectors the trade diversion effect is less pronounced.

Figure 15 shows the changes in EU trade in both scenarios compared to the baseline per commodity particularly highlighting the changes in import and export values as well as changes in the trade balance. This

figure shows that some sectors, those considered the most 'offensive' in trade negotiations, benefit from the FTA by increasing their exports, e.g., the dairy and pork sectors. Other sectors experience a significant, albeit limited compared to the EU production and consumption, increase in imports e.g., beef and poultry. The other food sector displays rather balanced changes in import and exports. The beverages and tobacco sector also reveals significant trade gains, whereas the changes for cereals, oilseeds, fruits and vegetables and sugar are quite small.

Figure 15: Changes in EU trade value of agri-food products by commodities and scenarios (2030)



Source: Authors' calculation from MAGNET results

The changes in the trade flows have a direct effect on the different agricultural markets in the EU. Sectorial impacts reflect the competitiveness of the sector in 2030 and are detailed further in this chapter. In this overview the situation in 2030 (after the implementation of all considered agreements) is compared with the current situation (2020).

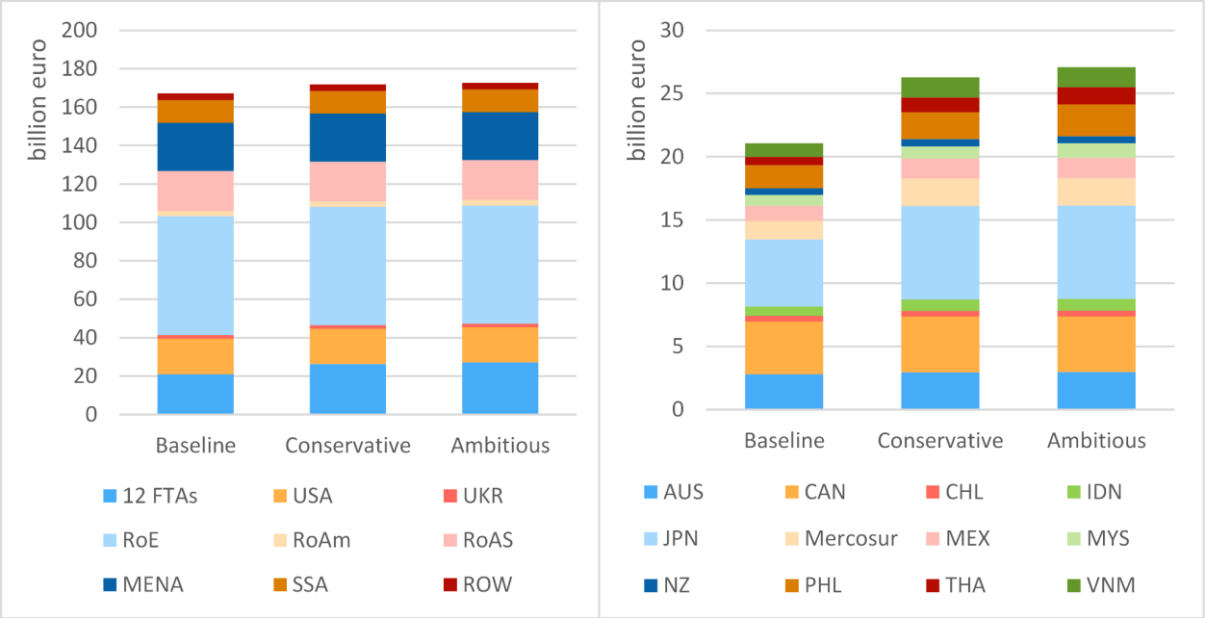
5.1.1 Changes in exports

This sub-section provides insights about the changes in EU agri-food exports. The scenario results show an increase in exports of all agri-food commodities from the EU to all the 12 FTA partners and a decrease of exports to the other regions. Furthermore, exports to the 12 FTA partners grow more under the ambitious scenario than under the conservative one. In general, exports are positive for all agri-food commodities. Specifically, pork and dairy show the highest value changes, whereas from a percentage perspective wheat and beef grow the most.

The EU exports to the 12 FTA partners increase from EUR 21.1 billion to EUR 26.3 billion (25%) in the conservative scenario and to EUR 27.1 billion (29%) in the ambitious scenario. Additional exports are mainly directed to Japan, Mercosur, Thailand, and Vietnam (Figure 16). The share of EU agri-food exports to FTA partners increases from 12.6% in the baseline to 15.3% in the conservative scenario and 15.7% in the ambitious scenario. By contrast, the share of EU exports to the other countries, equivalent to 87.4% in the baseline, slightly decrease, by 2.7 percentage points in the conservative scenario and 3.1 percentage points in the ambitious scenario.

Overall, the value of EU agri-food exports increases by 2.8% (EUR 4.7 billion) in the conservative scenario and by 3.3% (EUR 5.5 billion) in the ambitious scenario.

Figure 16: EU exports by trading partners and scenarios (2030)



(a) 12 FTA compared to other countries

(b) Comparison of 12 FTA countries

NB: For details refer to Table 16 in the annex.

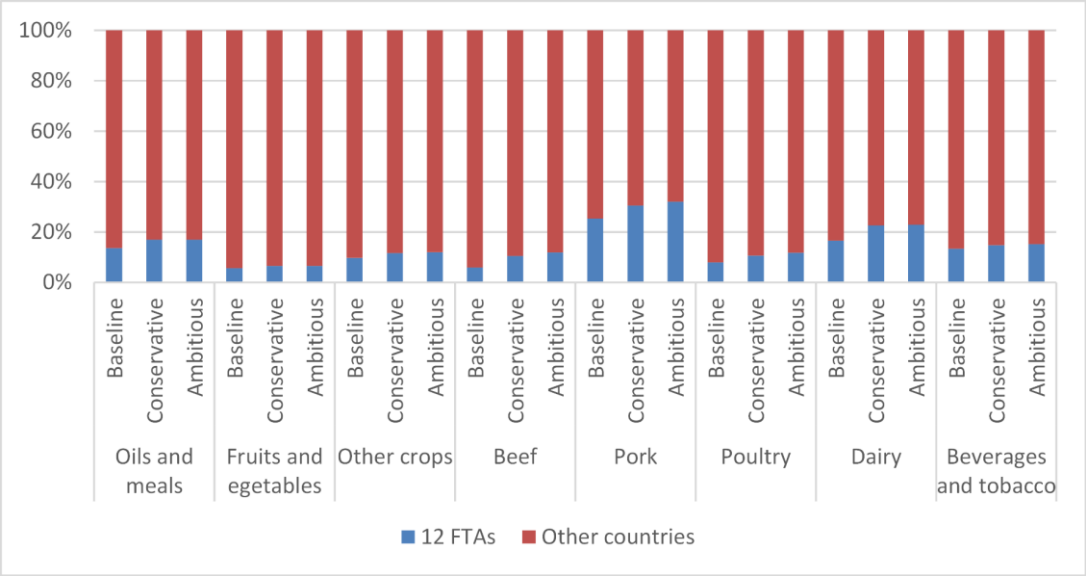
Source: Authors' calculation from MAGNET results.

Whereas exports in general grow for all agri-food commodities, the 12 FTA partners account for an important share of exports only for some of the sectors. Thus, only these sectors show a considerable increase in the total value of exports (Figure 17).

The commodities that account for the largest value changes in exports, and thus for important trade gains, are dairy, pork, other food, and beverages and tobacco. Dairy exports to FTA partners increase by 46% (CONS) and 49% (AMBI), which correspond to an increase of the export value from EUR 2.9 billion in the baseline to EUR 4.3 billion (CONS) and EUR 4.4 billion (AMBI), highlighting that dairy profits mainly from liberalisation under the recently concluded FTAs. However, pork shows a much larger difference between the two scenarios, with an increase of the export value equivalent to 28%, reaching EUR 3.3 billion, in the conservative scenario and 38% (EUR 3.6 billion) in the ambitious one, which leads to a rise of the export share of pork to FTA countries from 25% (BASE) to 30% (CONS) and 32% (AMBI) (Table 14 in the annex).

Commodities such as beef, poultry and dairy display the highest trade creation effects, whereas the trade diversion effect is not very pronounced, as the decrease of EU exports across commodities is relatively small (Table 14 in the annex). Figure 17 reveals a decline in the share of EU exports to the other regions to the benefit of the 12 FTA partners.

Figure 17: EU exports by commodities, FTA partners and scenarios (2030)



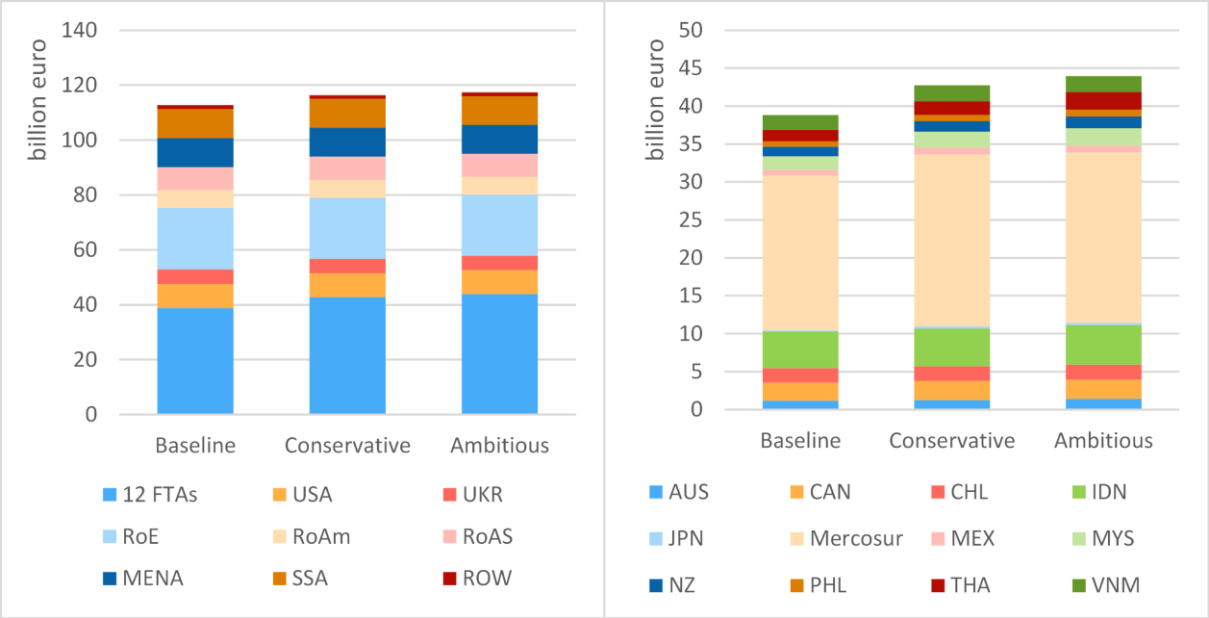
NB: For details refer to Table 14 in the Annex
Source: Authors' calculation from MAGNET results.

5.1.2 Changes in imports

The changes in EU imports in the conservative and ambitious scenarios show an increase of imports in almost all agri-food commodities from the 12 FTA partners, while imports from other countries in general decreases, although to a lower relative extent. As a consequence, the market share of the 12 FTA partners in the EU increases significantly, particularly in the beef and poultry sectors. As a general pattern, imports from the 12 FTA partners under the ambitious scenario grow more than under the conservative one, reflecting the higher trade liberalisation modelled in the former.

The imports from the 12 FTA partners increase from EUR 38.8 billion in the baseline to EUR 42.7 billion (+10.2%) in the conservative and to EUR 44 billion (+13.3%) in the ambitious scenario, (Figure 18). The conservative scenario reveals the highest absolute increase in imports from Mercosur (EUR 2.2 billion) Figure 18), panel (b)), however, under the ambitious scenario imports from Mercosur grow less than under the conservative scenario due to higher competition from other EU trading partners benefiting from better concessions (50% tariff cut applied to the sensitive products compared to 25% cut in the conservative scenario). EU imports from most of the other 12 FTA countries further increase in the ambitious scenario. Among the FTA partners, relative increases in imports are the highest for Thailand (CONS: 20.4%, AMBI: 54.9%), Malaysia (CONS: 20.3%, AMBI: 29.6%) and the Philippines (CONS: 5.7%, AMBI: 32.3%), however, starting at a much lower level compared to Mercosur. Overall, the relative figures highlight an increase in the share of agri-food imports from the 12 FTA partners of around 3 percentage points in the ambitious scenario compared to the baseline (Figure 18), contributing to 37.5% of all agri-food imports. By contrast, the countries other than the 12 considered FTA partners face a decrease of their market share to the benefit of the regions negotiating or having concluded an agreement with the EU. Overall, EU total agri-food imports increase between 3.3% (CONS) and 4.2% (AMBI).

Figure 18: EU agri-food imports and share in total agri-food imports by trading partners and scenarios (2030)



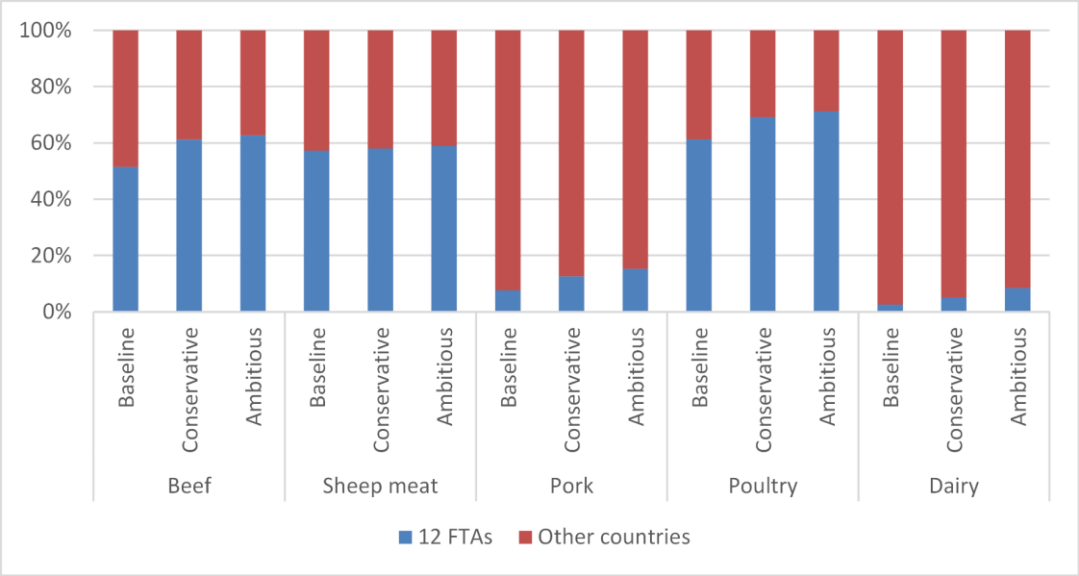
(a) 12 FTA compared to other countries (b) Comparison of 12 FTA countries

Source: Authors' calculation from MAGNET results. Details are provided in annex Table 11.

Overall, the trade creation effect is the highest in relative terms for sectors such as pork (CONS: 6.7%, AMBI: 10.3%), poultry (CONS: 21.8%, AMBI: 29.0%), beef (CONS: 21.3%, AMBI: 25.5%) and other food (CONS: 5.7%, AMBI: 7.0%). Sectors with rather insignificant changes are wheat (CONS: 0.6%, AMBI: 0.6%), other cereals (CONS: 0.3%, AMBI: 0.3%), other crops (CONS: 0.7%, AMBI: 0.8%) and oilseeds (CONS: 0.1%, AMBI: -0.2%) (details provided in Table 11 and Table 12 in the annex).

Relative changes of EU imports from other countries are small. As the direction of the change differs between commodities, the results reveal both trade creation and trade diversion effects. The highest trade diversion effects can be observed for beef meat (CONS: –3.1%, AMBI: -3.6%), poultry meat (CONS: -2.8%, AMBI: -3.9%) and oils and meals (CONS: -1.6%, AMBI: -3.3%). By contrast, commodities such as dairy (CONS: 1.3%, AMBI: 1.2%), pork (CONS: 1.0%, AMBI: 1.1%), where EU exports due to the FTA grows the most, and wheat (CONS: 0.6%, AMBI: 0.7%) reveal import gains. However, the change in the total agri-food import share depicts the diversion of agri-food trade with other countries to FTA partners. The import share of other countries decreases from 65.6% to 63.3% in the conservative and 62.5% in the ambitious scenario. Figure 19 shows the changes in the import share for selected commodities.

Figure 19: Share of the 12 FTAs in imports by commodities, origins and scenarios (2030)



Source: Authors' calculation from MAGNET results.

The 12 FTA partners increase their share in EU imports in particular for pork from 7.5% in the baseline to 12.5% and 15.2% in the conservative and ambitious scenarios, respectively, and dairy, albeit starting from a relatively low import share in the baseline equivalent to 2.6% (CONS: 5.2%, AMBI: 8.5%), as well as beef (BASE: 51.4%, CONS: 61.2%, AMBI: 62.7%) and poultry (BASE: 61.4%, CONS: 69.2%, AMBI: 71.2%). The observed increase of the share of sheep meat (BASE: 57.3%, CONS: 58.1%, AMBI: 58.9%) is rather small compared to the other meat sectors.

5.1.3 Changes in trade balance

The changes observed in the previous sub-sections impact on the trade balance of the EU. In the baseline, EU exports of agri-food products exceed agri-food imports, which results in a positive trade balance (EUR 54.6 billion). The scenarios reveal that the 12 FTAs lead to an improvement of the EU trade balance (CONS: EUR 55.6 billion, AMBI: EUR 55.3 billion), implying that EU exports increase more than EU imports (Table 6).

The trade balance considering only trade with FTA partners is negative in the baseline (EUR -17.7 billion). However, it slightly improves in the two scenarios (CONS: EUR -16.5 billion, AMBI: EUR -16.9 billion), which implies that EU exports to FTA partner countries increase more than EU imports from FTA partner countries. By contrast, the trade balance accounting for the remaining countries is positive in the baseline (EUR 72.3 billion), but also slightly lower in the conservative scenario (EUR 72.0 billion) because EU exports to these regions decline more than EU imports, whereas the trade balance remains rather unaffected in the ambitious scenarios (EUR 72.2 billion).

The ambitious scenario has a slightly smaller effect on the trade balance than the conservative scenario. The EU opens its market more in the ambitious scenario than in the conservative scenario. Due to less protection, exports and imports increase in most of the FTA partner countries more than in the conservative scenario. However, the extent to which imports and exports increase differs. The impact on the trade balance of this additional increase in trade due to reduced protection in the ambitious scenario is driven by the initial size of imports and exports in the baseline and the percentage increases in the scenarios. Although on average the percentage point increase of imports is less compared to exports, the absolute increase in imports (EUR 1.2 billion) exceeds the one in exports (EUR 0.8 billion) due to the much higher initial value, which therefore leads to a slight decrease of the trade balance in the ambitious scenario compared to the conservative scenario. Figure 20 shows, however, that sectors are differently affected, while the export increase exceeds the import increases for e.g., dairy and pork, import increases exceed export increases in sectors such as other food, poultry, and beef.

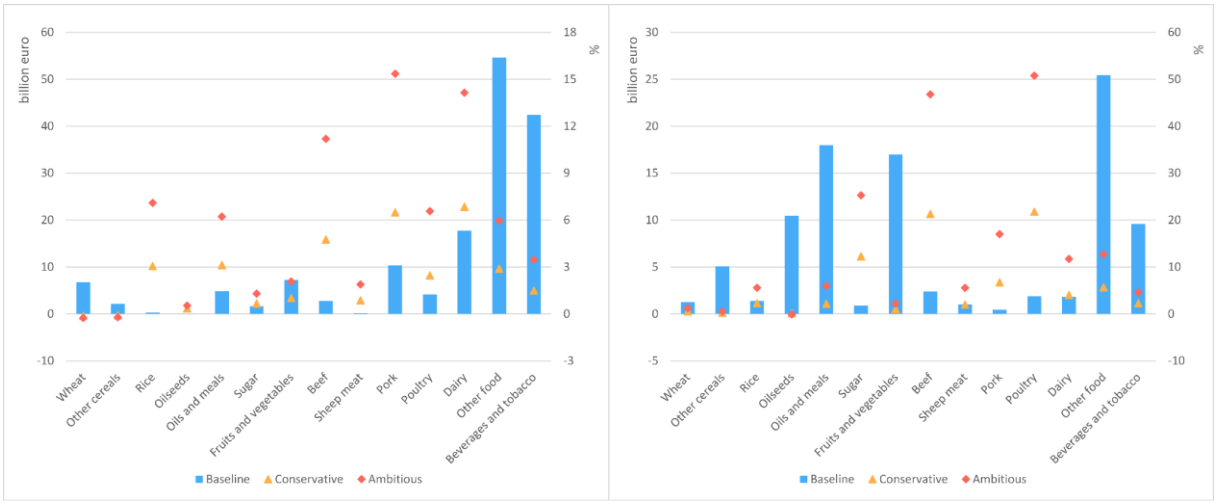
Table 6: Overview of EU trade balance for the considered agri-food categories (2030, EUR billion)

	12 FTAs			Total		
	Exports	**Imports**	**Balance**	**Exports**	**Imports**	**Balance**
Baseline	21.1	38.8	-17.7	167.2	112.7	54.6
Conservative	26.3	42.7	-16.5	172.9	116.4	55.6
Ambitious	27.1	44.0	-16.9	172.7	117.4	55.3

Source: Authors' calculation from MAGNET results

Figure 20 and Figure 21 provide details on exports, imports, and the trade balance, comparing the conservative and ambitious scenarios with the baseline. While Figure 20 shows the development of imports and exports, Figure 21 highlights the impact of different commodities on the EU trade balance with the 12 FTA partners (specific results in sub sections below). In both the conservative and ambitious scenarios, the trade balance for commodities, particularly those with a relatively high value added, such as dairy (CONS: EUR 1 142 million, AMBI: EUR 1 153 million), and beverages and tobacco (CONS: EUR 420 million, AMBI: EUR 608 million) clearly improves compared to the baseline, whereas it deteriorates for most of the other commodities such as beef (CONS: EUR -379 million, AMBI: EUR -435 million) or oils and meals (CONS: EUR -238 million , AMBI: EUR -533 million) (details available in Table 15 in the annex).

Figure 20: Development of EU exports and imports, by commodities and scenarios (2030)

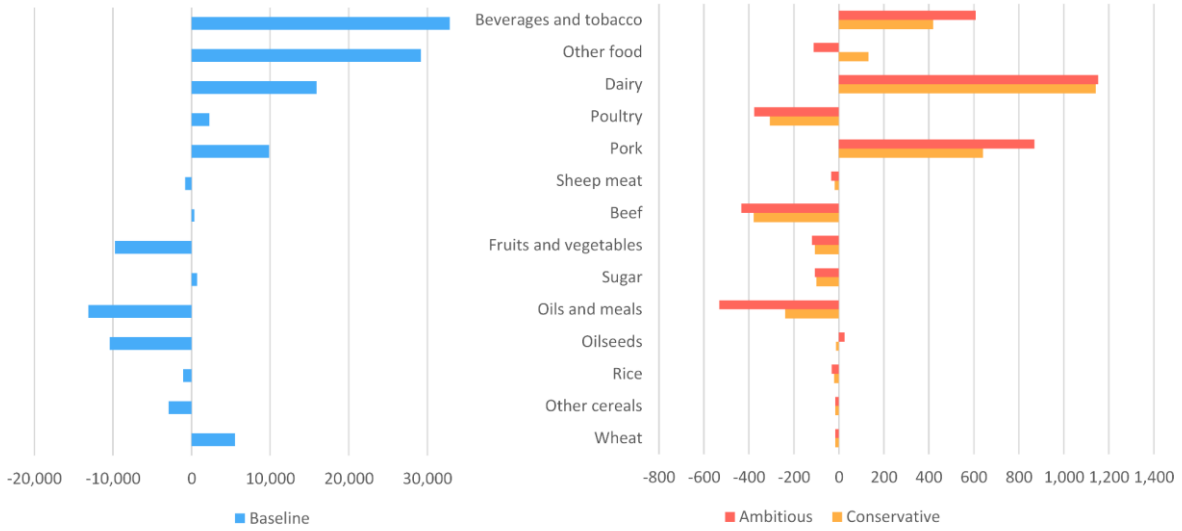


(a) Changes in exports

(b) Changes in imports

NB: Left axis presents values of exports and imports in the baseline; right axis presents percentage changes of exports and imports.
Source: Authors' calculation from MAGNET results.

Figure 21: EU trade balance in 2030 and change of trade balance in both scenarios compared to baseline (2030, EUR million)



(a) Trade balance, baseline (2030)

(b) Trade balance, absolute deviations of scenarios from the baseline (2030)

Source: Authors' calculation from MAGNET results.

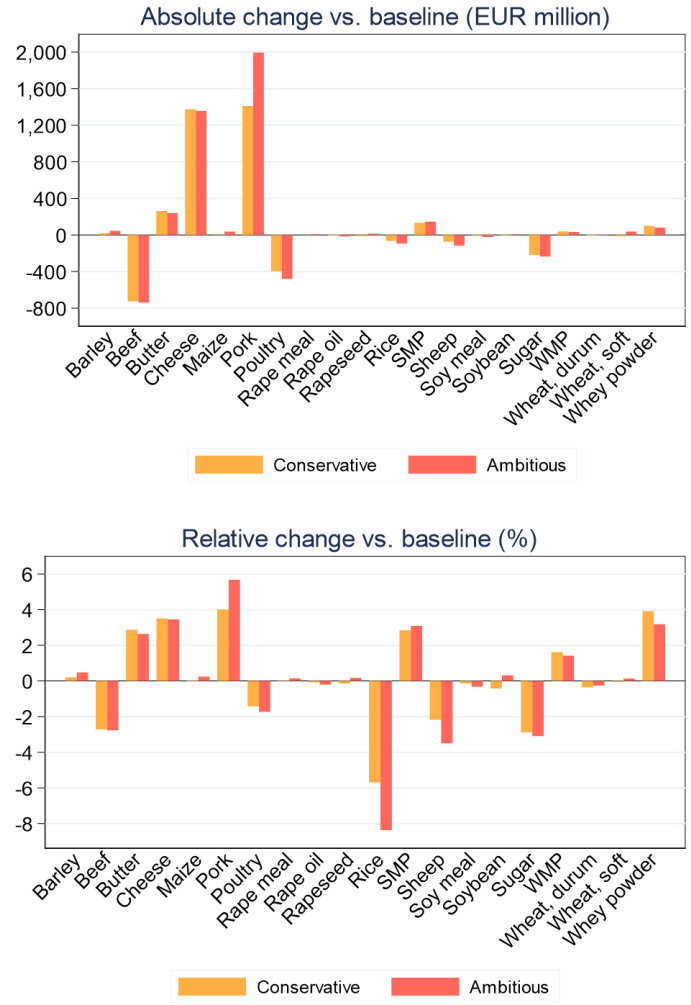
Despite the relatively balanced impacts for the EU aggregated agri-food sector, significant differences in the overall joint impact of the considered trade agreements exist between specific commodities, which are analysed by combining the results of MAGNET and Aglink-Cosimo in specific sector subsections.

5.1.4 Value of production

The impact on trade resulting from the implementation of the 12 FTAs is expected to lead to gains for most agricultural products. The resulting net increase in the total value of EU agricultural production ranges from EUR 1.8 billion to EUR 2.3 billion under the conservative and ambitious scenarios, respectively. Most of the added value is attributed to the opening up of pork, butter, cheese, skimmed milk powder, and whey markets.

Prices and production of beef, poultry and sheep meats, rice, and sugar are on the contrary projected to contract. In the case of rice, the impact on production is expected to be significant (see Section 1.1.7 for more details).

Figure 22: Value of EU production by commodities and scenarios (2030)



NB: SMP – skimmed milk powder, WMP – whole milk powder, value of production = quantity produced × producer price.
Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

5.2 Focus on specific sectors

5.2.1 Dairy

The dairy aggregate is composed of a broad range of products, including: cheese, milk and cream, butter, whey, and ice cream. Table 7 shows the share of sub-categories of the dairy products aggregate in the EU exports and imports. Cheese is the main component of the export aggregate, butter the main component of the import aggregate.

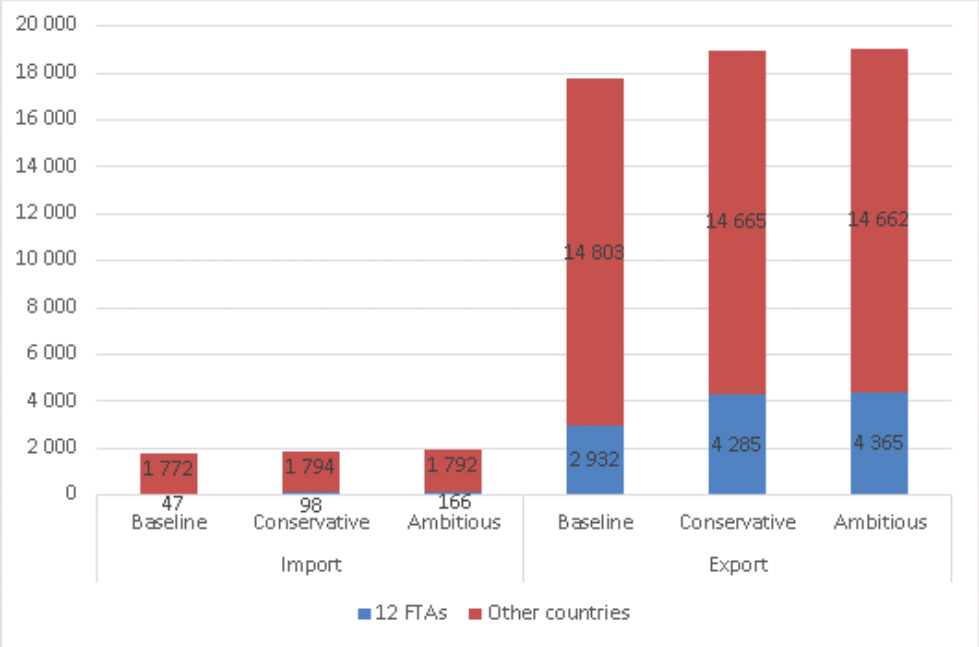
Table 7 Composition of EU dairy product aggregate trade with the 12 FTA countries in value (average 2017-2019, %)

	Exports	Imports
Milk and cream, not concentrated (HS 0401)	2.58	0.01
Milk and cream, concentrated (HS 0402)	25.41	9.61
Buttermilk, curdled milk and cream, yogurt (HS 0403)	3.24	0.07
Whey (HS 0404)	14.88	8.90
Butter (HS 0405)	6.50	70.00
Cheese and curd (HS 0406)	45.11	9.34
Ice cream (HS 2105)	2.27	2.07

Source: Eurostat Comext

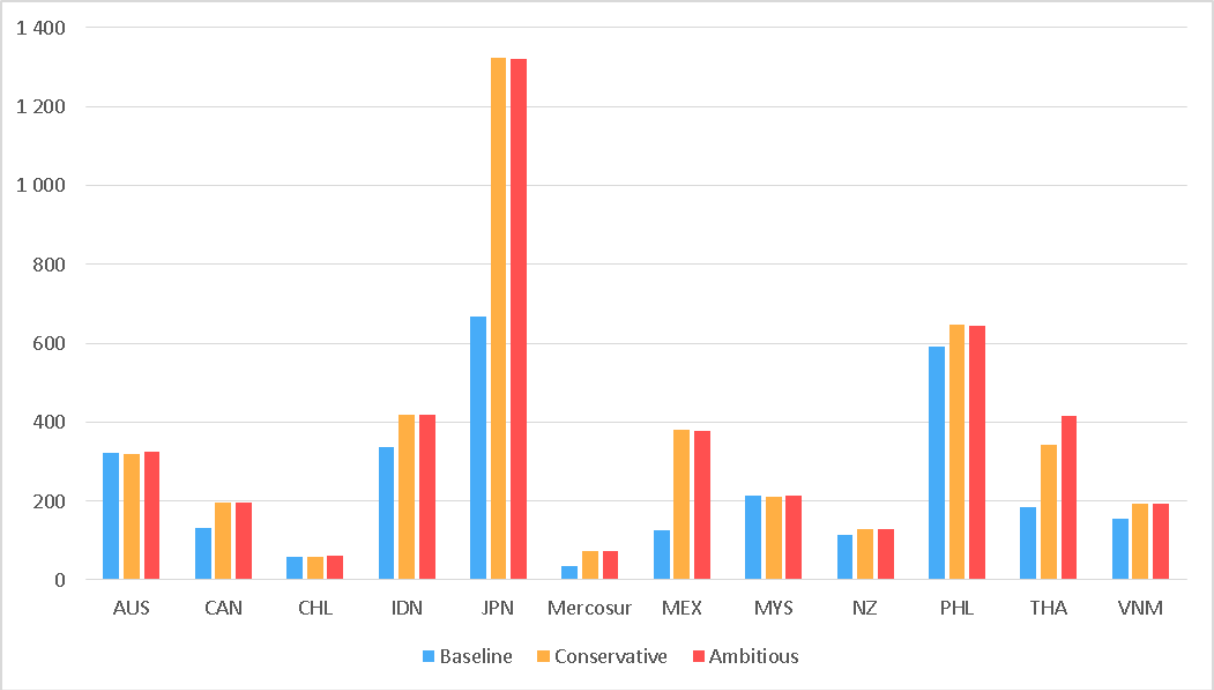
The EU dairy sector is very competitive and enjoys a substantial tariff protection, which leads to limited imports. Despite the drastic reduction of import tariffs towards the 12 FTA countries, dairy imports from the 12 FTA countries are expected to remain low in absolute terms. The only exception is New Zealand which under the ambitious scenario could expand dairy exports to the EU by around EUR 100 million thanks to the 50% cut of the initial tariff, set at around 46%. On the contrary, exports to the 12 FTA partners show a significant positive development. The final effect of liberalisation is an improvement of the EU dairy balance by more than EUR 1.1 billion under both scenarios, showing a relevant competitiveness advantage of the EU and export potential of this sector (Figure 23).

Figure 23: EU dairy imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET results

Figure 24: EU exports of dairy to the 12 FTAs countries (2030, EUR million)



Source: Authors' calculation from MAGNET results

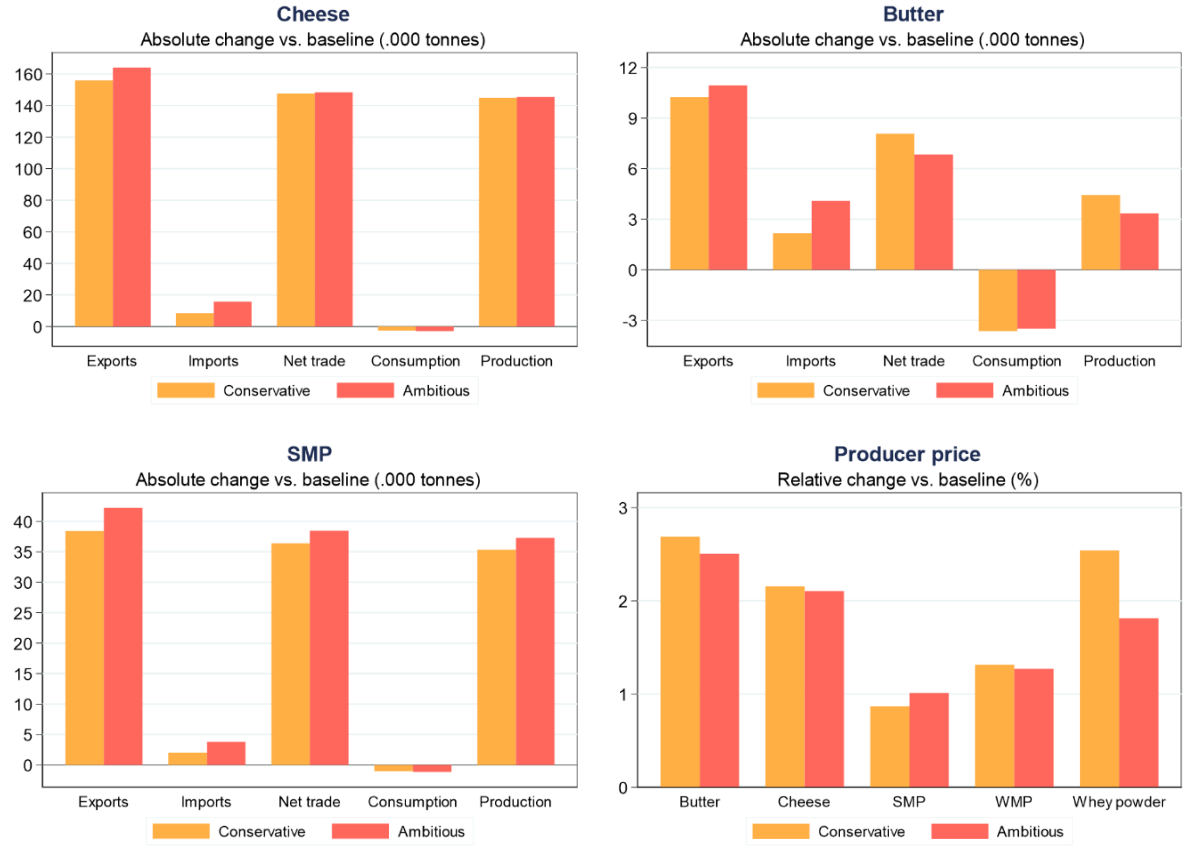
EU exports, particularly to Japan, increase significantly and exports to Canada, Indonesia, Mexico, and the Philippines show very positive outcomes (Figure 24).

To quantify and qualify the perspectives of EU exports from selected ([6]) FTA partners, Figure 55 in the annex shows their estimated growth between 2020 and 2030 and their share among the 12 FTAs countries according to the scenario. Japan increases the share in EU exports, reaching almost one third of all exports to the 12 FTA countries, with a high growth in exports.

Increased export opportunities of EU dairy commodities to FTA partners are projected to improve trade balances throughout. Cheese and skimmed milk powder (SMP) are expected to display major export growth. Due to product complementarities, international export demand will lead to higher domestic prices (between 0.9% and 2.7%) and production (≤2.1%) of the displayed dairy products. The combined effect of trade in the dairy complex is an increase in domestic milk production of about 0.2% as a result of favourable milk prices (1.3%), altogether adding EUR 890 million to the market receipts of milk producers in 2030.

([6]) FTA countries that have a relatively higher share in EU exports are presented to keep the figure readable. We follow the same approach in the subsequent share-growth figures.

Figure 25: Change in EU dairy market balances and prices (2030)



NB: SMP – skimmed milk powder, WMP – whole milk powder.
Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

5.2.2 Beef

The beef sector is one the most sensitive sectors in trade negotiations, particularly for the EU but also for many of its FTA partners. This is the reason why the EU usually chooses to grant TRQs instead of liberalising the trade with its FTA partners (e.g., in the case of Canada and Mercosur). The EU trading partner may adopt a similar approach (e.g., Japan reduced its tariffs for beef but did not eliminate them).

In the baseline, half of the EU beef imports originate from the 12 FTA partners ([7]). The EU has a negative net trade of around EUR 1 billion with these countries, almost entirely generated by the trade relationship with Mercosur. According to the MAGNET simulations, the implementation of the 12 FTAs would increase the EU beef imports under both the conservative and the ambitious scenarios by 21.3% and 25.5% respectively (corresponding to EUR 512 million and EUR 614 million respectively). Most of the increase in imports derives from Mercosur (EUR 422 million under both scenarios, i.e., 82% and 69% of the increase in imports depending on the scenario), with Australia also gaining market access (with EUR 45 million and EUR 121 million respectively). This increase is significantly below the levels projected in the 2016 study. Even if the values are not exactly comparable due to the differences in assumptions between the two studies (Box 5), this reduced impact can be primarily explained by the fact that the actual results of the Mercosur agreement have been taken into account, significantly reducing the actual market access for Mercosur beef imports. The introduction of TRQs allows more realistic scenarios to be designed than the assumptions made in 2016 did.

For Canada and Mercosur, the TRQs granted under the concluded respective FTAs are explicitly included in the scenarios (as per the concluded agreement) and the concessions to Australia are modelled using a theoretical tariff cut. This explains why the difference between the two scenarios is significant in the case of Australia,

([7]) Again, it should be noted that the United Kingdom is considered as a third country.

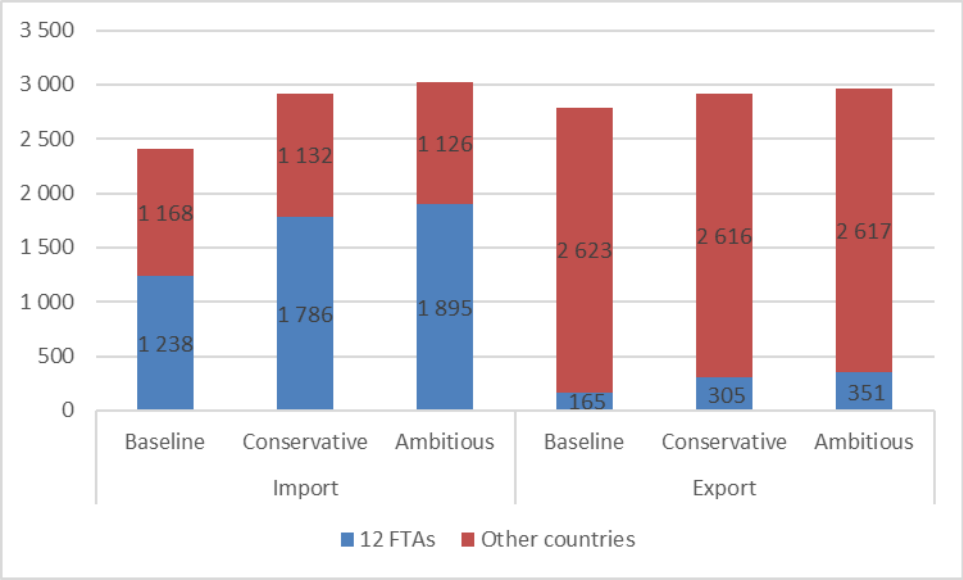
while almost negligible in the case of Mercosur where the same concessions are applied under both the conservative and the ambitious scenarios.

The consideration of the revised MoU with the United States on high-quality beef in the baseline also influenced the results, Australia and Mercosur countries are expected to initially lose market access to the benefit of the United States, before partially compensating it by out-of-quota trade. This limits the potential of trade creation under the granted TRQ in the case of Mercosur and may limit the reaction of the model in the case of Australia.

On the export side, the EU is increasing exports, mainly to Japan and the Philippines. The large increase in exports towards these two countries (EUR 90 million to Japan and between EUR 15 million and EUR 60 million to the Philippines), partially cancels out the impact of imports coming from the MERCOSUR area due to the TRQ expansion.

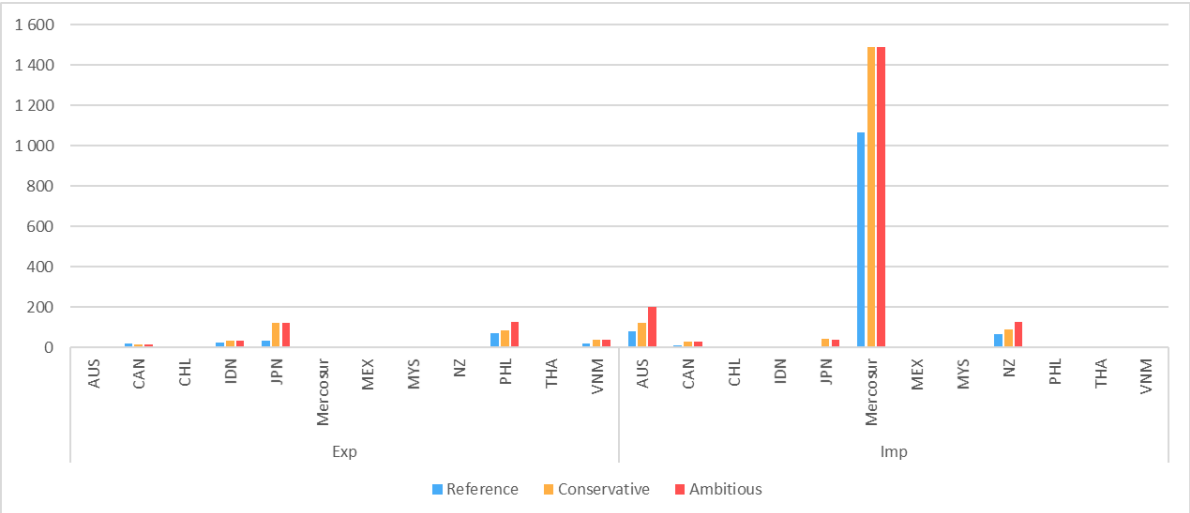
The EU trade balance deteriorates (Figure 26) due to the changes of bilateral trade with Mercosur and Australia (Figure 27) which is only partially compensated by an increase in EU exports and by a fall of imports from the other countries.

Figure 26: EU beef imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET results

Figure 27: EU imports and exports of beef to the 12 FTAs countries (2030, EUR million)



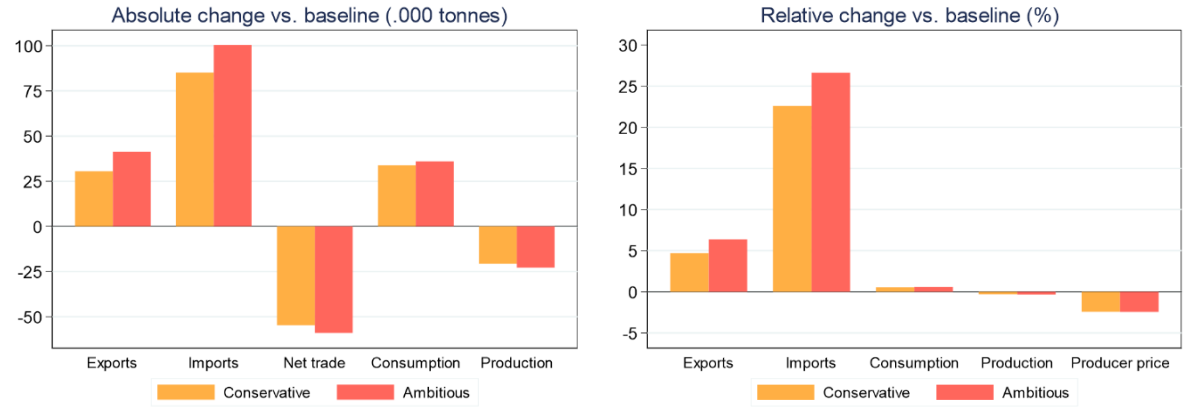
Source: Authors' calculation from MAGNET results

Figure 56 (in the annex) visualises the development of EU imports from main trading partners showing the development of growth over the period 2020–2030 and the share in the EU import market. The Mercosur region is reducing its position in the EU market, while Australia is growing its market share.

Given the scenario setting, EU beef imports would increase by about 85 000 tonnes and 100 000 tonnes compared to the baseline under the conservative and ambitious scenarios, respectively. The model projects that in 2030 the out-of–quota imports from Mercosur existing in the baseline are replaced by in-quota trade under the TRQ of 99 000 tonnes granted by the EU in the context of the bilateral negotiations. Additional trade is then created until the quota is filled. No further out-of-quota imports from Mercosur are assumed. Other FTA countries such as Australia, Canada and New Zealand are expected to also increase their exports to the EU, under a TRQ (Canada) or benefiting from tariff reductions (Australia and New Zealand). This increase is partially compensated by a decrease of imports form the other regions.

At the same time, EU exports under the conservative and ambitious scenarios would also increase, albeit by a smaller amount, due to the new trade preference obtained with the FTAs, namely 31 000 tonnes and 41 000 tonnes, respectively. The final market impact is a deterioration of the net-trade balance by 12-13%. Producer prices are projected to fall by 2.4% in both scenarios with minor effects on consumption (0.6%) and production (-0.3%).

Figure 28: Change in EU beef market balance (2030)



NB: Live animals excluded.
Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

Box 5: The differences in beef imports between this study and the previous one

There are several features that explain the different impacts on the beef sector between the report published in 2016 (Boulanger et al., 2016) and the current one and that make the comparison between the two a challenging exercise.

First, there are structural differences in the database, as in 2016 the global model MAGNET database contained an aggregate sector of beef and sheep meat.

Secondly, the EU, following the departure of the United Kingdom, has a different trade structure. The United Kingdom is now considered as a third country with its own trade relationship with the EU and other third countries. In addition, the revised MoU with the United States on the tariff rate quota for imports of high-quality beef has been taken into account within the current baseline, thus shaping the 2030 beef trade structure differently compared to the 2016 study.

Thirdly, the time horizon is different as the previous report was projected to 2025 while the current one takes into account a longer horizon reaching 2030.

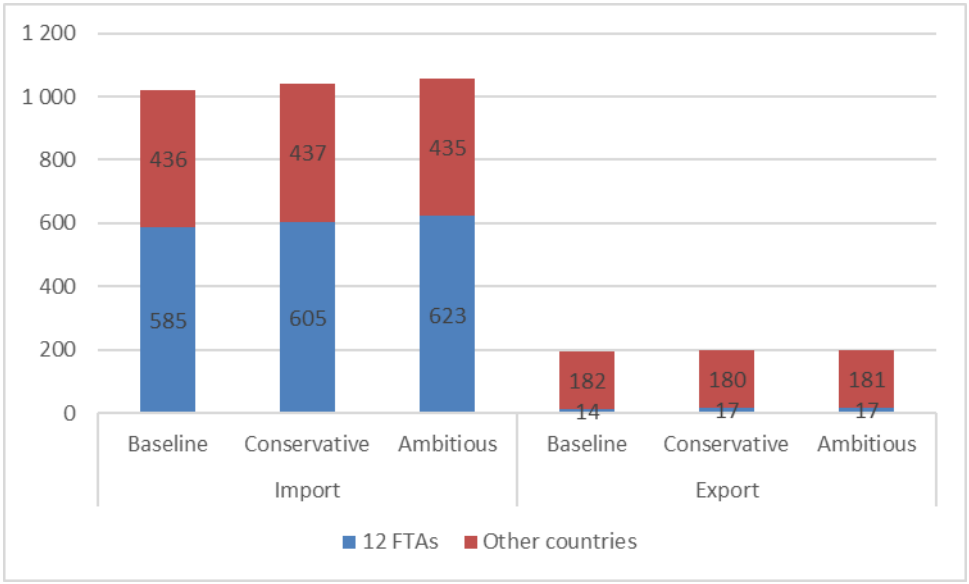
A fourth difference is due to the different set of agreements considered where the possible FTAs with the United States and Turkey have been substituted by FTAs with Chile (review of the existing one) and Malaysia.

Finally, the main reason triggering different results, particularly in the case of the Mercosur region, is the explicit modelling of the TRQs agreed with Mercosur within the trade negotiations, while in 2016 market access was granted via differentiated tariff reduction according to the scenarios. The introduction of TRQs, as described in the methodological section, allows the outcomes of the agreement to be depicted more realistically, while tariff reduction overestimates the final impacts of the shock. The difference between the two scenarios in the 2016 study (EU imports of beef and sheep meat increased by EUR 948 million and EUR 2 365 million under the conservative and ambitious scenario respectively) shows how sensitive the result is to significant tariff cuts. On the other hand, TRQs grant an increased market access that is limited in volume and do not allow a generalised reduction of costs to enter the EU. The limit of the TRQ mechanism, as designed in the MAGNET model, is that it might not entirely capture all the characteristics of the market. The fact that the increase of the EU beef imports (expressed in tonnes) results lower than the increase in TRQs allocated to the Mercosur region in the agreements due to the model mechanisms under which the out-of-quota trade that appeared in 2030 in the baseline is substituted by in-quota trade under the scenarios. If the real market conditions would be different and a certain level of out-of-quota trade would remain under the scenarios, the impacts of the agreement would be accordingly higher than the results presented in this study.

5.2.3 Sheep meat

In the sheep meat sector, imports form the 12 FTA countries represent 57% of EU imports (Figure 29), with most of the imports coming from Australia and New Zealand (Figure 30). Under both scenarios, Australia gains market access (imports are growing from EUR 41 million in the baseline to EUR 57 million and EUR 79 million under the conservative and ambitious scenarios). Imports from New Zealand, which in the baseline benefit from duty-free market access (under a WTO country-specific TRQ, which is currently not filled and is not expected to be consistently filled in 2030) suffer a slight reduction due to preference erosion ([8]) towards Australian sheep meat. Under the ambitious scenario, imports from New Zealand are reduced by about EUR 0.8 million.

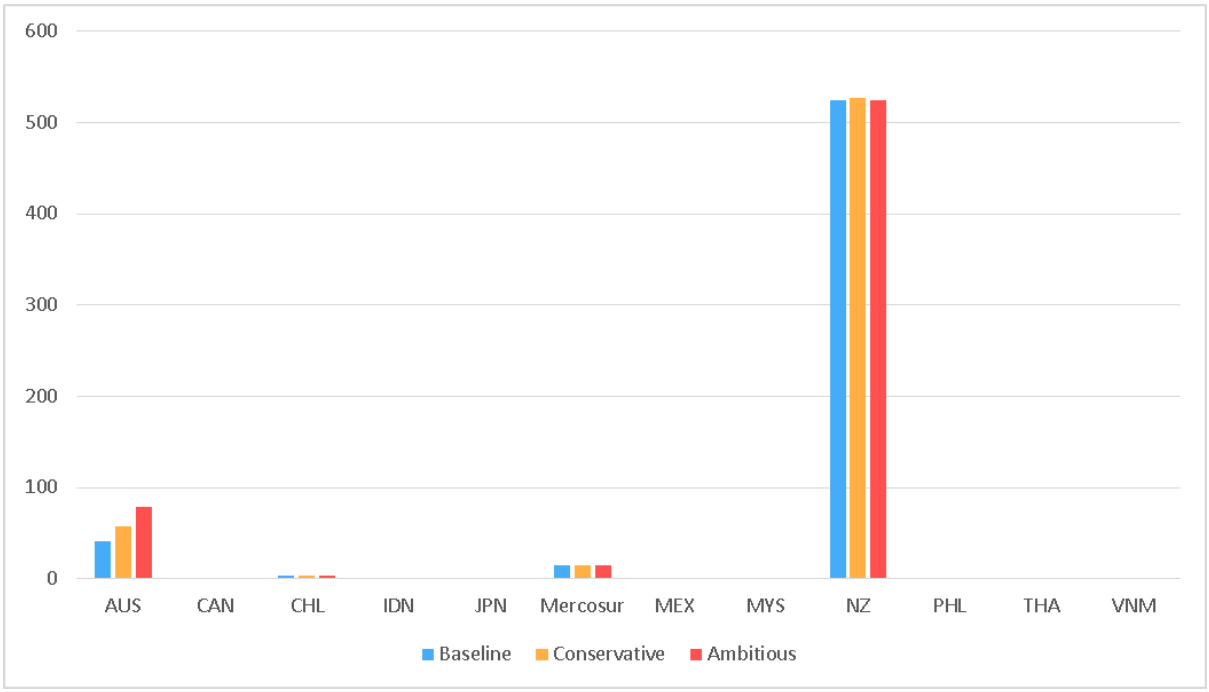
Figure 29: EU sheep meat imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET results

([8]) Preference erosion refers to declines in the competitive advantage that some exporters enjoy in foreign markets as a result of preferential trade treatment. Preference erosion occurs when export partners eliminate preferences, lower their generalised tariffs without lowering preferential tariffs proportionately or, as in this case, expand the number of preference beneficiaries.

Figure 30: EU imports of sheep meat from the 12 FTAs countries (2030, EUR million)



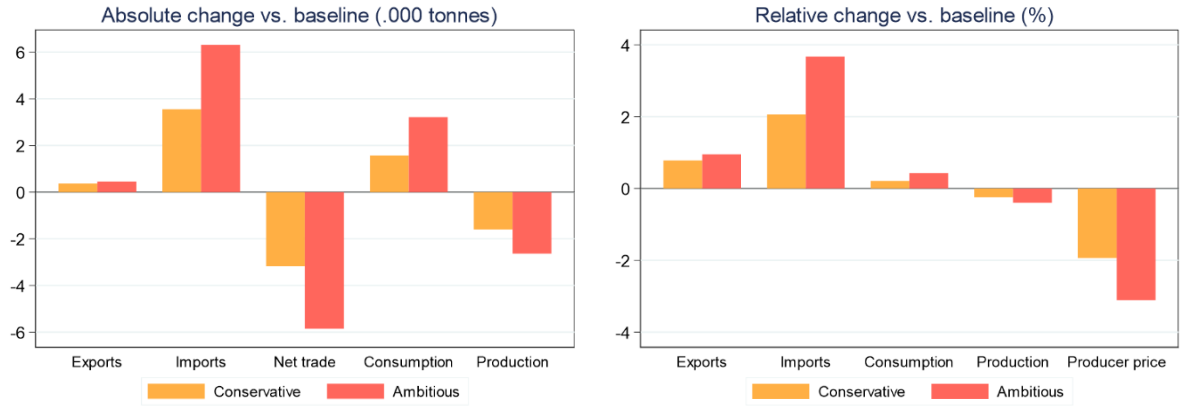
Source: Authors' calculation from MAGNET results

The EU exports of sheep meat to the 12 FTA countries are limited in the baseline (EUR 14 million) and are only marginally affected by the agreements growing to EUR 17 million under both scenarios.

The impact on the EU sheep meat market of this 3.6% (2%) increase in imports under the ambitious (conservative) scenario is projected to translate into a price decline of 3.1% (1.9%), higher consumption (0.4% and 0.2%), and contracted production (-0.4% and -0.2%) (Figure 31).

The structural differences in the database, including the new sheep meat aggregate, partially the different time horizon and in particular the different EU trade structure, following the departure of the United Kingdom, explain the smaller impacts on the sheep meat sector compared to the 2016 study.

Figure 31: Change in EU sheep meat market balance (2030)



Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

5.2.4 Poultry

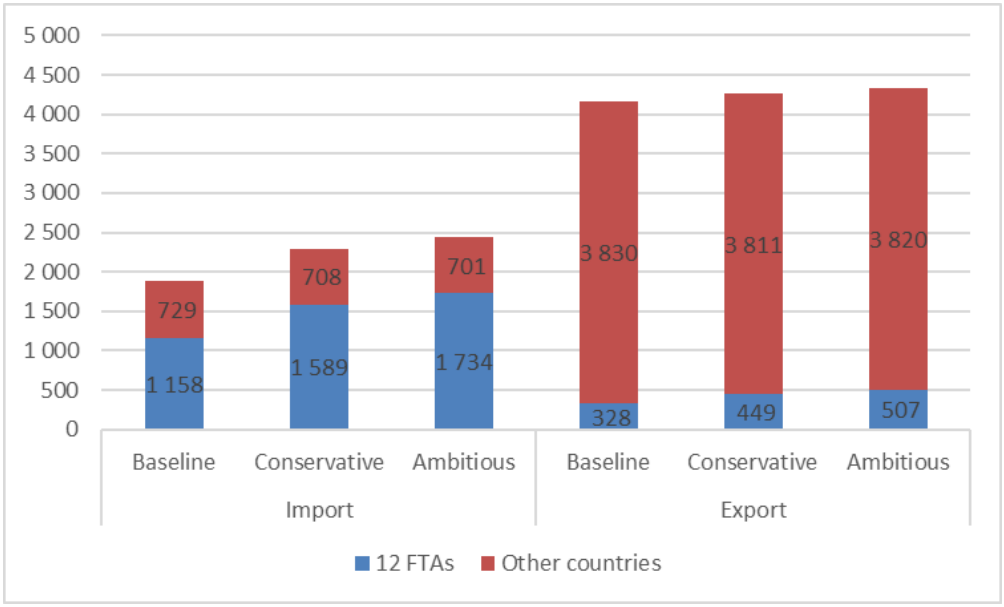
The EU imports of poultry mainly originate from Mercosur and Thailand, which make up almost 60% of EU total poultry imports and almost 95% of poultry imports from the 12 FTA countries. On the other hand, more than 90% of the EUR 4 157 million exported poultry is oriented to regions other than the 12 FTA countries.

Under both scenarios, the net effect on the trade balance is negative between EUR 308 million and EUR 377 million due to increased imports from Mercosur and Thailand. In the case of Thailand, imports are particularly significant under the ambitious scenario due to the tariff cut introduced and the absence of quantity limitations. This underlines again the relevance of modelling explicitly TRQs when assessing the impacts of future trade agreements to accurately reflect the possible impact of a trade agreement and avoid overestimating this impact. In the case of Mercosur, modelling explicitly the TRQs limits the increase of exports to the EU.

On the export side, EU trade flows increase by EUR 102 million and EUR 170 million under the conservative and ambitious scenarios. Exports increase with respect to Japan, Malaysia, the Philippines, and Vietnam. In most of these countries, tariffs on EU poultry show a significant reduction due to the FTA, providing market opportunity to EU poultry exporters.

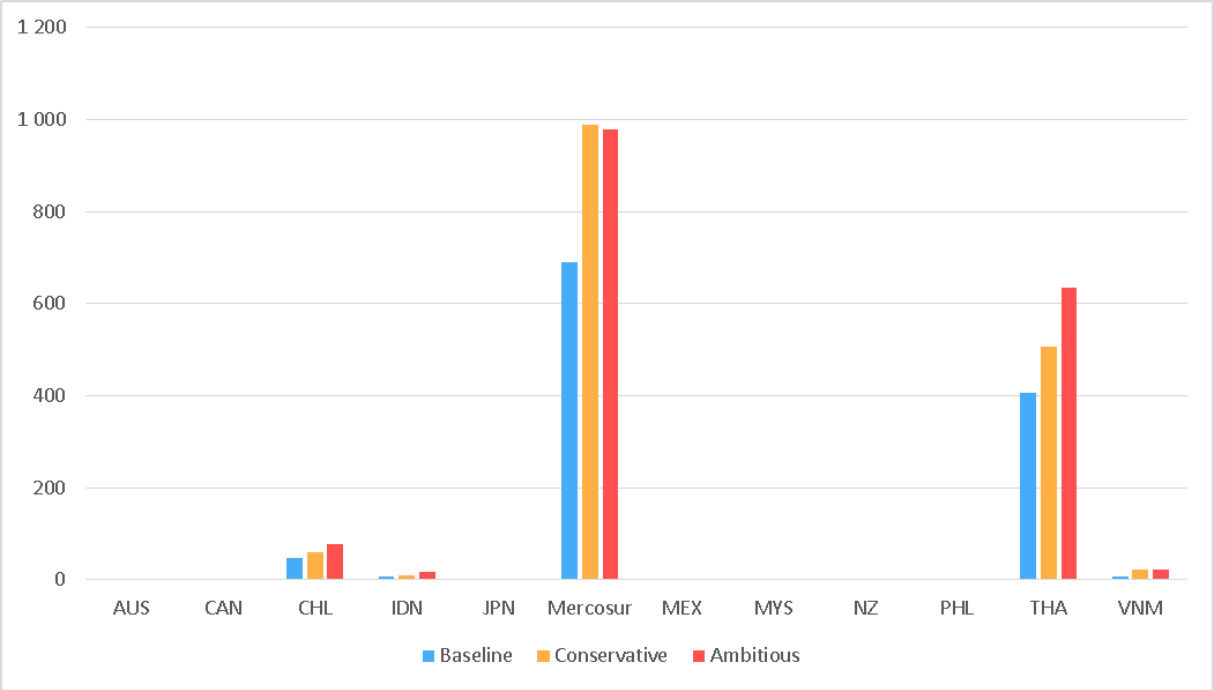
Looking at the 12 FTA partners, three of them account for most of the growth in EU imports (Chile, Mercosur, and Thailand), with Mercosur getting the biggest share. In absolute terms, under the ambitious scenario the increase in imports from Thailand (+ EUR 229 million), for which no TRQ is assumed, is comparable to the increase from the Mercosur block (+ EUR 288 million). Market shares remain relatively stable under the different scenarios (Figure 33). The effects of the 50 000 tonnes additional duty-free market access for poultry granted to Ukraine in 2020 is already reflected in the baseline.

Figure 32: EU poultry imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET results

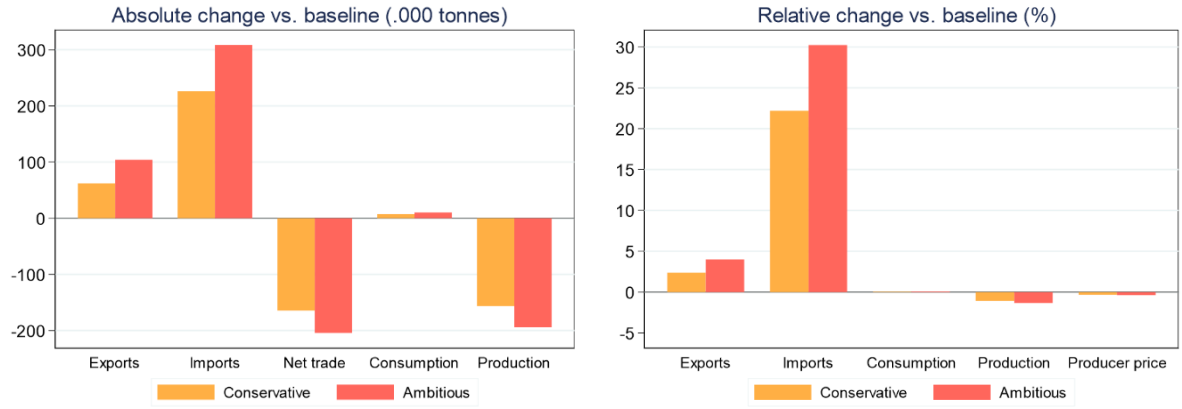
Figure 33: EU imports of poultry from the 12 FTAs countries (2030, EUR million)



Source: Authors' calculation from MAGNET results

The EU poultry balance in 2030 is driven mainly by imports, which rise by 22% and 30% under the conservative and ambitiuos scenarios compared to the baseline. The effect on production is limited to -1.4% (AMB) and -1.1% (CONS) compared to the baseline, which still translates in a moderate production growth in 2030 compared to 2020. Consumption and prices, on the other hand, are projected to remain rather unaffected, close to the baseline levels. Due to the higher elasticity of poultry supply (i.e., short production cycles, expandable production), this sector responds smoothly to market signals, such as those emerging from trade disruption (Figure 34).

Figure 34: Change in EU poultry meat market balance (2030)



Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

5.2.5 Pork

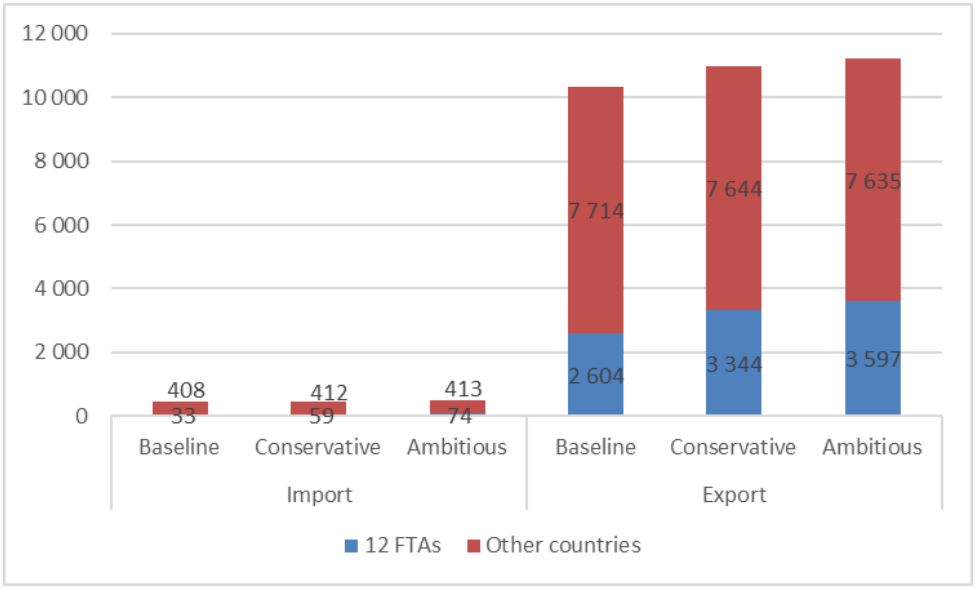
The EU has a highly positive trade balance for pork, which reaches EUR 9.8 billion in the 2030 baseline. Following the conclusion of the 12 FTAs, a further overall positive trend by EUR 640 million under the conservative and EUR 869 million under the ambitious scenario is expected. In the 2030 baseline, the EU is due to export EUR 10 318 million of pork, out of which EUR 2 604 million to the 12 FTA countries. Japan is the destination of 60% of the exports to the 12 FTA countries while exports of pork to Australia, Canada and, the

Philippines make up one third of pork exports to the 12 FTAs. Exports to Japan and the Philippines absorb most of the EU increase under the scenarios. While the increase to Japan is stable at around EUR 510 million under both scenarios (reflecting the implementation of the concluded FTA), the increase of EU exports to the Philippines is particularly steep under the ambitious scenario, where it is estimated to increase by more than EUR 300 million.

On the other hand, most of the baseline imports (EUR 408 million out of EUR 441 million) come from countries other than the 12 FTA countries. For this reason, the imports change under both scenarios is very limited.

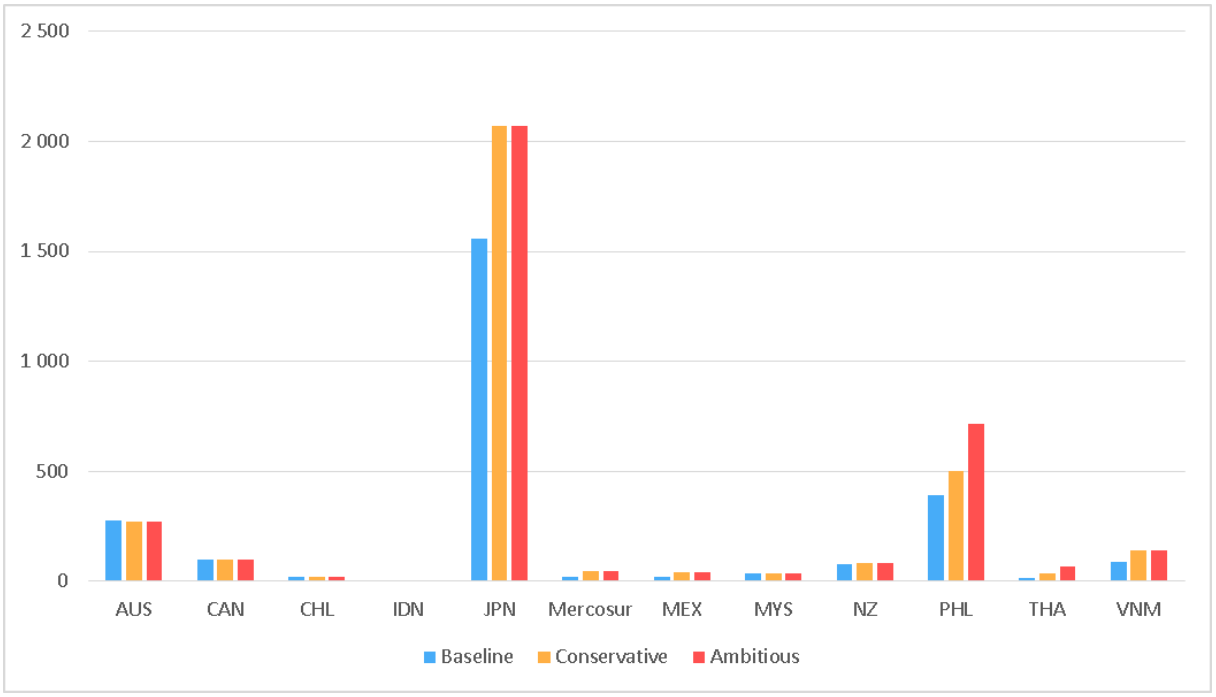
The final effect on the trade balance is positive, as the balance versus FTA countries improves by more than 30% under the ambitious scenario. The net trade balance versus all other countries, due to a decrease in export of between EUR 70 million and EUR 79 million, deteriorates by 1%.

Figure 35: EU pork imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET result

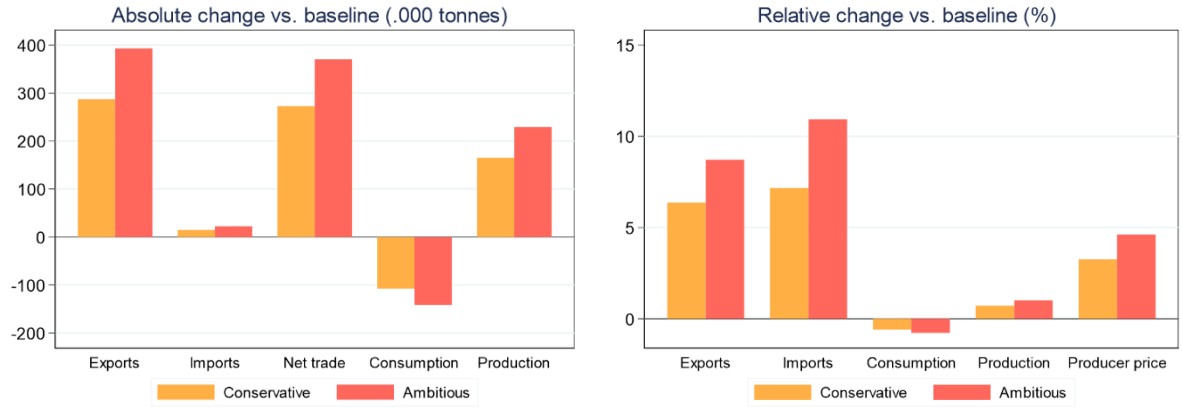
Figure 36: EU exports of pork to the 12 FTAs countries (2030, EUR million)



Source: Authors' calculation from MAGNET results

The EU pork balance is driven by additional exports (8.7% in the ambitious scenario, 6.4% in the conservative). Domestic pork consumption drops by less than 1% in either case (Figure 37). In the ambitious (conservative) scenario, the 4.6% (3.3%) price increase combined with a 1% (0.7%) production expansion raises the value of expected EU pork production in 2030 by EUR 2 (1.4) billion.

Figure 37: Change in EU pork market balance (2030)



Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

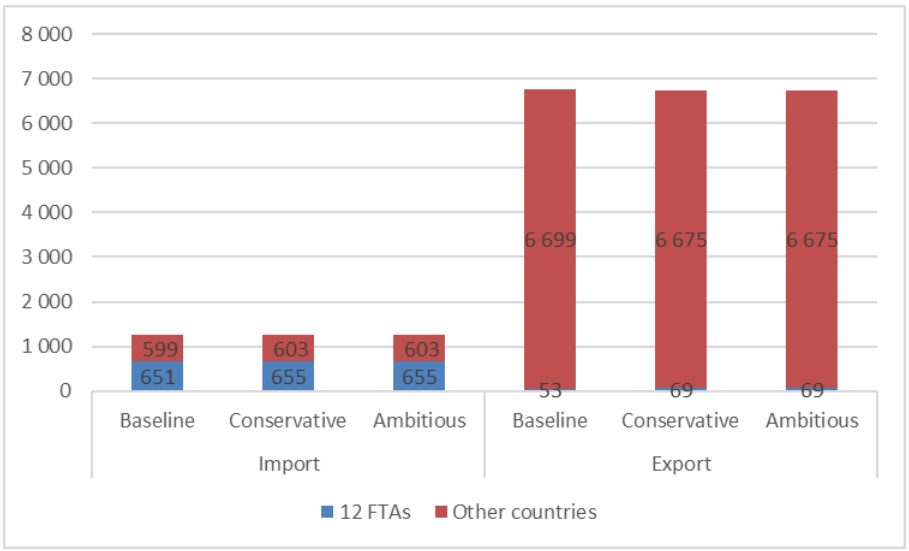
5.2.6 Wheat, other cereals, and oilseeds

Trade impacts in wheat, other cereals and oilseeds are limited (Figure 38, Figure 39, and Figure 40) given the low initial tariffs and the very low share of EU exports to the 12 FTA regions (compared to the weight of non-FTA regions) in all the crops.

Net-trade balances of grains (soft and durum wheat, barley, maize, soybean) are projected to contract by ≤0.7% due to higher import demand. An exception is soybean in the ambitious scenario where lower EU

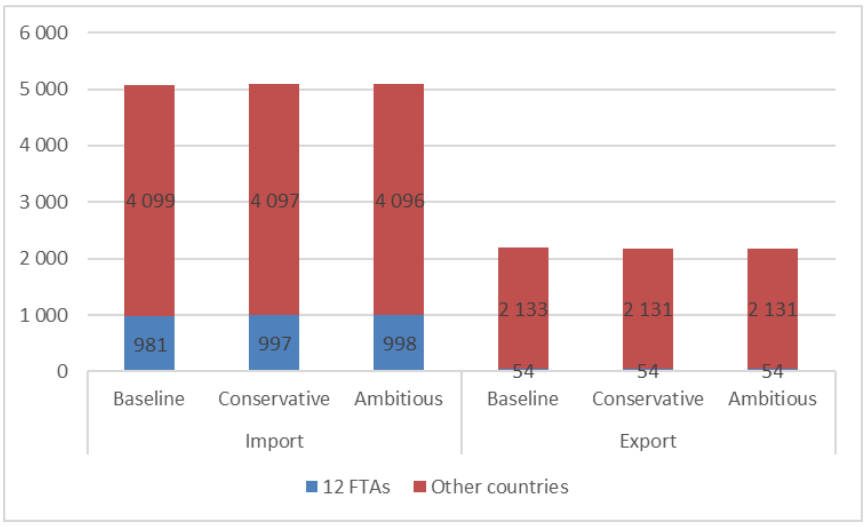
imports improve the trade balance by 0.2%. Domestic prices of grains diverge merely from baseline levels from -0.3% to 0.4%. Barley and maize will enjoy the highest production increase (40 000 tonnes and 31 000 tonnes, respectively, in the ambitious scenario) (Figure 41). As changes in the animal sector modify the internal feed demand composition, imports of rapeseed and soy meals will increase by 2.2% and 0.8% respectively (ambitious scenario), however having near-zero impact on domestic production and prices. Overall, the impact on prices and production value is positive for the EU arable crops sector. The value of production declines in the cases of soy meal (by EUR about 21 million), rape oil (by about EUR 15 million), wheat (by about EUR 13 million), and soybean and rapeseed (by EUR 8-11 million each, only in the conservative scenario).

Figure 38: EU wheat imports and export (2030, EUR million)



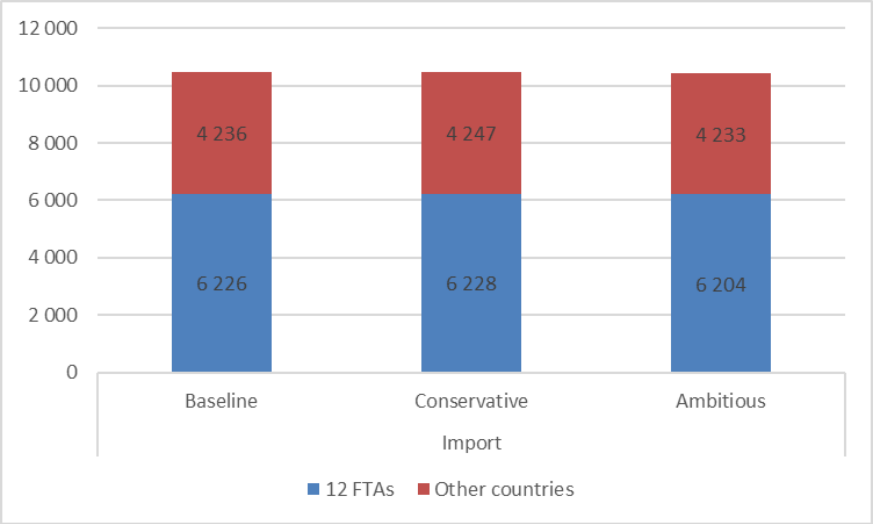
Source: Authors' calculation from MAGNET results

Figure 39: EU other cereals imports and export (2030, EUR million)



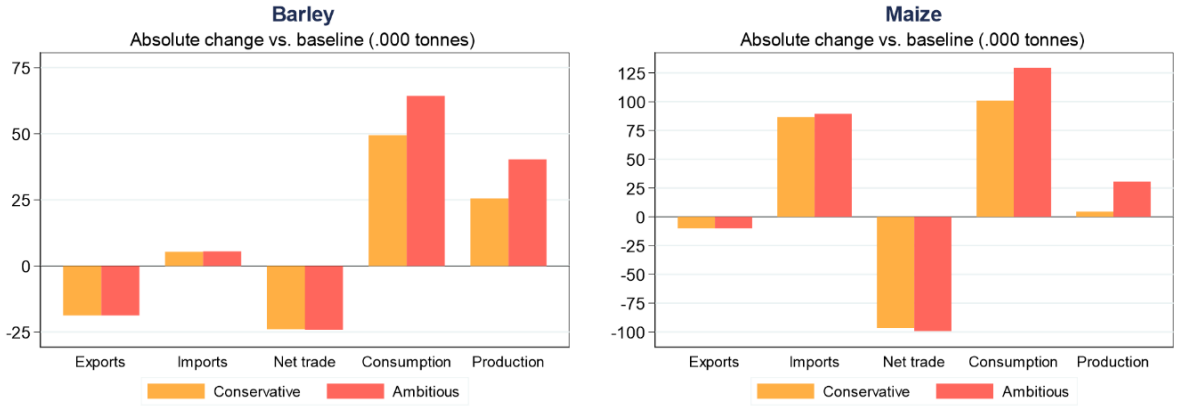
Source: Authors' calculation from MAGNET results

Figure 40: EU oilseeds imports (2030, EUR million)



Source: Authors' calculation from MAGNET results

Figure 41: Change in EU barley and maize market balances (2030)



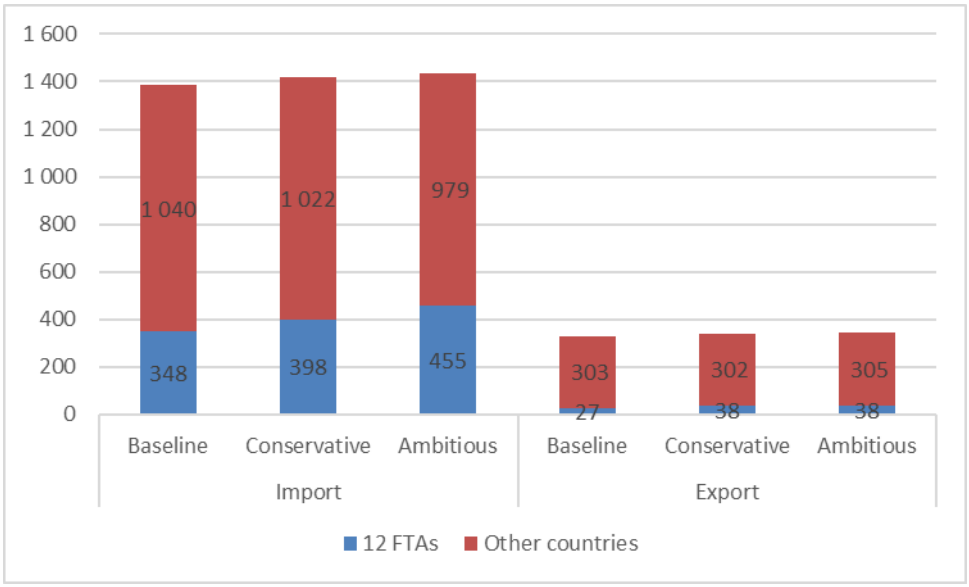
Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

5.2.7 Rice

In the context of the 12 analysed FTAs, according to the baseline in 2030, the EU will import a significant amount of rice from Thailand (EUR 250 million, corresponding to 18% of the EU rice imports). After the implementation of the 12 FTAs, overall rice imports increase between 2.3% and 3.3% under the conservative and ambitious scenarios. The additional imports are dominated again by Thailand, which under the simulated scenarios enjoy an improved market access through tariff cut and whose exports increase between EUR 51 million and EUR 108 million. At the same time, imports from Mercosur and Vietnam, which are constrained by the agreed TRQ under both scenarios, remain roughly stable to the 2030 baseline level as their trade preference is largely eroded by the steep export increase from Thailand. The trade diversion effect is larger for rice than for other sectors, because imports account for a far higher share of the EU market. The additional imports from the 12 FTA countries amount to EUR 107 million in the ambitious scenario. However, total imports only increase by EUR 46 million, as the other countries will lose some of their market shares, dropping from 75% to 68%.

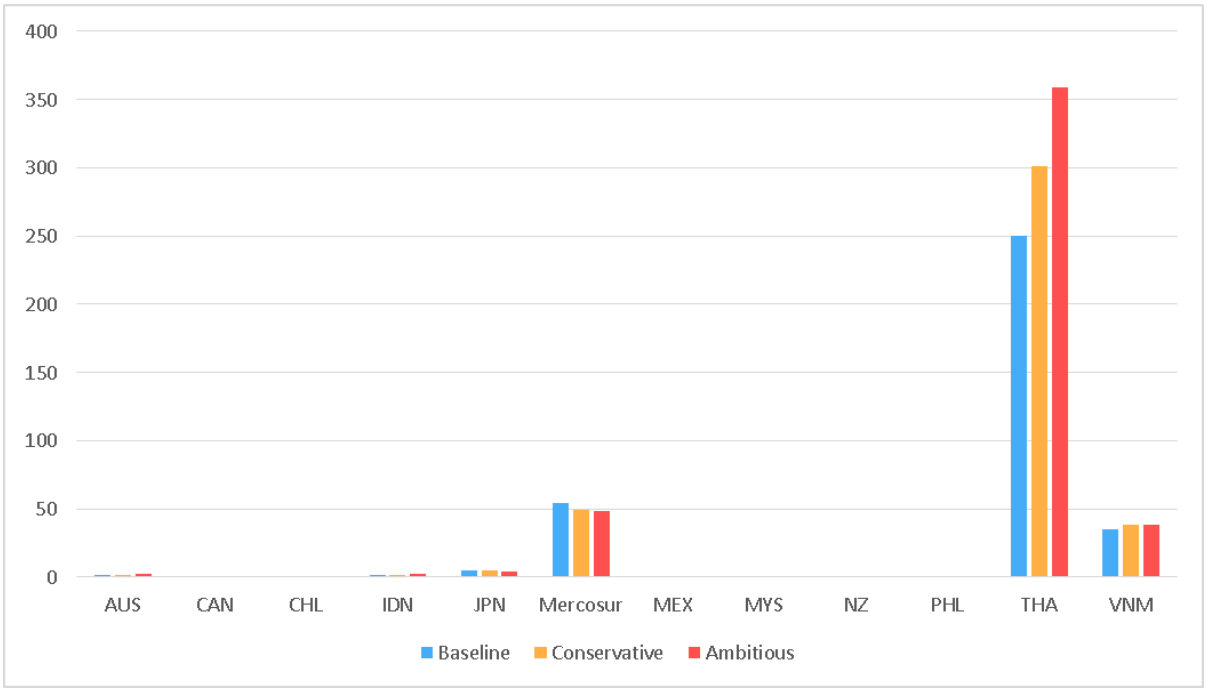
Among the FTA partners, Thailand has the highest market share into the EU in the baseline and it expands progressively under the two scenarios from 72% to 76% and 79% respectively (Figure 43).

Figure 42: EU rice imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET results

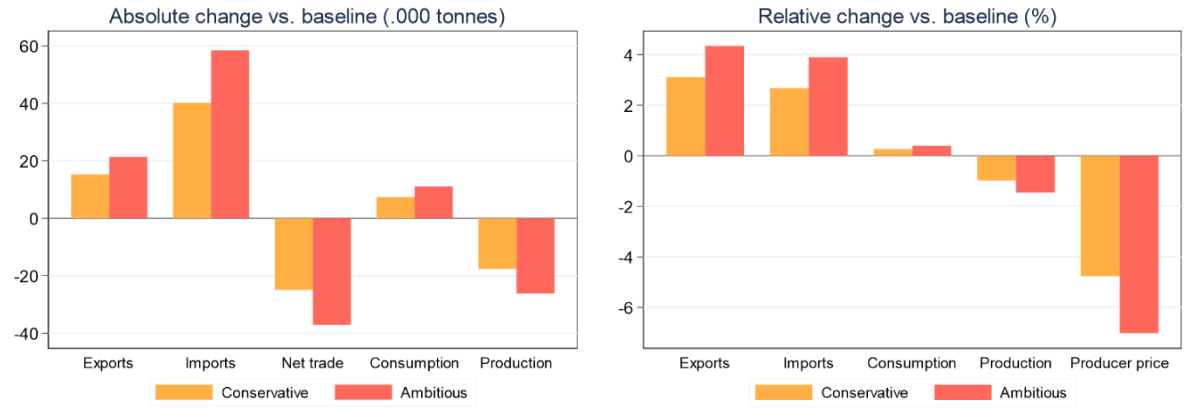
Figure 43: EU imports of rice from the 12 FTAs countries (2030, EUR million)



Source: Authors' calculation from MAGNET results

As rice imports represent a large share of EU rice consumption, small trade distortions may bring about a significant impact on the market balance. The Aglink-Cosimo model, however, does not consider rice market segmentation (e.g., Indica and Japonica partially compete with one another). Under the ambitious (conservative) scenario, EU rice production and prices drop by 1.5% (1%) and 7% (4.8%) respectively, leading to a reduction in the value of expected EU production by EUR 95 (64) million in 2030 (Figure 44).

Figure 44: Change in EU rice market balance (2030)



Source: Authors' estimates based on Aglink-Cosimo simulations (EC 2019 model version)

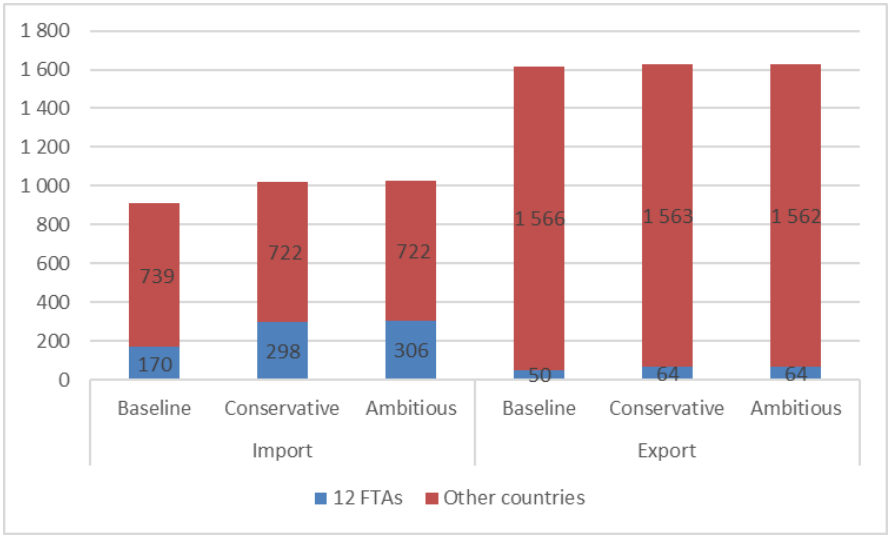
5.2.8 Sugar

After the end of the sugar quota system in 2017, the competitiveness of the EU sugar production has increased on the world market. Trade statistics show that as from 2017 the EU has had the potential to switch from being a net importer to a net exporter. Model results show that this potential will be achieved by 2030 when the EU will be a net sugar exporter. On the other hand, in the baseline the net trade versus the 12 FTA partners is negative by EUR 120 million, particularly due to the negative balance with Mercosur countries, while imports from the rest of the 12 FTAs are limited.

The bilateral trade flows of sugar are not very much affected from FTAs except for Mercosur, a major world player, which increases its exports to the EU under both the conservative and ambitious scenarios, as a result of the concessions granted to Brazil and Paraguay under the EU–Mercosur agreement. Imports from Mercosur increase by EUR 116 million, setting the negative trade balance at EUR 261 million. Imports from Australia, another competitive player, remain very low in both scenarios considering that the duty levels in both scenarios provide sufficient market protection. They may increase further depending on the market access preferences granted.

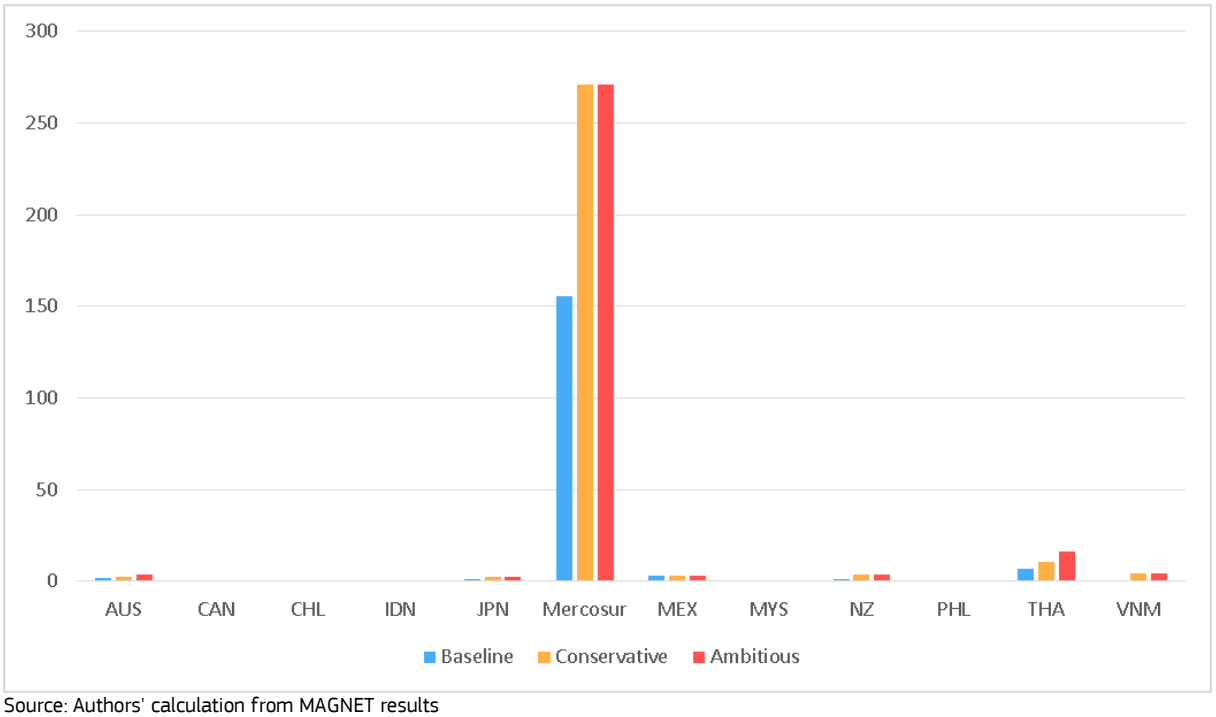
The increase in imports from the 12 FTAS is not compensated by a decrease of imports from other countries whose trade fall by only about EUR 17 million. The final sugar imports are 12% to 13% higher under the two scenarios than the baseline.

Figure 45: EU sugar imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET results

Figure 46: EU imports of sugar from the 12 FTAs countries (2030, EUR million)



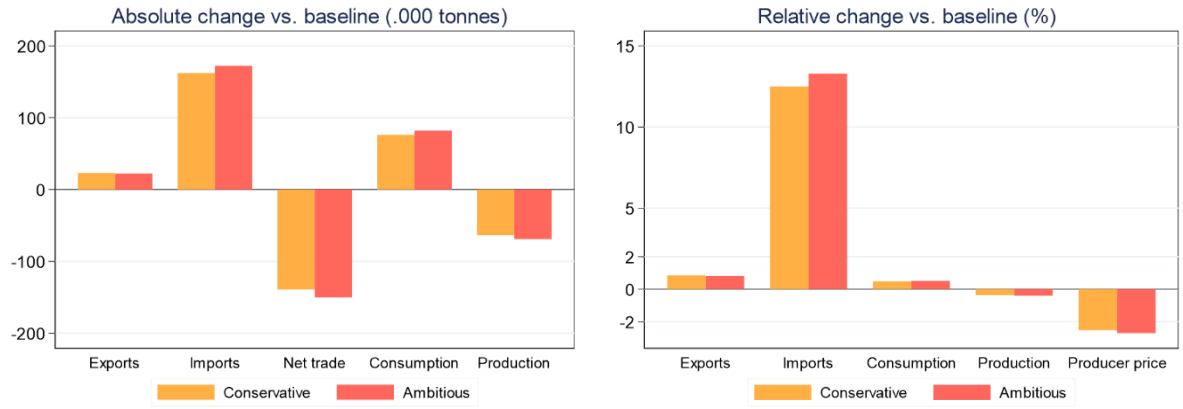
Source: Authors' calculation from MAGNET results

On the export side, almost 97% of EU exports go to other countries outside the 12 FTAs. Thus, under both scenarios exports increase is almost negligible (Table 24 in the annex).

Despite a fall of around EUR 100 million, the EU sugar net trade will remain positive under both scenarios.

Overall, the impact on domestic sugar production is limited to -0.4% in either scenario, while sugar prices are slightly differentiated (-2.7% in the ambitious scenario and -2.5% in the conservative) (Figure 47).

Figure 47: Change in EU sugar market balance (2030)



Source: Authors' calculation from Aglink-Cosimo simulation results (EC 2019 model version)

5.2.9 Fruits and vegetables

The Aglink-Cosimo model does not cover the fruit and vegetable sectors. For this reason, all results related to these sectors come from the MAGNET model. Within the MAGNET database, fruits and vegetables are aggregated into a single sector composed mostly of fresh produce.

The EU production is barely affected by the 12 FTAs under either of the scenarios, declining slightly (around 0.3%).

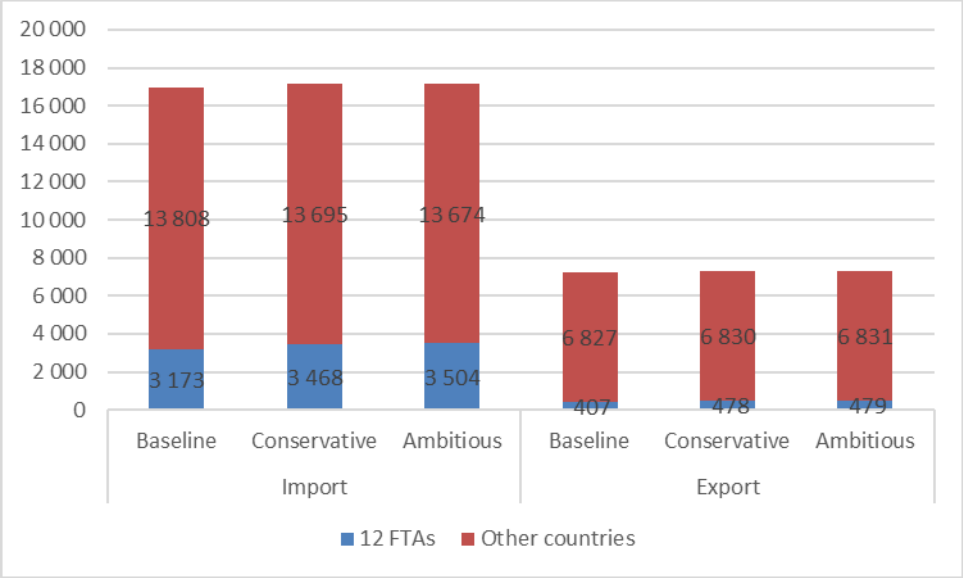
Overall, the trade balance with the 12 FTA partners deteriorates by more than EUR 200 million, Mercosur and New Zealand being the main partners that improve the most their trade balances toward the EU (Table 25 in the annex).

The reason for this small impact on the EU fruit and vegetable sector is two-fold. On the imports side, the tariff rates the EU imposes on imports from the 12 FTA partners are already low in the baseline. Hence, further trade liberalisation does not trigger any significant impact apart from an increase of imports from the Mercosur region, only partially compensated by an increase of the EU exports to the Mercosur region. On the exports side, low tariffs and low volumes characterise the baseline trade between the EU and the 12 FTA partners. More than 80% of the EU exports reach the rest of Europe and MENA countries, while the share of the 12 FTA partners adds up to merely 5%. Hence, trade liberalisation does not produce any relevant impact on the EU fruits and vegetables export pattern.

The EU net trade deteriorates between EU 107 million and EUR 120 million under the two scenarios.

It should also be underlined that the MAGNET model does not account for the entry price system in force within the EU, thus it cannot provide a completely realistic picture of these very complex markets.

Figure 48: EU fruits and vegetables imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET results

5.2.10 Vegetable oils and meals

In 2030, the EU is estimated to import more than 70% of vegetable oils and meals from the 12 FTA countries, while the EU exports to those regions represent only 13% of EU exports of these commodities. Consequently, the net trade of oil and meals shows a deficit versus the 12 FTA regions of more than EUR 12 billion in the baseline, which is further increased by EUR 286 million and EUR 660 million under the two scenarios. The oils and meals aggregate combines two different markets, the one of vegetable oils mainly for human consumption, and the one of oilcakes for animal feed, which is already largely liberalised. In the vegetable oil market Indonesia and Malaysia are main exporters, while oilcakes come mostly from Argentina and Brazil.

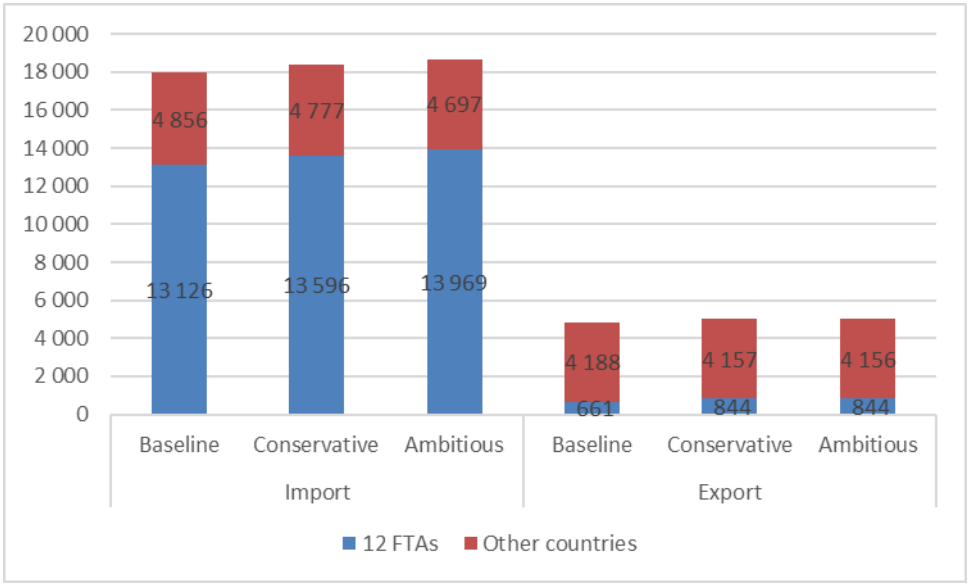
The Asian countries, such as Malaysia, Indonesia, and the Philippines, show a substantial increase of their exports towards the EU. The extent to which additional market access will be provided to Asian countries is crucial to determine the final impact on their imports to the EU. According to the current scenario definition, Indonesia will be able to expand their exports to the EU by EUR 86 million under the conservative and by

EUR 313 million under the ambitious scenario, while Malaysia might increase their exports by EUR 295 million or EUR 451 million, respectively.

The EU exports to the 12 FTA countries and regions also increase, particularly to Mercosur and Thailand.

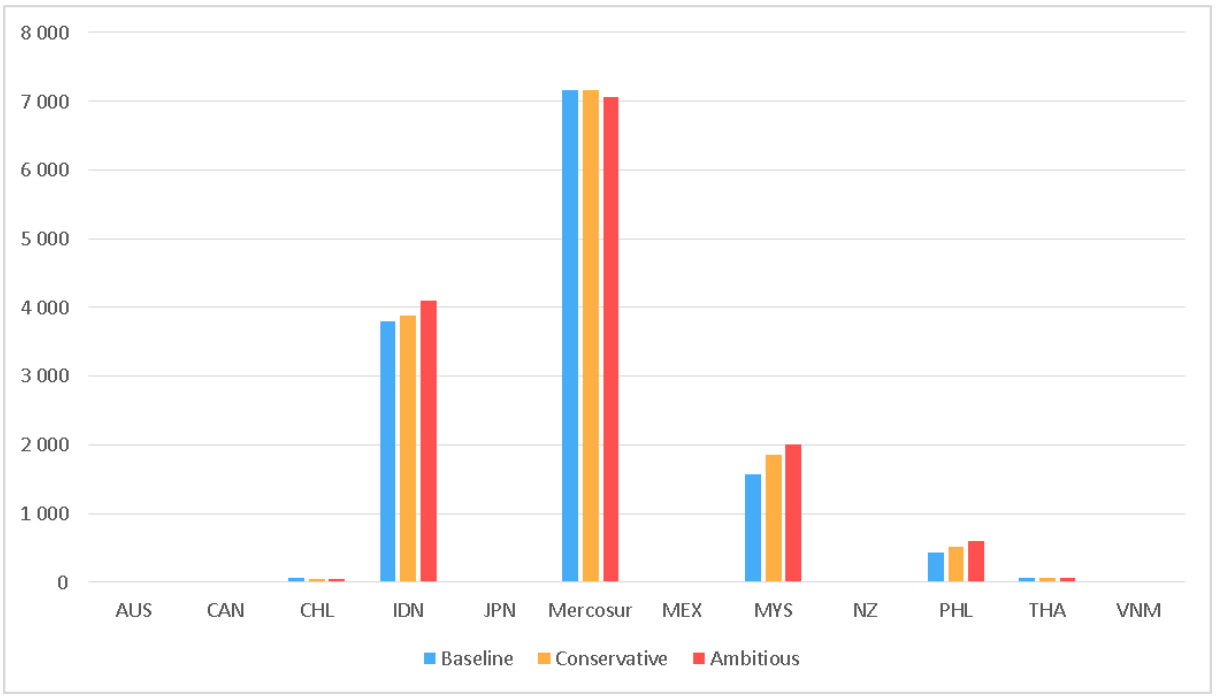
The final effect of the market access granted under the 12 FTAs shows a reduction of imports and exports from and to other countries (Figure 49).

Figure 49: EU vegetable oils and meals imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET results

Figure 50: EU imports of vegetable oils and meals from the 12 FTAs countries (2030, EUR million)



Source: Authors' calculation from MAGNET results

The market shares of the main exporters of oils and meals, despite the remarkable increase of exports from Indonesia, Malaysia, and the Philippines, are not affected by the trade liberalisation remaining stable along the different scenarios (Figure 50).

5.2.11 Beverages and tobacco

The Aglink-Cosimo model does not cover the beverages and tobacco sectors either. For this reason, all results related to these sectors come from the MAGNET model without the details provided by the Aglink-Cosimo model.

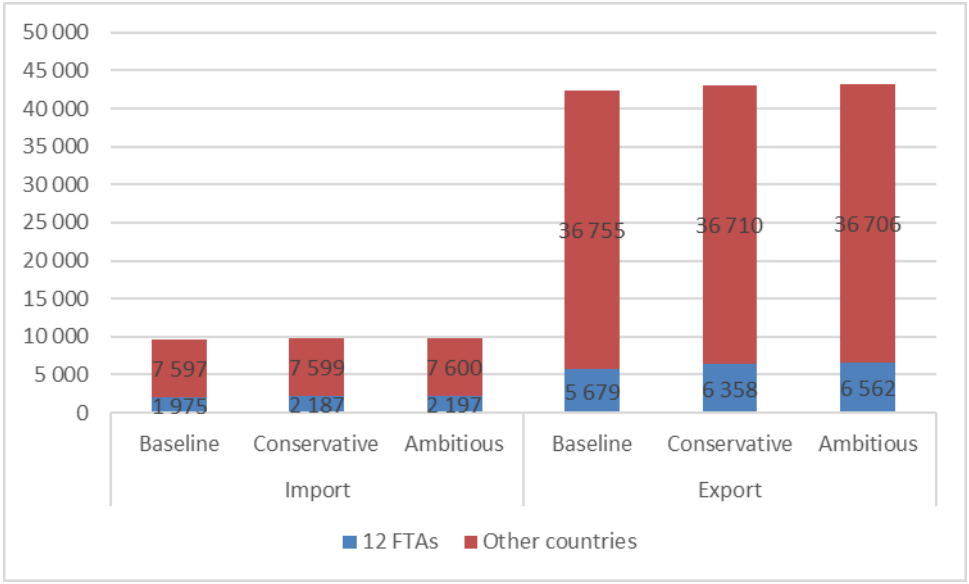
The strength and export orientation of the EU beverages sector is reflected in the results. Although small in percentage terms, the EU increases its production under both scenarios. The production growth under the ambitious scenario is around 0.7%.

In this sector, the EU trade relationships are mostly oriented towards other countries rather than the 12 FTAs, which represent only one fifth of EU imports and only 13% of the EU exports showing a positive net trade of EUR 3.7 billion.

The trade balance of the EU in beverages improves by 1.3% under the conservative and 1.9% under the ambitious scenario. The balance towards the 12 FTA partners improves more sharply, by around 13% and 18%, which means an improvement of between EUR 467 million and EUR 660 million (Table 27). Japan, Malaysia, Mercosur, and Vietnam show the largest export opportunities for the EU exports. Overall, EU exports to the 12 FTAs could increase by between EUR 679 million and EUR 883 million. The exports of the EU to the rest of the world decline slightly, by about EUR 45 million to EUR 49 million, causing an increase of overall exports of between 1.5% and 2% after the agreements.

The growth of EU exports to the FTA partners that have lower shares in the EU beverages exports such as Malaysia and Vietnam is higher. On the other hand, the shares of Canada and Japan in the EU exports do not change much, although they remain relatively high (Figure 61). Furthermore, although there is a significant growth in exports to Mercosur, the share is not affected significantly. On the import side, the highest increase is observed from Mercosur.

Figure 51: EU beverages and tobacco imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET results

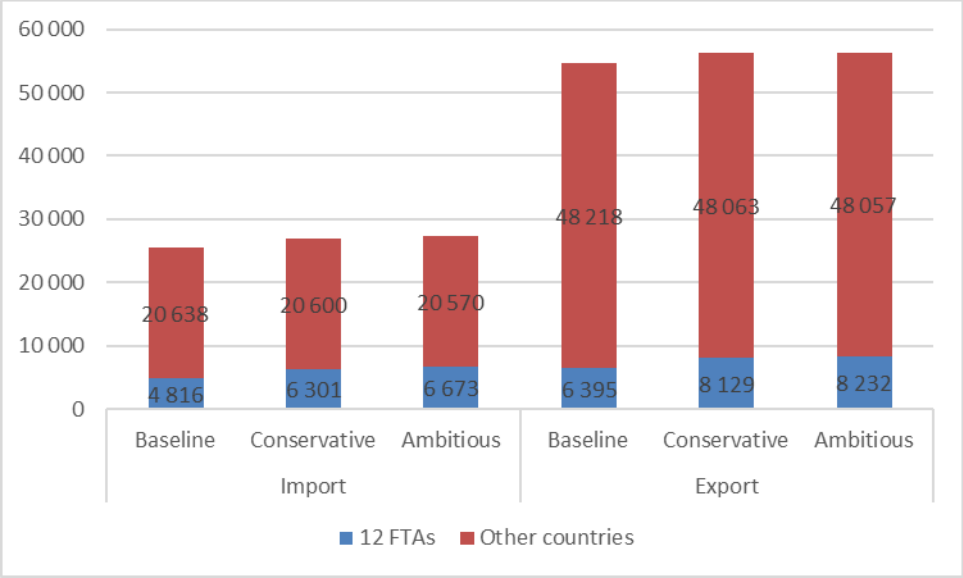
5.2.12 Other food

The 'other foods' aggregate is a large category, containing a variety of food preparations, prepared and preserved fruits and vegetables, fruit juices, starches, bakery products, cocoa, chocolate and sugar

confectionery, among others. Since the Aglink-Cosimo model does not cover these sectors, all results come from the MAGNET model, without the details provided by the Aglink-Cosimo model. Most of the other food aggregate is traded with countries outside of the 12 FTAs regions (more than 80% of imports and more than 88% of exports). For this reason, production and the overall trade position of the EU are not impacted sizeably in the analysed scenarios. Impacts on production are positive but almost negligible.

The initial positive trade balance with the 12 FTA regions improves by EUR 248 million under the conservative scenario while it falls by EUR 20 million under the ambitious one. Under the conservative scenario, the improvement of the balance versus Japan, Australia and Canada are almost compensated by a significant increase of imports from Mercosur and a decrease of trade balance. Under the ambitious one, a significant increase of imports from Thailand, corresponding to a large tariff cut, cause a deterioration of trade balance versus Thailand and a negative impact on the overall balance. Mercosur is the main exporter to the EU and the region benefitting the most of the trade agreement. The EU trade balance against the region deteriorates under both scenarios by EUR 590 million. On the other hand, Japan is the main importer of EU products and EU possibilities to export to Japan expand by around EUR 567 million.

Figure 52: EU other food imports and exports (2030, EUR million)



Source: Authors' calculation from MAGNET results

6 Conclusions

This report presents the cumulative impacts on the EU agricultural markets of a series of FTAs concluded or under negotiation between the EU (this study covers the EU27) and a set of 12 third countries/regions. The assessment is performed employing the MAGNET and Aglink-Cosimo models. MAGNET is a CGE model and analyses the economy-wide impacts of the trade policy changes involving all sectors of the regional blocks. Aglink-Cosimo is a PE model and quantifies the detailed impacts on individual agricultural commodity markets. The changes in agricultural imports and exports produced by MAGNET are introduced in Aglink-Cosimo in order to assess the impacts of these FTAs on EU prices, supply and demand.

Two counterfactual scenarios (conservative and ambitious) are compared to the reference (baseline) scenario in 2030. They explicitly include 12 FTAs recently concluded (Canada, Japan, Mercosur, Mexico, and Vietnam), under negotiation or possibly envisaged (Australia, Chile, Indonesia, Malaysia, New Zealand, the Philippines, and Thailand).

This report builds on a previous one performed by the JRC in 2016 (Boulanger et al., 2016). It fills a knowledge gap regarding the state of the EU agri-food sector in the light of further EU trade negotiations and agreements. In particular, it provides an accurate and realistic representation of all those agreements already concluded (through the explicit modelling of TRQs). Moreover, the report provides insights for policy makers and negotiators, as a contribution to finding a good balance in further trade liberalisation. However, the presented model-based approach does not reflect all subtleties within agricultural trade (including environmental, sanitary, or social regulations).

Results are largely consistent with the 2016 report (Boulanger et al. 2016), showing substantial opportunities for certain commodities: dairy, pork; wheat, wine and beverages while also underlying sensitivities for others such as beef, sheep, sugar, poultry, and rice. Despite the fact that the considered 12 FTAs have a higher share in EU imports compared to EU exports, the outcome in terms of overall trade balance is positive for the agri-food sector due to a higher increase in exports than imports.

The report clearly illustrates the potential for EU agricultural products on world markets. The potential gains for the dairy and pork sectors remain particularly large. Other products benefit from trade opening, ranging from commodities to more high value/processed products of the agri-food industry, such as wine and beverages. The additional export demand enhanced by trade agreements could translate into an important source of growth, jobs creation and value added for the European agricultural and food sectors.

Furthermore, the report confirms that growing imports of some products is to be expected following further market access opening. This is notably the case for beef, sheep meat, poultry, rice, and sugar. Regarding the beef market, this study shows a significant reduction in the magnitude of the negative impacts compared to the 2016 study. This can be explained by the implementation of a more realistic negotiated outcome based on TRQs for the most important trading partners, especially Mercosur, in addition to model and database differences between the two studies. This confirms the EU's concerns regarding the sensitive character of these products in trade negotiations and how the introduction of TRQs, which are commonly included in trade agreements for these sectors, could reduce the negative impacts on the EU markets.

In any event, the successful conclusion of trade agreements will have to strike a balance between the protection of sensitive products and the achieved market access for EU agricultural products if the overall result of trade negotiations is to remain economically and socially acceptable for the EU agriculture.

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List of abbreviations and definitions

ASEAN	Association of South-East Asian Nations
AUS	Australia
AVE	*ad valorem* equivalent
CAN	Canada
CETA	Comprehensive Economic and Trade Agreement
CGE	computable general equilibrium
CHL	Chile
DFQF	duty-free, quota-free
FAO	Food and Agriculture Organization of the United Nations
FTA	free trade agreement
GDP	gross domestic product
GTAP	Global Trade Analysis Project
HS	Harmonised System (tariff nomenclature)
IDN	Indonesia
iMAP	integrated Modelling Platform for Agro-economic Commodity and Policy Analysis
ITC	International Trade Centre
JPN	Japan
JRC	Joint Research Centre
MAGNET	Modular Applied GeNeral Equilibrium Tool
MAL	Malaysia
MENA	Middle East and North Africa
Mercosur	Southern Common Market
MIDAS	Modelling Inventory Database and Access Services
MoU	memorandum of understanding
NTM	non-tariff measure
NZ	New Zealand
MEX	Mexico
OECD	Organisation for Economic Co-operation and Development
PHN	Philippines
PE	partial equilibrium
RoAm	Rest of America
RoAs	Rest of Asia
RoE	Rest of Europe
RoW	Rest of the World
SDGs	sustainable development goals
SIA	sustainability impact asssments
SSA	Sub-Saharan Africa
TASTE	Tariff Analytical and Simulation Tool for Economists

THA	Thailand
TRQ	tariff rate quota
UK	United Kingdom
USA	United States of America
VNM	Vietnam
WTO	World Trade Organisation

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Annexes

Annex 1. Methodology: Tables and Figures

Table 8: Detailed sectoral list

Number	GTAP code	Description
1	Paddy rice	Rice, husked and unhusked
2	Wheat	Wheat and meslin
3	Other grains	Maize (corn), barley, rye, oats, other cereals
4	Vegetables and Fruit	Vegetables, fruits, nuts, potatoes, cassava, truffles,
5	Oilseeds	Oil seeds and oleaginous fruit; soy beans, copra
6	Cane and beet:	Sugar cane and sugar beet
7	Fibres crops	Fibres crops
8	Wool	Wool, silk, and other raw animal materials used in textile
9	Other Crops	Live plants; cut flowers and flower buds; flower seeds and fruit seeds; vegetable seeds, beverage and spice crops, unmanufactured tobacco, cereal straw and husks, unprepared, whether or not chopped, ground, pressed or in the form of pellets; swedes, mangolds, fodder roots, hay, lucerne (alfalfa), clover, sainfoin, forage kale, lupines, vetches and similar forage products, whether or not in the form of pellets, plants and parts of plants used primarily in perfumery, in pharmacy, or for insecticidal, fungicidal or similar purposes, sugar beet seed and seeds of forage plants, other raw vegetable materials
10	Cattle	Cattle
11	Sheep: Approximation for sheep live animals	Sheep, goats, horses, asses, mules, and hinnies; and semen thereof
12	Poultry live animals	Poultry
13	Other Animal Products: approximation for pig live animals	Swine and other live animals; eggs, in shell (fresh or cooked), natural honey, snails (fresh or preserved) except sea snails; frogs' legs, edible products of animal origin n.e.c., hides, skins and furskins, raw , insect waxes and spermaceti, whether or not refined or coloured
14	Raw milk	Raw milk
15	Beef	Fresh or chilled meat and edible offal of cattle.
16	Sheep meat: approximation for sheep meat	Fresh or chilled meat and edible offal of sheep, goats, horses, asses, mules, and hinnies. raw fats or grease from any animal or bird.
17	Poultry meat: approximation for poultry	Preserves and preparations of meat, meat offal or blood, flours, meals and pellets of meat or inedible meat offal; greaves
18	Pork	Pig meat and offal.
19	Oils and measl	Crude and refined oils of soya-bean, maize (corn),olive, sesame, ground-nut, olive, sunflower-seed, safflower, cotton-seed, rape, colza and canola, mustard, coconut palm, palm kernel, castor, tung jojoba, babassu and linseed, perhaps partly or wholly hydrogenated, inter-esterified, re-esterified or elaidinised. Also margarine and similar preparations, animal or vegetable waxes, fats and oils and their fractions, cotton linters, oil-cake and other solid residues resulting from the extraction of vegetable fats or oils; flours and meals of oil seeds or oleaginous fruits, except those of mustard; degras and other residues resulting from the treatment of fatty substances or animal or vegetable waxes.
20	Dairy	Milk: dairy products
21	Rice	Rice, semi- or wholly milled
22	Sugar	Sugar
23	Other Food	Prepared and preserved vegetables, pulses and potatoes; prepared and preserved fruits and nuts; wheat and meslin flour; other cereal flours; groats, meal and pellets of wheat and other cereals; other cereal grain products (including corn flakes); other vegetable flours and meals; mixes and doughs for the preparation of bakers' wares; starches and starch products; sugars and sugar syrups n.e.c.; preparations used in animal feeding; lucerne (alfalfa) meal and pellets; bakery products; cocoa, chocolate and sugar confectionery; macaroni, noodles, couscous and similar farinaceous products; food products n.e.c.
24	Beverages and tobacco	Beverages and tobacco products

Source: Adapted from Aguiar et al., (2019) (https://www.gtap.agecon.purdue.edu/databases/contribute/detailedsector.asp).

Table 9: Detailed countries/regions list

Number	GTAP code	Name	Description
1	EU	EU	Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden
2	AUS	Australia	Australia
3	CAN	Canada	Canada
4	IDN	Indonesia	Indonesia
5	JPN	Japan	Japan
6	MERC	Mercosur	Argentina, Brazil, Paraguay, Uruguay
7	MEX	Mexico	Mexico
8	NZL	New Zealand	New Zealand
9	PHL	Philippines	Philippines
10	THA	Thailand	Thailand
11	CHL	Chile	Chile
12	MYS	Malaysia	Malaysia
13	VNM	Vietnam	Vietnam
12	USA	United States of America	United States
13	RoE	Rest of Europe	Switzerland, Norway, rest of the European Free Trade Association, Albania, Belarus, Russia, United Kingdom, rest of eastern Europe, rest of Europe
14	RoAm	Rest of Americas	Rest of North America, Bolivia, Colombia, Ecuador, Venezuela, Peru, rest of South America, Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El Salvador, rest of Central America, Dominican Republic, Jamaica, Puerto Rico, Trinidad and Tobago, Caribbean
15	RoAs	Rest of Asia	China, Hong Kong, South Korea, Mongolia, Taiwan, rest of East Asia, Brunei, Cambodia, Laos, Singapore, Rest of South-East Asia, Bangladesh, India, Nepal, Pakistan, Sri Lanka, rest of South Asia
16	MENA	Middle East and North Africa	Bahrain, Iran, Israel, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates, rest of western Asia, Egypt, Morocco, Tunisia, rest of North Africa
17	SSA	Sub-Saharan Africa	Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Ghana, Guinea, Nigeria, Senegal, Togo, rest of western Africa, rest of Central Africa, rest of South Central Africa, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe, rest of eastern Africa, Botswana, Namibia, South Africa, rest of South African Customs Union
18	RoW	Rest of the world	Rest of Oceania, Kazakhstan, Kyrgyzstan, Tajikistan, rest of former Soviet Union, Armenia, Azerbaijan, Georgia, rest of the world

Source: Adapted from Aguiar et al., (2019) (https://www.gtap.agecon.purdue.edu/databases/regions.aspx?version=10.211)

Table 10: Macroeconomic baseline assumptions (2014-2030, US dollars, %)

	Population growth % (EU)	Real GDP growth % (EU)	Oil price (USD per barrel Brent)
2014	0.33	1.7	99
2015	0.29	2.3	52
2016	0.28	2.0	44
2017	0.22	2.6	55
2018	0.21	2.0	71
2019	0.22	1.4	65
2020	0.22	1.4	62
2021	0.23	1.4	62
2022	0.03	1.3	64
2023	0.00	1.4	67
2024	-0.01	1.5	69
2025	-0.02	1.5	71
2026	-0.03	1.5	73
2027	-0.03	1.5	75
2028	-0.04	1.4	77
2029	-0.05	1.4	80
2030	-0.06	1.4	83

Sources: DG Agriculture and Rural Development estimates based on the European Commission macroeconomic forecasts and IHS Global Insight.

Annex 2. Overview: Tables and Figures

Table 11: EU agri-food imports and share in total agri-food imports by trading partners and scenarios (2030, EUR million, %)

	Baseline		Conservative		Ambitious	
	Exports	**%**	**Exports**	**%**	**Exports**	**%**
AUS	1 175	1.0	1 265	1.1	1 421	1.2
CAN	2 384	2.1	2 519	2.2	2 514	2.1
CHL	1 912	1.7	1 930	1.7	1 965	1.7
IDN	4 780	4.2	4 982	4.3	5 215	4.4
JPN	195	0.2	278	0.2	276	0.2
Mercosur	20 385	18.1	22 631	19.5	22 507	19.2
MEX	800	0.7	915	0.8	914	0.8
MYS	1 761	1.6	2 119	1.8	2 282	1.9
NZ	1 250	1.1	1 375	1.2	1 495	1.3
PHL	714	0.6	826	0.7	944	0.8
THA	1 487	1.3	1 791	1.5	2 304	2.0
VNM	1 960	1.7	2 112	1.8	2 113	1.8
FTA	**38 808**	**34.4**	**42 748**	**36.7**	**43 956**	**37.5**
USA	8 770	7.8	8 747	7.5	8 718	7.4
UKR	5 249	4.7	5 230	4.5	5 202	4.4
RoE	22 369	19.9	22 282	19.2	22 227	18.9
RoAm	6 544	5.8	6 521	5.6	6 514	5.6
RoAS	8 423	7.5	8 410	7.2	8 374	7.1
MENA	10 548	9.4	10 498	9.0	10 477	8.9
SSA	10 589	9.4	10 560	9.1	10 547	9.0
ROW	1 369	1.2	1 355	1.2	1 341	1.1
Total	**112 672**	**100**	**116 354**	**100**	**117 360**	**100**

Source: Authors' calculation from MAGNET results

Table 12: EU imports by commodities, origins, and scenarios (2030, EUR million)

	12 FTA partners				Other				Total			
	Conservative		Ambitious		Conservative		Ambitious		Conservative		Ambitious	
	%	mil. EUR	%	mil. EUR	%	mil. EUR	%	mil. EUR	%	mil. EUR	%	mil. EUR
Wheat	0.6	654.6	0.6	654.7	0.6	603.1	0.7	603.3	0.6	1 257.7	0.6	1 258.0
Other Cereals	1.6	996.8	1.8	997.9	-0.1	4 096.6	-0.1	4 095.7	0.3	5 093.4	0.3	5 093.6
Rice	14.3	398.1	30.7	455.2	-1.7	1 022.4	-5.9	979.4	2.3	1 420.5	3.3	1 434.6
Oilseeds	0.0	6 228.2	-0.3	6 204.1	0.3	4 247.0	-0.1	4 233.1	0.1	10 475.2	-0.2	10 437.2
Oils and Meals	3.6	13 595.8	6.4	13 968.8	-1.6	4 776.9	-3.3	4 696.6	2.2	18 372.7	3.8	18 665.4
Sugar	75.3	298.4	79.6	305.8	-2.2	722.4	-2.3	721.7	12.3	1 020.8	13.0	1 027.4
Fruits and Vegetables	9.3	3 467.6	10.4	3 503.5	-0.8	13 695.0	-1.0	13 674.0	1.1	17 162.6	1.2	17 177.5
Other Crops	1.7	3 803.9	1.9	3 813.6	0.3	9 420.3	0.4	9 422.4	0.7	13 224.1	0.8	13 235.9
Beef	44.2	1 785.6	53.0	1 894.6	-3.1	1 132.5	-3.6	1 125.7	21.3	2 918.0	25.5	3 020.3
Sheep meat	3.4	604.8	6.5	623.2	0.1	437.0	-0.4	434.9	2.0	1 041.8	3.6	1 058.1
Pork	77.4	59.0	123.0	74.2	1.0	412.1	1.1	412.6	6.7	471.1	10.3	486.8
Poultry	37.2	1 589.3	49.7	1 733.8	-2.8	708.2	-3.9	700.6	21.8	2 297.6	29.0	2 434.4
Dairy	108.1	97.9	252.5	165.9	1.3	1 794.1	1.2	1 792.3	4.0	1 892.0	7.7	1 958.2
Other food	30.8	6 300.9	38.6	6 672.6	-0.2	20 599.6	-0.3	20 569.7	5.7	26 900.4	7.0	27 242.3
Bev and Tobacco	10.7	2 186.6	11.3	2 197.3	0.0	7 599.3	0.0	7 600.3	2.2	9 785.9	2.4	9 797.6

NB: values represent import values in 2030.

Source: Authors' calculation from MAGNET results

Table 13: EU exports by trading partners and scenarios (2030, EUR million, %)

	Baseline		Conservative		Ambitious	
	Exports	**%**	**Exports**	**%**	**Exports**	**%**
AUS	2 802	1.7	2 956	1.7	2 982	1.7
CAN	4 163	2.5	4 401	2.6	4 399	2.5
CHL	444	0.3	445	0.3	450	0.3
IDN	736	0.4	896	0.5	915	0.5
JPN	5 314	3.2	7 401	4.3	7 398	4.3
Mercosur	1 469	0.9	2 180	1.3	2 180	1.3
MEX	1 177	0.7	1 570	0.9	1 570	0.9
MYS	868	0.5	976	0.6	1 165	0.7
NZ	524	0.3	561	0.3	571	0.3
PHL	1 832	1.1	2 120	1.2	2 500	1.4
THA	637	0.4	1 177	0.7	1 348	0.8
VNM	1 084	0.6	1 592	0.9	1 591	0.9
FTA	**21 058**	**12.59**	**26 281**	**15.29**	**27 073**	**15.68**
USA	18 374	11.0	18 290	10.6	18 286	10.6
UKR	1,943	1.2	1 939	1.1	1 938	1.1
RoE	61 697	36.9	61 566	35.8	61 570	35.7
RoAm	2,944	1.8	2 926	1.7	2 925	1.7
RoAS	20 784	12.4	20 627	12.0	20 620	11.9
MENA	25 088	15.0	24 993	14.5	24 992	14.5
SSA	11 765	7.0	11 729	6.8	11 727	6.8
ROW	3 571	2.1	3 559	2.1	3 558	2.1
Total	**167 227**	**100**	**171 914**	**100**	**172 691**	**100**

NB: values represent import values in 2030.

Source: Authors' calculation from MAGNET results.

Table 14: EU exports by commodities, origins, and scenarios (2030, EUR million)

	12 FTA partners				Other				Total			
	Conservative		Ambitious		Conservative		Ambitious		Conservative		Ambitious	
	%	mil. EUR	%	mil. EUR	%	mil. EUR	%	mil. EUR	%	mil. EUR	%	mil. EUR
Wheat	29.9	68.9	29.9	68.9	-0.4	6 675.4	-0.4	6 674.9	-0.1	6,744.2	-0.1	6 743.7
Other Cereals	0.5	54.3	0.6	54.3	-0.1	2 130.8	-0.1	2 130.5	-0.1	2 185.0	-0.1	2 184.9
Rice	40.9	37.5	42.0	37.8	-0.3	302.3	0.7	305.2	3.1	339.8	4.0	343.0
Oilseeds	5.6	1.4	5.9	1.4	0.2	55.3	0.0	55.2	0.4	56.8	0.2	56.7
Oils and Meals	27.7	844.1	27.6	843.6	-0.7	4 156.8	-0.8	4 155.5	3.1	5 000.9	3.1	4 999.1
Sugar	26.7	63.6	27.6	64.0	-0.2	1 563.4	-0.2	1 562.5	0.7	1 627.0	0.6	1 626.5
Fruits and Vegetables	17.4	478.1	17.6	479.0	0.0	6 830.1	0.1	6 831.2	1.0	7 308.1	1.1	7 310.2
Other Crops	21.2	548.2	26.6	572.7	-0.6	4 189.9	-0.6	4 187.5	1.5	4 738.2	2.0	4 760.2
Beef	84.3	304.6	112.5	351.2	-0.3	2 616.4	-0.2	2 616.6	4.8	2 921.0	6.4	2 967.8
Sheep meat	22.5	16.8	22.7	16.9	-0.8	180.3	-0.6	180.6	0.9	197.1	1.0	197.4
Pork	28.4	3 344.1	38.1	3 597.4	-0.9	7 644.0	-1.0	7 635.1	6.5	10 988.1	8.9	11 232.6
Poultry	37.0	449.1	54.8	507.5	-0.5	3 810.8	-0.2	3 820.2	2.5	4 259.9	4.1	4 327.7
Dairy	46.2	4 284.8	48.9	4 365.1	-0.9	14 665.0	-1.0	14 661.6	6.9	18 949.9	7.3	19 026.7
Other food	27.1	8 128.6	28.7	8 232.0	-0.3	48 062.8	-0.3	48 057.1	2.9	56 191.5	3.1	56 289.1
Bev and Tobacco	12.0	6 358.3	15.5	6 562.1	-0.1	36 709.9	-0.1	36 706.2	1.5	43 068.2	2.0	43 268.3

NB : values represent import values in 2030, % shows change of import value compared to baseline in 2030

Source: Authors' calculation from MAGNET results.

Table 15: EU trade balance with 12 FTA partners by commodities and scenarios (2030, EUR million)

Balance	Absolute values				
	Baseline	Conservative	Ambitious	CONS-BASE	AMBI-BASE
Wheat	-598	-586	-586	12	12
Other Cereals	-927	-943	-944	-16	-17
Rice	-322	-361	-417	-39	-96
Oilseeds	-6 224	-6 227	-6 203	-3	22
Oils and Meals	-12 465	-12 752	-13 125	-286	-660
Sugar	-120	-235	-242	-115	-122
Fruits and Vegetables	-2 766	-2 990	-3 025	-223	-258
Other Crops	-3 289	-3 256	-3 241	34	49
Beef	-1 073	-1 481	-1 543	-408	-471
Sheep meat	-571	-588	-606	-17	-35
Pork	2 571	3 285	3 523	714	952
Poultry	-830	-1 140	-1 226	-310	-396
Dairy	2 884	4 187	4 199	1 302	1 315
Bev and Tobacco	3 704	4 172	4 365	467	660
Other food	518	475	488	-43	-30
Total	1 579	1 828	1 559	248	-20

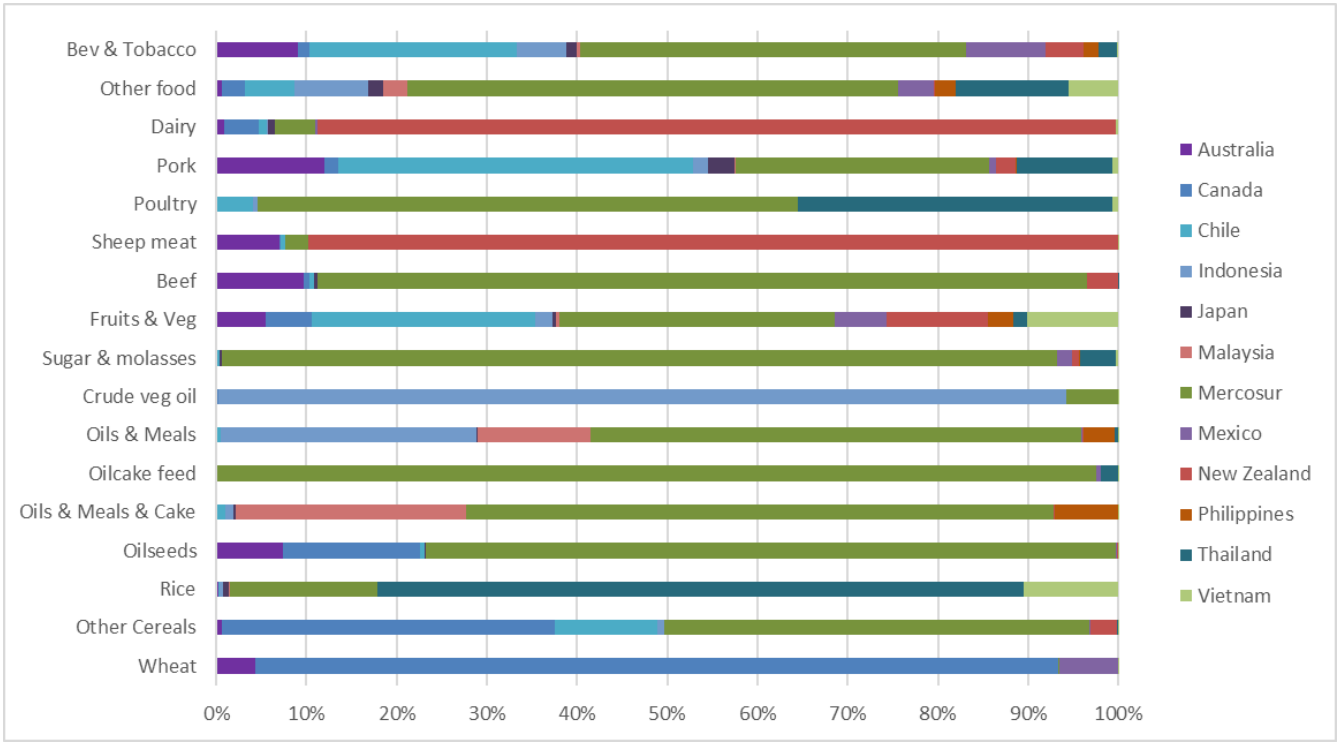
Source: Authors' calculation from MAGNET results

Table 16: Composition of EU production, imports and exports by commodities, baseline (2030, %)

	Share in total production	Share in total imports	Share in total exports
Wheat	1.88	1.29	4.54
Other Cereals	1.84	3.95	0.61
Fruits and Vegetables	5.06	17.95	4.97
Other Crops	4.3	13.4	3.3
Oilseeds	0.63	11.65	0.03
Beef	6.57	2.69	2.03
Poultry	6.06	2.16	2.98
Sheep meat	1.13	1.50	0.67
Pork	11.05	2.31	9.27
Oils and Meals	4.06	18.96	4.97
Dairy	20.61	2.04	12.03
Rice	0.45	1.48	0.22
Sugar	2.20	1.37	0.98
Other food	25.28	15.91	29.64
Bev and Tobacco	8.84	3.37	23.77

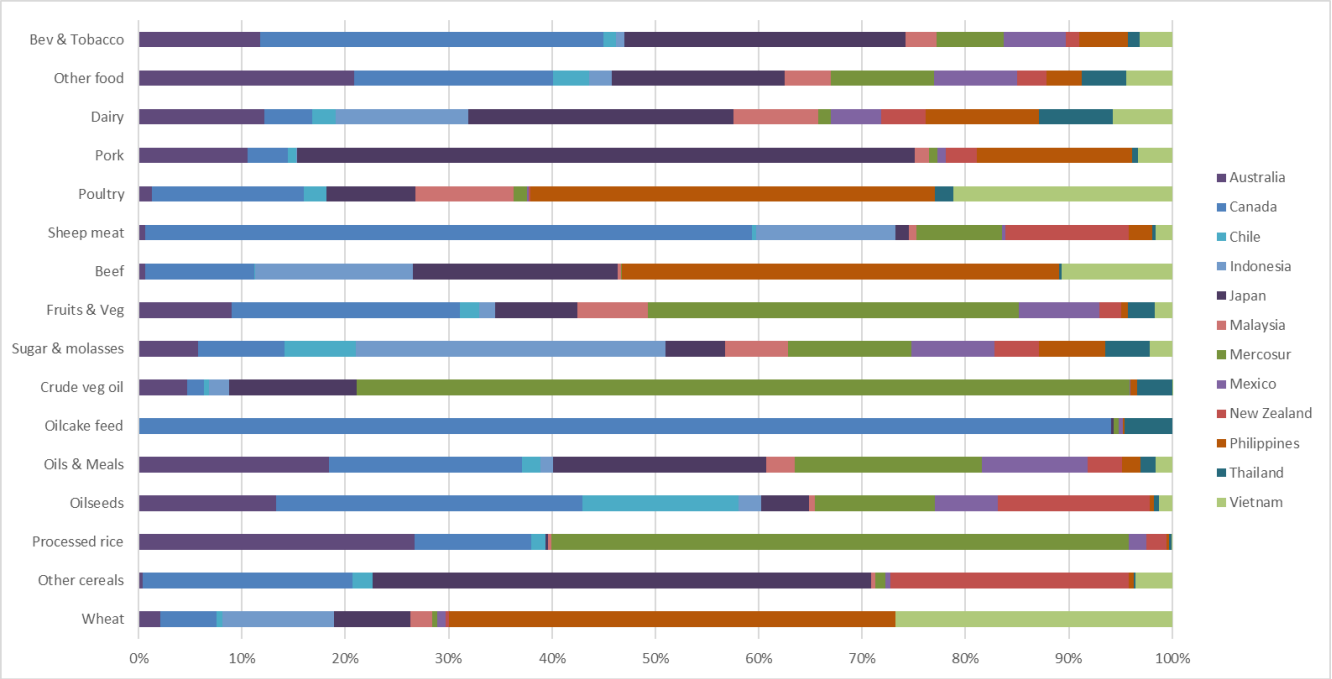
Source: Authors' calculation from MAGNET results

Figure 53: EU import shares by FTA partners and commodities, baseline (2030, %)



Source: Authors' calculation from MAGNET results

Figure 54: EU export shares by FTA partners and commodities, baseline (2030, %)



Source: Authors' calculation from MAGNET results

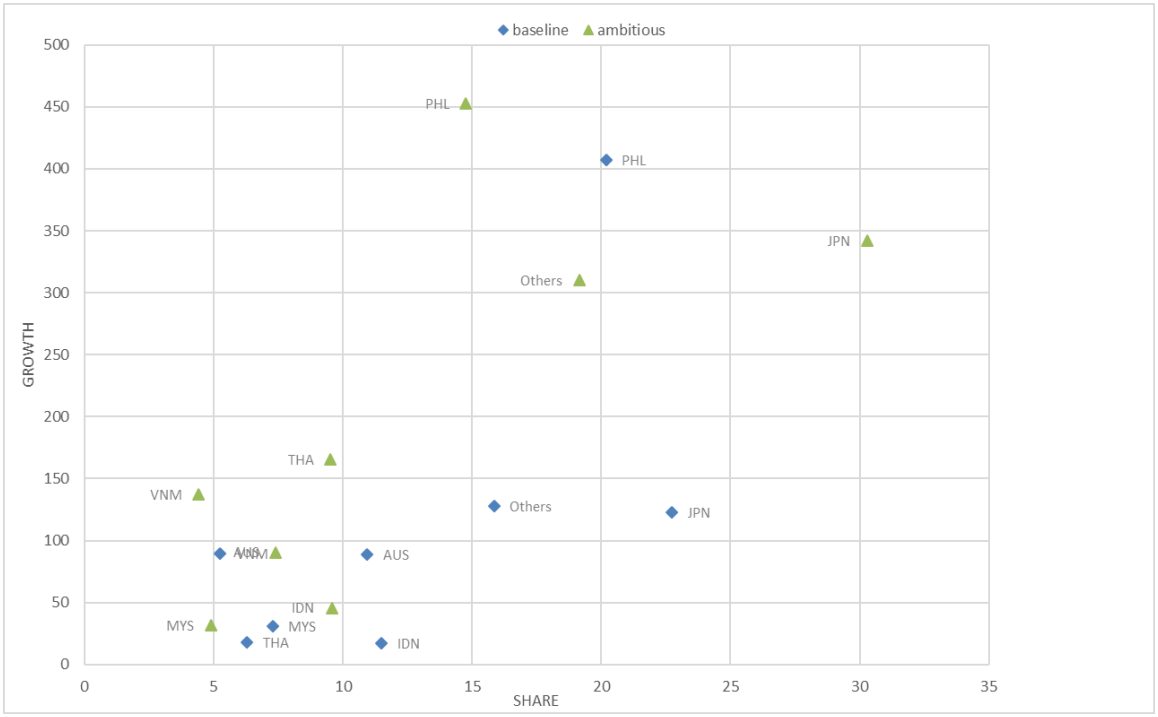
Annex 3. Focus on specific sectors: Tables and Figures

Table 17: Dairy EU imports, exports, and balance, by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	0.4	0.6	1.0	320.4	319.3	323.4	320.0	318.7	322.4
CAN	1.8	6.7	6.7	130.0	195.5	195.4	128.3	188.8	188.7
CHL	0.4	0.4	0.4	59.2	59.7	61.2	58.8	59.3	60.8
IDN	0.1	2.0	2.0	336.6	417.1	417.7	336.6	415.1	415.7
JPN	0.6	3.2	3.2	666.1	1 322.3	1 321.7	665.6	1 319.2	1 318.5
Mercosur	2.2	7.3	7.3	35.8	72.2	72.1	33.6	64.9	64.9
MEX	0.1	0.5	0.5	126.3	379.2	378.6	126.2	378.8	378.2
MYS	0.3	0.3	0.4	213.3	211.5	213.8	213.0	211.2	213.5
NZ	39.9	75.0	142.6	113.3	127.9	128.1	73.4	52.9	- 14.5
PHL	0.0	0.0	0.0	591.8	646.1	644.5	591.8	646.1	644.4
THA	1.2	1.2	1.2	184.6	341.1	415.8	183.4	339.9	414.6
VNM	0.1	0.7	0.7	154.0	192.7	192.8	153.9	192.1	192.1
12 FTAs	47.0	97.9	165.9	2 931.5	4 284.8	4 365.1	2 884.5	4 186.9	4 199.2
Other countries	1 771.5	1 794.1	1 792.3	14 803.0	14 665.0	14 661.6	13 031.5	12 871.0	12 869.3
Total	1 818.6	1 892.0	1 958.2	17 734.5	18 949.9	19 026.7	15 915.9	17 057.9	17 068.5

Source: Authors' calculation from MAGNET results

Figure 55: Growth of the EU exports to selected FTA partners (in % from 2020-2030) and their share in the EU exports for dairy products (%)



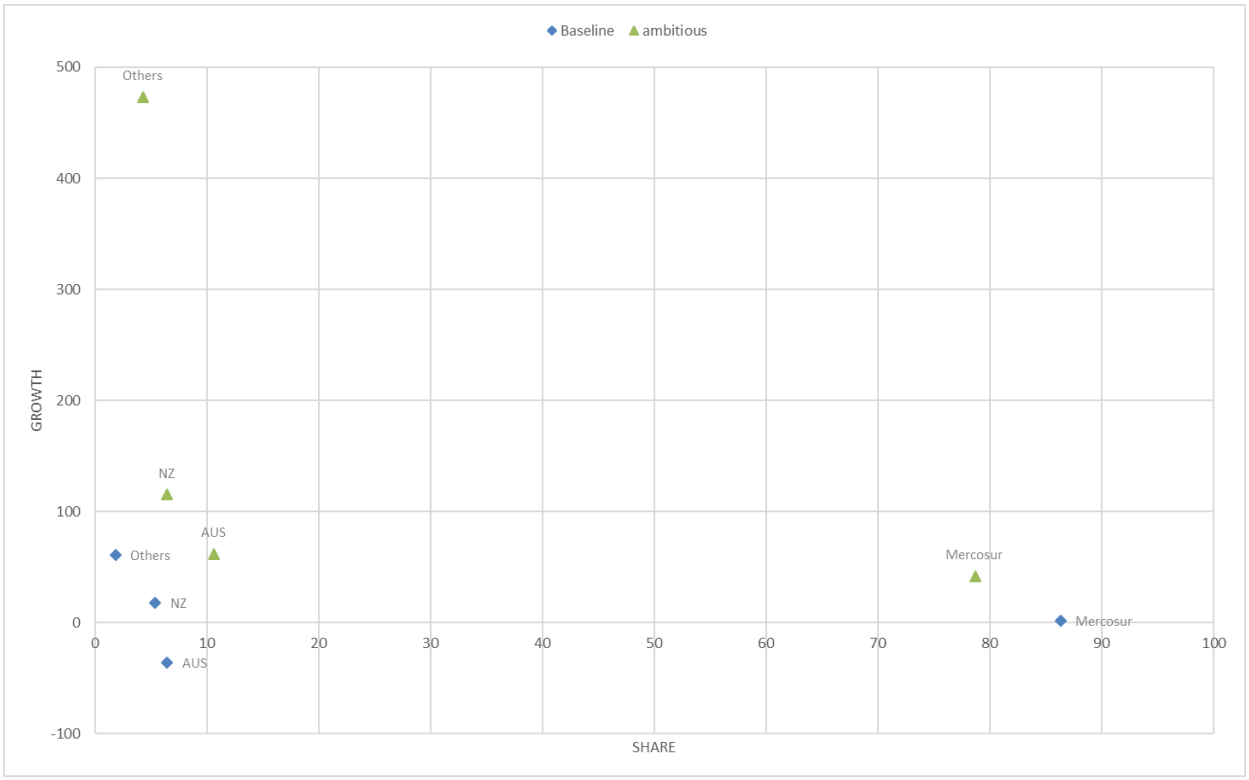
Source: Authors' calculation from MAGNET results

Table 18: Beef EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	79.9	125.2	201.0	1.0	1.0	1.0	- 78.8	- 124.2	- 200.0
CAN	9.2	29.3	29.1	17.3	17.2	17.2	8.1	- 12.1	- 11.9
CHL	7.4	7.1	7.0	0.0	0.0	0.0	- 7.4	- 7.1	- 7.0
IDN	0.0	0.0	0.0	25.0	35.5	35.7	25.0	35.5	35.7
JPN	5.8	40.6	40.2	32.2	122.8	123.0	26.5	82.2	82.7
Mercosur	1 068.7	1 490.3	1 490.6	0.2	0.4	0.4	-1 068.5	-1 489.9	-1 490.2
MEX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MYS	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5
NZ	66.6	88.2	121.9	0.0	0.0	0.0	- 66.6	- 88.1	- 121.9
PHL	0.0	0.0	0.0	70.8	85.5	131.8	70.8	85.5	131.8
THA	0.4	4.8	4.8	0.4	3.0	3.0	0.0	- 1.8	- 1.7
VNM	0.0	0.0	0.0	17.8	38.6	38.5	17.8	38.6	38.5
12 FTAs	1 237.9	1 785.6	1 894.6	165.3	304.6	351.2	-1 072.6	-1 481.0	-1 543.4
Other countries	1 168.3	1 132.5	1 125.7	2 623.1	2 616.4	2 616.6	1 454.8	1 483.9	1 490.9
Total	2 406.2	2 918.0	3 020.3	2 788.4	2 921.0	2 967.8	382.2	2.9	- 52.5

Source: Authors' calculation from MAGNET results

Figure 56: Growth of the EU imports from selected FTA partners (in % from 2020 to 2030) and their share in the EU imports for beef (%)



Source: Authors' calculation from MAGNET results

Table 19: Sheep meat EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	41.3	57.2	79.3	0.1	0.1	0.1	- 41.2	- 57.2	- 79.2
CAN	0.5	0.5	0.5	8.0	8.6	8.6	7.6	8.1	8.1
CHL	3.1	3.1	3.1	0.1	0.1	0.1	- 3.0	- 3.1	- 3.0
IDN	0.0	0.2	0.2	1.9	2.7	2.7	1.8	2.4	2.5
JPN	0.1	0.6	0.6	0.2	0.2	0.2	0.1	- 0.4	- 0.4
Mercosur	15.3	15.3	15.2	1.1	2.2	2.2	- 14.1	- 13.1	- 13.0
MEX	0.2	0.2	0.2	0.0	0.1	0.1	- 0.1	- 0.1	- 0.1
MYS	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
NZ	524.7	527.5	524.0	1.6	1.6	1.6	- 523.1	- 525.9	- 522.3
PHL	0.0	0.0	0.0	0.3	0.4	0.4	0.3	0.4	0.4
THA	0.0	0.0	0.0	0.1	0.4	0.4	0.1	0.4	0.4
VNM	0.0	0.1	0.1	0.2	0.4	0.4	0.2	0.4	0.4
12 FTAs	585.1	604.8	623.2	13.7	16.8	16.9	- 571.4	- 588.0	- 606.4
Other countries	436.5	437.0	434.9	181.7	180.3	180.6	- 254.8	- 256.7	- 254.3
Total	1 021.6	1 041.8	1 058.1	195.4	197.1	197.4	- 826.2	- 844.7	- 860.7

Source: Authors' calculation from MAGNET results

Table 20: Poultry EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	0.0	0.1	0.1	4.1	4.1	4.1	4.1	4.0	4.0
CAN	0.3	0.6	0.6	48.3	47.8	47.8	47.9	47.2	47.3
CHL	46.4	59.9	78.5	7.1	7.0	7.1	- 39.3	- 52.9	- 71.4
IDN	6.5	8.5	17.2	0.0	0.0	0.0	- 6.5	- 8.5	- 17.2
JPN	0.1	0.3	0.3	28.4	47.3	47.6	28.3	47.0	47.3
Mercosur	690.1	988.8	978.5	4.5	10.2	10.1	- 685.6	- 978.7	- 968.4
MEX	0.0	0.0	0.0	0.6	1.9	1.9	0.6	1.9	1.9
MYS	0.0	0.0	0.0	31.3	39.1	49.0	31.3	39.1	49.0
NZ	0.5	1.1	1.1	0.3	0.3	0.3	- 0.3	- 0.8	- 0.8
PHL	0.0	0.0	0.0	128.3	165.7	213.6	128.3	165.7	213.6
THA	406.3	507.3	635.2	6.0	19.5	19.7	- 400.3	- 487.9	- 615.5
VNM	7.9	22.7	22.4	69.0	106.1	106.1	61.1	83.5	83.7
12 FTAs	1 158.2	1 589.3	1 733.8	327.8	449.1	507.5	- 830.3	-1 140.3	-1 226.4
Other countries	728.9	708.2	700.6	3 829.6	3 810.8	3 820.2	3 100.6	3 102.6	3 119.6
Total	1 887.1	2 297.6	2 434.4	4 157.4	4 259.9	4 327.7	2 270.3	1 962.3	1 893.3

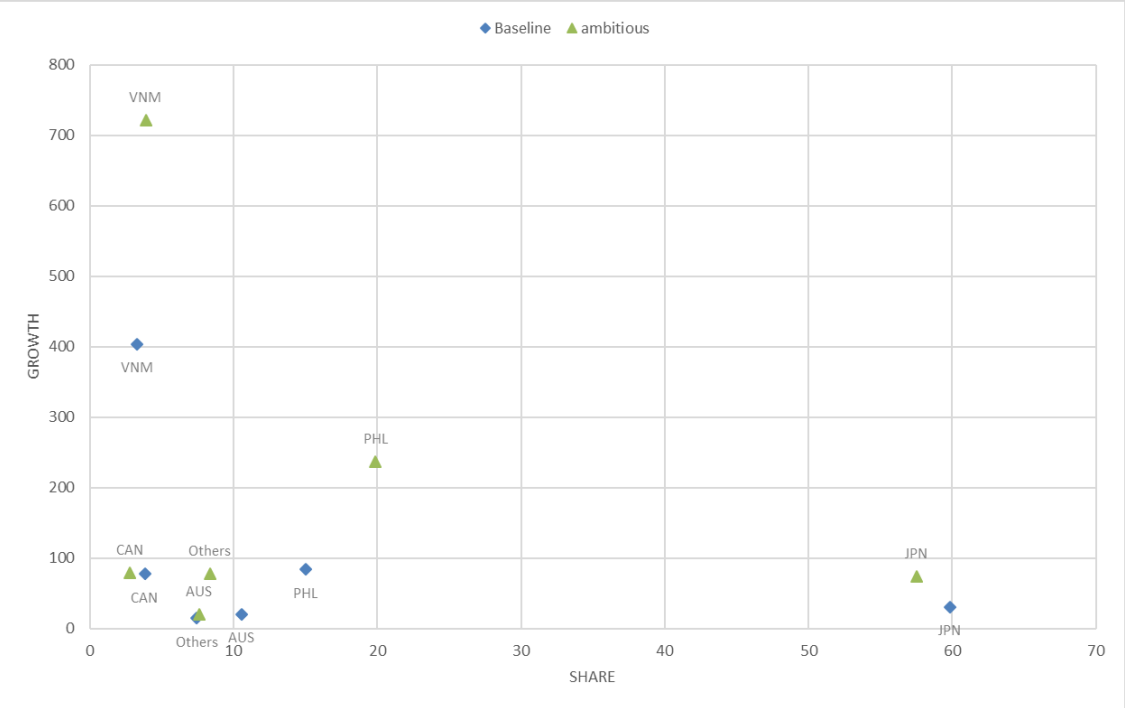
Source: Authors' calculation from MAGNET results

Table 21: Pork EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	4.0	6.1	20.4	274.5	273.5	273.2	270.5	267.5	252.7
CAN	0.5	2.1	2.1	100.1	100.9	100.7	99.6	98.8	98.6
CHL	13.1	13.4	13.3	22.1	21.7	21.7	9.0	8.4	8.4
IDN	0.5	0.7	1.5	1.5	1.6	2.2	0.9	0.9	0.7
JPN	1.0	4.7	4.7	1 558.5	2 070.8	2 068.5	1 557.5	2 066.2	2 063.9
Mercosur	9.4	18.3	18.3	20.8	44.2	44.1	11.5	25.9	25.8
MEX	0.2	0.2	0.2	21.9	41.4	41.4	21.7	41.2	41.2
MYS	0.0	0.1	0.1	35.4	35.3	35.9	35.3	35.2	35.8
NZ	0.7	2.3	2.3	77.3	81.0	85.6	76.6	78.6	83.3
PHL	0.0	0.1	0.1	391.0	499.9	714.6	391.0	499.8	714.5
THA	3.5	10.0	10.0	15.0	33.5	69.3	11.4	23.5	59.2
VNM	0.2	1.1	1.1	86.0	140.3	140.2	85.8	139.2	139.1
12 FTAs	33.3	59.0	74.2	2 604.1	3 344.1	3 597.4	2 570.9	3 285.1	3 523.3
Other countries	408.2	412.1	412.6	7 714.3	7 644.0	7 635.1	7 306.1	7 231.9	7 222.5
Total	441.4	471.1	486.8	10 318.4	10 988.1	11 232.6	9 877.0	10 517.0	10 745.8

Source: Authors' calculation from MAGNET results

Figure 57: Growth of the EU exports to selected FTA partners (in % from 2020 to 2030) and their share in the EU exports for pork (%)



Source: Authors' calculation from MAGNET results

Table 22: Arable crops EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	495.8	497.2	494.0	1.4	1.4	1.4	- 494.3	- 495.8	- 492.5
CAN	1 895.5	1 901.2	1 897.2	13.3	13.4	13.4	-1 882.2	-1 887.8	-1 883.8
CHL	132.4	133.0	134.5	1.5	1.6	1.6	- 130.8	- 131.5	- 132.8
IDN	8.6	9.3	9.3	5.8	7.1	7.2	- 2.8	- 2.2	- 2.1
JPN	7.2	7.2	7.2	27.5	27.6	27.7	20.3	20.4	20.4
Mercosur	5 223.9	5 237.2	5 220.3	1.0	1.1	1.1	-5 222.9	-5 236.1	-5 219.2
MEX	54.9	55.3	55.3	0.7	1.1	1.1	- 54.2	- 54.3	- 54.2
MYS	0.2	0.3	0.3	1.3	1.3	1.3	1.1	1.0	1.0
NZ	32.1	32.4	32.4	16.7	16.6	16.7	- 15.4	- 15.8	- 15.7
PHL	1.0	1.0	1.0	23.1	30.1	30.1	22.2	29.2	29.1
THA	5.2	5.2	5.2	0.1	0.1	0.1	- 5.1	- 5.1	- 5.1
VNM	0.2	0.2	0.2	15.9	23.0	23.0	15.7	22.8	22.9
12 FTAs	7 857.0	7 879.6	7 856.6	108.4	124.6	124.6	-7 748.6	-7 755.0	-7 732.0
Other countries	8 934.6	8 946.8	8 932.1	8 888.0	8 861.4	8 860.6	- 46.7	- 85.3	- 71.5
Total	16 791.6	16 826.4	16 788.7	8 996.3	8 986.0	8 985.3	-7 795.3	-7 840.4	-7 803.5

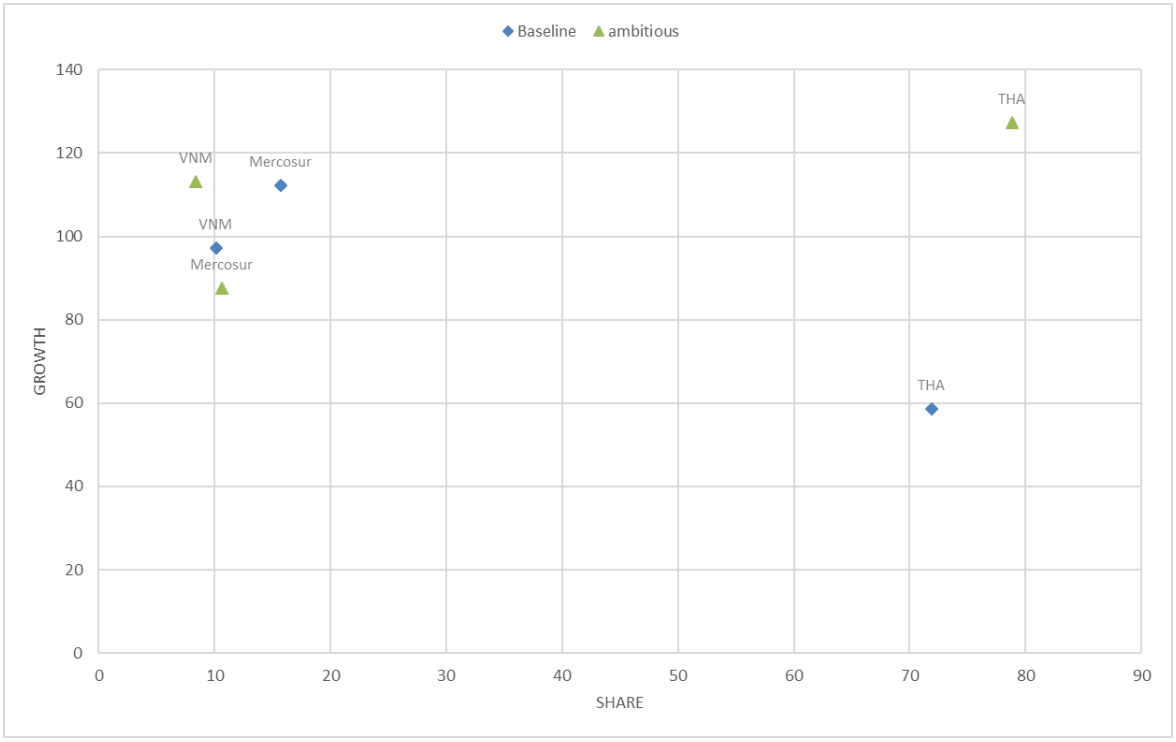
Source: Authors' calculation from MAGNET results

Table 23: Rice EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	1.2	1.5	2.0	6.9	6.9	6.9	5.7	5.3	4.9
CAN	0.0	0.0	0.0	3.0	3.0	3.0	3.0	2.9	3.0
CHL	0.2	0.4	0.4	0.4	0.4	0.4	0.1	0.0	0.0
IDN	1.4	1.7	2.2	0.0	0.0	0.0	- 1.3	- 1.7	- 2.2
JPN	4.5	4.5	4.3	0.1	0.1	0.1	- 4.5	- 4.5	- 4.3
Mercosur	54.7	49.6	48.3	15.2	25.6	25.9	- 39.5	- 24.0	- 22.4
MEX	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4
MYS	0.1	0.2	0.2	0.1	0.4	0.2	- 0.1	0.3	0.0
NZ	0.1	0.3	0.3	0.5	0.5	0.5	0.4	0.3	0.3
PHL	0.3	0.4	0.5	0.1	0.1	0.2	- 0.2	- 0.3	- 0.4
THA	250.4	301.3	358.8	0.0	0.1	0.1	- 250.3	- 301.2	- 358.7
VNM	35.3	38.2	38.2	0.0	0.1	0.1	- 35.3	- 38.0	- 38.0
12 FTAs	348.2	398.1	455.2	26.6	37.5	37.8	- 321.6	- 360.6	- 417.4
Other countries	1 040.5	1 022.4	979.4	303.1	302.3	305.2	- 737.4	- 720.1	- 674.1
Total	1 388.7	1 420.5	1 434.6	329.7	339.8	343.0	-1 058.9	-1 080.7	-1 091.5

Source: Authors' calculation from MAGNET results

Figure 58: Growth of the EU imports from FTA partners (in % from 2020 to 2030) and their share in the EU imports for rice (%)



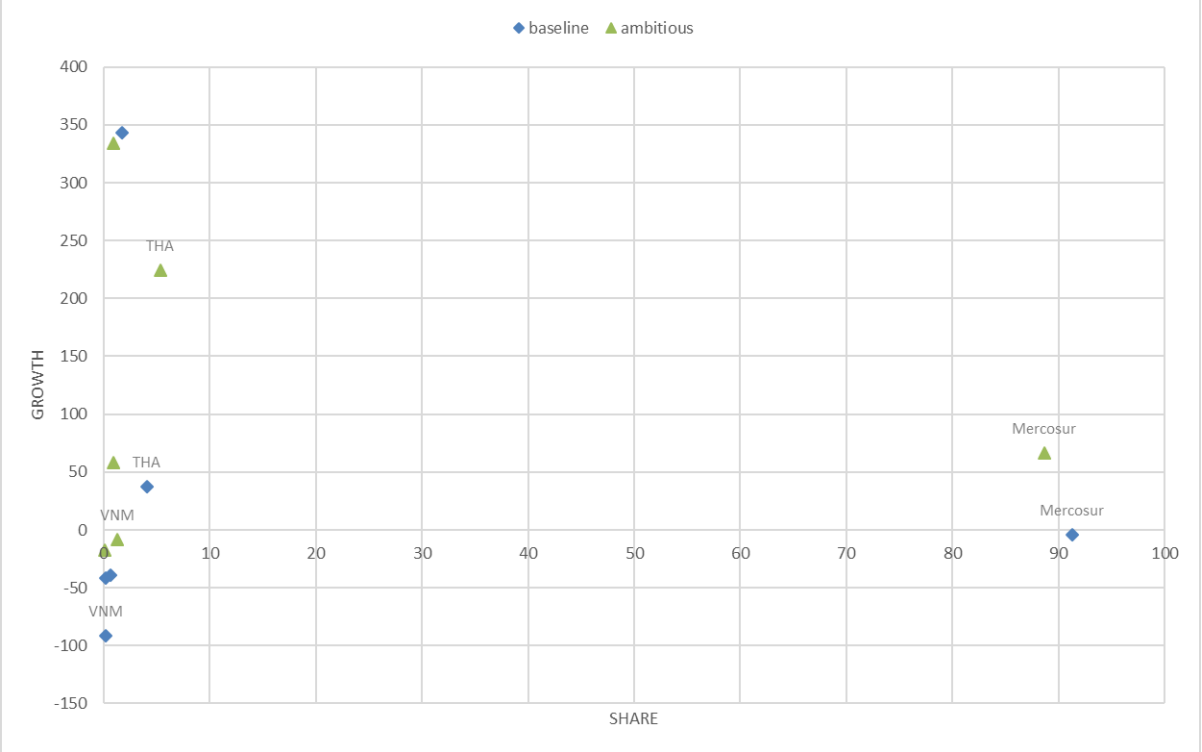
Source: Authors' calculation from MAGNET results

Table 24: Sugar EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	1.5	2.3	3.7	3.7	3.7	3.7	2.1	1.4	0.1
CAN	0.0	0.0	0.0	3.6	4.2	4.2	3.6	4.2	4.2
CHL	0.5	0.5	0.5	7.1	7.2	7.3	6.6	6.7	6.8
IDN	0.0	0.0	0.0	11.6	14.9	15.0	11.6	14.9	15.0
JPN	1.1	2.7	2.7	2.2	2.8	2.8	1.2	0.0	0.0
Mercosur	155.3	271.2	271.0	4.9	10.1	10.1	- 150.5	- 261.1	- 260.9
MEX	2.9	2.9	2.9	4.9	5.7	5.7	1.9	2.8	2.8
MYS	0.3	0.4	0.4	2.4	2.4	2.4	2.1	1.9	1.9
NZ	1.2	3.8	3.8	3.5	3.8	3.8	2.3	0.0	- 0.1
PHL	0.1	0.2	0.4	3.7	4.5	4.6	3.6	4.3	4.2
THA	6.9	10.3	16.3	1.7	3.0	3.3	- 5.2	- 7.3	- 13.0
VNM	0.4	4.1	4.0	0.9	1.4	1.4	0.5	- 2.6	- 2.6
12 FTAs	170.3	298.4	305.8	50.2	63.6	64.0	- 120.1	- 234.8	- 241.7
Other countries	738.9	722.4	721.7	1 566.1	1 563.4	1 562.5	827.2	841.1	840.8
Total	909.1	1 020.8	1 027.4	1 616.3	1 627.0	1 626.5	707.2	606.3	599.1

Source: Authors' calculation from MAGNET results

Figure 59: Growth of the EU imports from FTA partners (in % from 2020 to 2030) and their share in the EU imports for sugar (%)



Source: Authors' calculation from MAGNET results

Table 25: Fruit and vegetable EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	175.0	179.5	191.5	36.4	36.7	36.9	- 138.7	- 142.8	- 154.7
CAN	158.6	159.9	159.6	90.1	95.0	95.1	- 68.5	- 64.8	- 64.5
CHL	784.2	787.3	795.4	7.7	7.7	7.7	- 776.5	- 779.6	- 787.7
IDN	64.2	63.9	63.8	6.3	8.5	8.6	- 57.9	- 55.3	- 55.2
JPN	12.3	13.8	13.8	32.2	34.9	34.9	19.9	21.1	21.1
Mercosur	971.7	1 198.9	1 197.2	147.1	195.1	195.2	- 824.6	-1 003.7	-1 002.0
MEX	183.4	185.7	185.4	31.4	31.3	31.3	- 152.0	- 154.3	- 154.0
MYS	9.0	11.1	11.0	27.5	31.4	31.6	18.5	20.4	20.6
NZ	357.2	406.5	423.7	8.6	8.6	8.7	- 348.6	- 397.8	- 415.0
PHL	89.9	89.7	89.8	2.5	5.0	5.2	- 87.4	- 84.7	- 84.6
THA	46.4	50.0	51.3	10.5	14.8	15.0	- 35.8	- 35.2	- 36.4
VNM	321.5	321.6	321.0	6.9	8.9	8.9	- 314.6	- 312.7	- 312.1
12 FTAs	3 173.5	3 467.6	3 503.5	407.2	478.1	479.0	-2 766.3	-2 989.6	-3 024.5
Other countries	13 808.2	13 695.0	13 674.0	6 827.0	6 830.1	6 831.2	-6 981.2	-6 864.9	-6 842.7
Total	16 981.7	17 162.6	17 177.5	7 234.1	7 308.1	7 310.2	-9 747.5	-9 854.5	-9 867.3

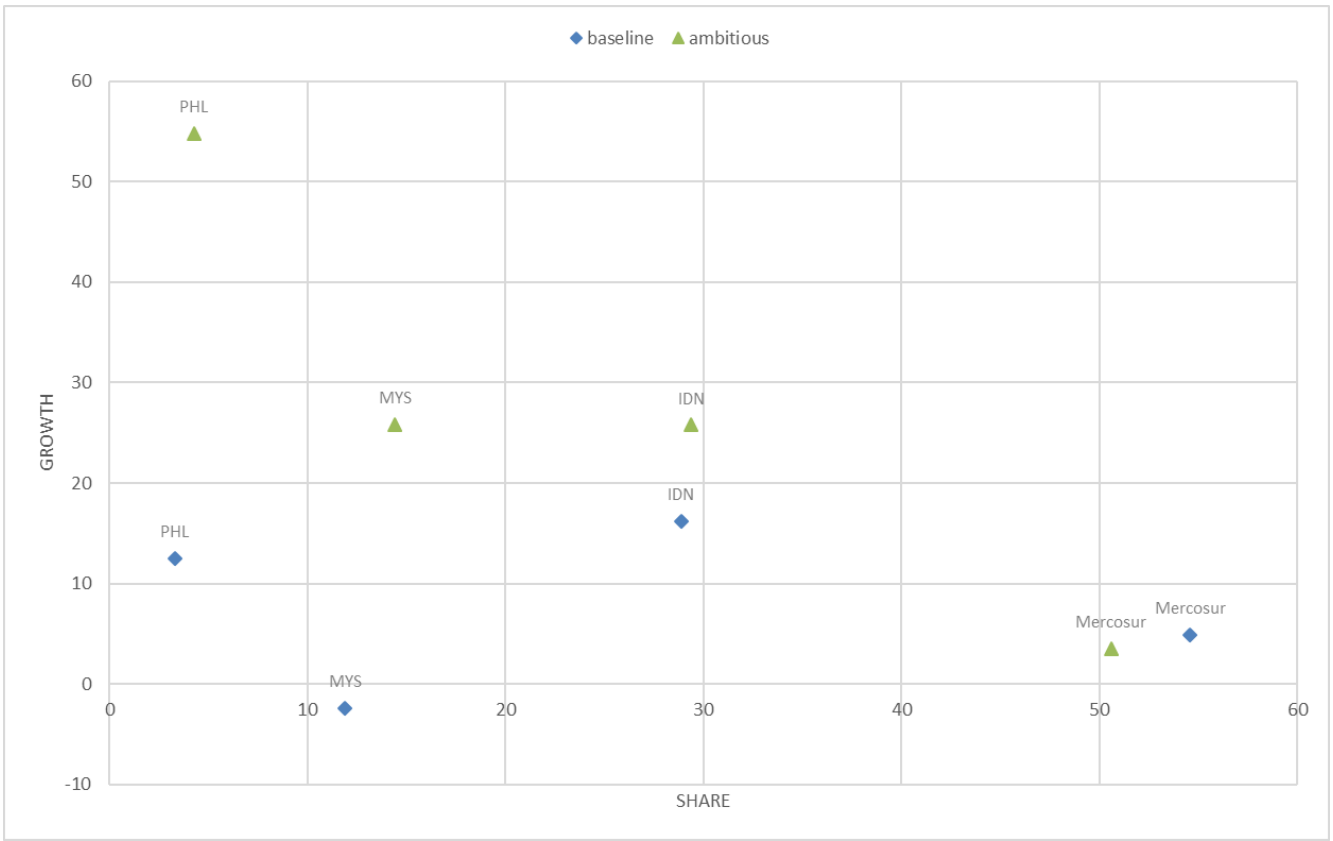
Source: Authors' calculation from MAGNET results

Table 26: Oils and Meals EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	3.3	4.9	16.2	104.3	105.7	106.0	101.0	100.9	89.9
CAN	14.3	16.5	15.8	172.8	175.5	174.2	158.4	159.0	158.4
CHL	57.9	56.0	54.7	10.0	10.2	10.5	- 47.8	- 45.8	- 44.2
IDN	3 792.1	3 878.6	4 104.8	7.1	8.8	8.9	-3 785.0	-3 869.8	-4 095.9
JPN	16.0	18.1	17.7	119.4	124.7	125.0	103.4	106.7	107.4
Mercosur	7 164.8	7 157.4	7 066.6	124.0	204.2	204.6	-7 040.9	-6 953.2	-6 861.9
MEX	18.9	18.9	18.9	57.5	57.5	57.6	38.6	38.6	38.6
MYS	1 563.6	1 858.5	2 014.7	15.4	17.2	17.3	-1 548.2	-1 841.3	-1 997.5
NZ	2.9	3.4	3.3	18.5	18.8	18.9	15.5	15.4	15.6
PHL	432.6	522.6	595.3	10.3	13.8	13.8	- 422.3	- 508.8	- 581.5
THA	58.4	59.3	59.3	13.0	90.6	89.8	- 45.4	31.2	30.5
VNM	1.6	1.6	1.6	8.9	16.9	17.0	7.3	15.4	15.4
12 FTAs	13 126.4	13 595.8	13 968.8	661.1	844.1	843.6	-12 465.3	-12 751.7	-13 125.2
Other countries	4 856.1	4 776.9	4 696.6	4 188.0	4 156.8	4 155.5	- 668.0	- 620.1	- 541.1
Total	17 982.5	18 372.7	18 665.4	4 849.1	5 000.9	4 999.1	-13 133.4	-13 371.8	-13 666.3

Source: Authors' calculation from MAGNET results

Figure 60: Growth of the EU imports from FTA partners (in % from 2020 to 2030) and their share in the EU imports for oils and meals (%)



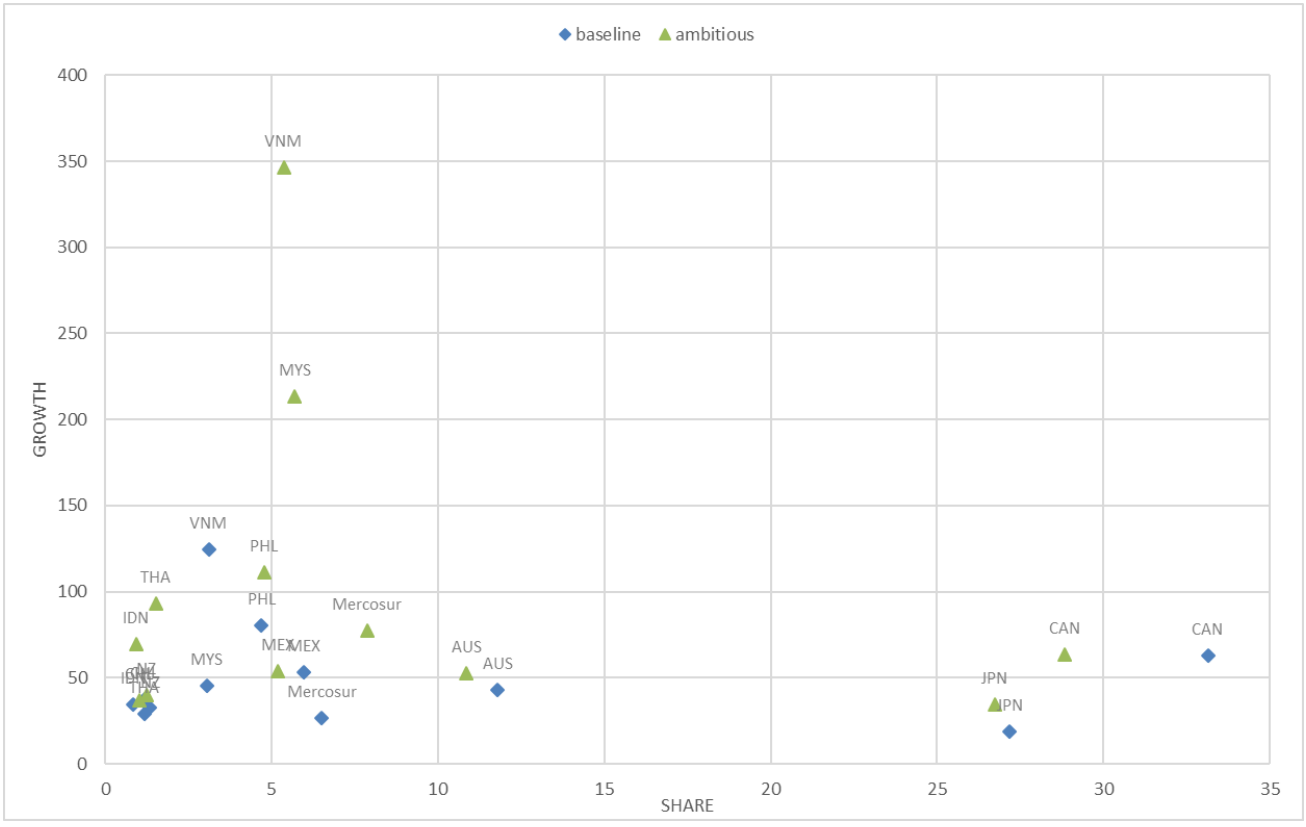
Source: Authors' calculation from MAGNET results

Table 27: Beverages EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	179.4	184.1	197.8	669.7	712.9	712.6	490.3	528.8	514.8
CAN	24.3	26.0	26.0	1 882.3	1 893.2	1 893.0	1 858.0	1 867.2	1 867.0
CHL	455.1	455.8	455.8	66.5	66.3	66.3	- 388.6	- 389.5	- 389.6
IDN	107.1	127.0	118.1	48.0	55.0	60.5	- 59.1	- 72.0	- 57.6
JPN	23.7	26.0	26.0	1 544.1	1 754.4	1 754.1	1 520.4	1 728.5	1 728.1
Mercosur	843.8	1 009.4	1 009.6	369.2	516.9	516.8	- 474.6	- 492.5	- 492.8
MEX	174.6	174.8	174.8	339.0	340.8	340.8	164.4	166.0	166.0
MYS	8.4	9.9	10.4	173.4	226.8	373.1	164.9	216.9	362.7
NZ	83.3	89.4	89.4	76.5	80.3	80.9	- 6.7	- 9.1	- 8.5
PHL	30.9	35.6	38.1	266.7	279.0	312.6	235.9	243.4	274.5
THA	41.1	45.0	47.8	66.6	80.7	99.6	25.5	35.6	51.8
VNM	3.2	3.6	3.6	177.1	352.1	351.9	173.9	348.5	348.3
12 FTAs	1 974.9	2 186.6	2 197.3	5 679.3	6 358.3	6 562.1	3 704.3	4 171.7	4 364.8
Other countries	7 597.1	7 599.3	7 600.3	36 755.4	36 709.9	36 706.2	29 158.3	29 110.6	29 106.0
Total	9 572.1	9 785.9	9 797.6	42 434.7	43 068.2	43 268.3	32 862.6	33 282.3	33 470.7

Source: Authors' calculation from MAGNET results

Figure 61: Growth of the EU exports to selected FTA partners (in % from 2020 to 2030) and their share in the EU exports (2030) for beverages (%)



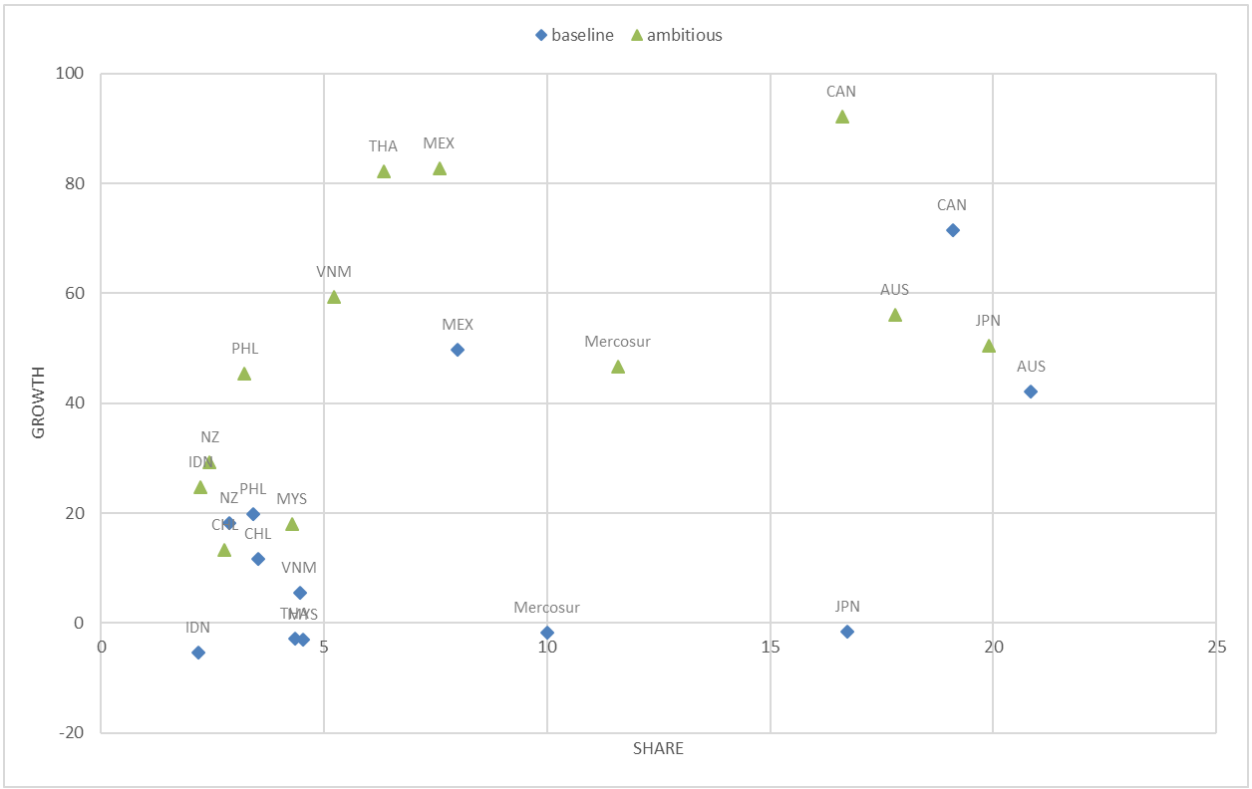
Source: Authors' calculation from MAGNET results

Table 28: Other foods EU imports, exports, and balance by FTA partners and scenarios (2030, EUR million)

	Imports			Exports			Balance		
	BASE	CONS	AMBI	BASE	CONS	AMBI	BASE	CONS	AMBI
AUS	34.0	43.5	47.7	1 333.6	1 443.3	1 465.2	1 299.7	1 399.8	1 417.5
CAN	158.2	240.6	241.3	1 220.8	1 368.2	1 368.0	1 062.6	1 127.7	1 126.6
CHL	337.6	337.8	337.3	224.9	225.7	228.2	- 112.7	- 112.1	- 109.0
IDN	495.5	570.1	580.2	139.6	171.7	184.0	- 355.9	- 398.4	- 396.3
JPN	101.1	128.7	128.5	1 070.3	1 638.0	1 637.6	969.2	1 509.4	1 509.1
Mercosur	2 201.8	3 110.0	3 106.2	639.7	954.1	953.7	-1 562.1	-2 155.9	-2 152.4
MEX	235.9	323.6	323.2	511.8	625.0	624.8	275.9	301.3	301.6
MYS	165.5	221.0	226.7	289.5	327.3	352.5	124.0	106.3	125.9
NZ	7.8	8.9	11.0	183.7	197.2	200.8	175.9	188.3	189.8
PHL	145.2	160.2	202.5	218.1	245.6	264.8	72.9	85.4	62.3
THA	595.9	709.7	1 021.9	278.1	501.6	521.6	- 317.8	- 208.1	- 500.2
VNM	337.4	446.7	446.1	285.1	430.7	430.6	- 52.4	- 16.0	- 15.5
12 FTAs	4 815.8	6 300.9	6 672.6	6 395.2	8 128.6	8 232.0	1 579.4	1 827.7	1 559.4
Other countries	20 637.8	20 599.6	20 569.7	48 218.2	48 062.8	48 057.1	27 580.5	27 463.3	27 487.4
Total	25 453.6	26 900.4	27 242.3	54 613.4	56 191.5	56 289.1	29 159.8	29 291.0	29 046.8

Source: Authors' calculation from MAGNET results

Figure 62: Growth of the EU exports to FTA partners (in % from 2020 to 2030) and their share in the EU exports for other foods (%)



Source: Authors' calculation from MAGNET results

Annex 4. Web infographic with interactive data visualisations

This report is associated to an interactive infographic published on the European Commission's data portal of agro-economic modelling (DataM website). Find below the link and the related QR code.

Figure A1. QR code – FTA 2021 interactive infographic

Source: JRC, 2021

This is the link to the home page of the DataM portal

Figure A2. QR code – DataM home page URL

https://datam.jrc.ec.europa.eu

Source: JRC, 2021.

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