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The EU-Mercosur agreement: An in-depth analysis of CO2 emissions and labor market results

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Abstract

The EU-Mercosur agreement has raised a hot debate, particularly due to its potential environmental effects. We estimate its impact using a Computable General Equilibrium (CGE) model with 41 sectors-4 factors-6 region (EU27, Brazil, Argentina, Paraguay, Uruguay and ROW), which has three advanced features: 1) Climate of competition à la Melitz (2003) in various manufacturing sectors, which allows us to grasp productivity effects related to trade; 2) Foreign multinationals in advanced service sectors, operating à la Krugman (1980), which is suitable to grasp multinationals' behavior; 3) CO_2 emissions across sectors and regions.

Our results point out that this agreement is a "win-win" for its signatories. Everyone wins, but the impact will be more visible in the Latin American side. Our analysis of the total imports of the EU27 shows that this agreement allows the Mercosur countries to export products in which they have a comparative advantage, while moving their export basket towards more complex products. It also allows the European side to improve its specialization in more complex sectors. For year 16, i.e., after 15 years of implementation, the agreement generates a small increase (0.14%) in CO_2 emissions by the EU-Mercosur region which, however, translates into an improvement in the emissions/GDP ratio of the EU-Mercosur region (0,17% GDP increase). The improvement in the emissions/GDP ratio also holds for the world as a whole.

The impacts we derive are generally larger and more positive than the ones in the literature. This is firstly because our modeling includes components of the final agreement reached (Agreement in Principle of June 28, 2019) that, to our knowledge, have not yet been included in most previous studies, such as Foreign Direct Investment (FDI) in services and government procurement. Additionally, some of the previous studies focus on the effects for goods sectors, without including the impact on services. Maybe counterintuitively, we find that services sectors play a very important role in this agreement. Moreover, our results would be much smaller in a framework of perfect competition, as opposed to monopolistic competition à la Melitz (2003) in manufactures and to the imperfect competition à la Krugman (1980), adopted for the services sectors with multinationals.

Introduction

The European Union (EU27) and Mercosur (Argentina, Brazil, Paraguay and Uruguay) reached a political trade agreement on June 28 (2019), after 20 years of negotiation. The ratification of "the EU-Mercosur Association Agreement" is still pending due to the opposition of some EU member states. Besides, a hot debate has been raised on environmental protections particularly surrounding Brazil.

Latin America has a lot of natural resources and great potential for regional integration. Since the end of February 2022, Russian's invasion of Ukraine is shaking the global economy, after a devastating pandemic. The accumulation of these effects is reducing the supply of goods and services, raising the prices of food (FAO, 2022), fuel and fertilizers and increasing the cost of living. The invasion has awoken a new vision of geostrategy, of world partners and allies. It has also put on the table the need to rethink import dependencies.

China has been strengthening its ties with Mercosur countries in the last years. In 2011, the EU was Mercosur's first trading partner in trade in goods, both on the export and import side, ahead of China and the United States (US). However, since recently China has taken the first position as goods trade leader in the area, as Figures 1 and 2 show.

[Figures 1 and 2 around here]

However, the EU is still the leading direct investor in the region, with 55% of Foreign Direct Investment (FDI) in 2019 and the leading exporter to Mercosur in services, with around 26.5% total imported services of Mercosur (Timini and Viani, 2020). The agreement would provide an opening to European companies in both goods markets and the generally more protected services markets. A novel aspect of our modeling strategy is that we include the impact of government procurement. The agreement establishes that European companies, and for the time being only European companies, will be able to compete on an equal footing with local Mercosur companies. In view of the pulse between the US and China, the EU would have a competitive advantage in this respect. It should not be overlooked that the EU differs from other partners in its commitment to sustainability and more advanced social and labor standards. This is even more so after the "Green Deal" and Next EU Generation recovery plan of which 30% of the funds are destinated to protect the environment (European Commission, 2022a; 2022b). By contrast, it has been pointed out that President Biden's Infrastructure Investment and Jobs Act lacks specific provisions to fight climate change (New York Times, 2021) and Chinese commitments in the last COP26 international climate conference in Glasgow in 2021 were much less profound than the ones of the EU or the US.

The EU is the first global investor worlwide. One out of every two foreign investment projects in Mercosur comes from Europe (Financial Times, 2020). The opportunity brought by the opening of Mercosur to investment is very large and has been overlooked in most of the studies available on Mercosur, which do not model FDI. The IDB (2019) mentions some cases in which, after the signing of Free Trade Agreements, FDI was heavily increased. For example, in Chile, the deal with the EU multiplied European investments in that country by six.

Although, most of the FDI projects in Mercosur have as origin some European country, China is also taking positions. In fact, China already occupies the fourth position in terms of this type of investment. It is also in the same position in terms of number of projects, number of companies and number of jobs created. However, the average amount of capital invested in each project exceeds that of the other countries, with an average of US$121.3 million per project (Financial Times, 2020). More than 63% of Chinese foreign shares belong to state-owned companies in sectors such as finance or raw material extraction industries (Pérez Ludeña, 2018).

Although there are several studies on the EU-Mercosur agreement (for a review see Gómez Gómez-Plana, 2021), few of them have incorporated the outcome of the agreement that was reached in June 2019. This is a key feature of our study in which we have carefully analyzed the available texts to translate them into simulations as realistic as possible. Indeed, the present paper, bases a large part of its simulations, such as the negotiated tariff and quota reduction, the opening to FDI or government procurement on the chapters and annexes of the negotiated agreement. These chapters show, for example, which sectors are liberalized, and which are not, as well as indications on the degree of ambition in liberalization.

Based on this information we perform a detailed analysis of the ex-ante impact of the agreement using a general equilibrium technique, namely, a Computable General Equilibrium Models (CGE) model. We disaggregate the world economy for the regions of EU27, Brazil, Argentina, Paraguay, Uruguay and the Rest of the World and consider 41 sectors in each of them. Our multi-sector, multi-factor, multi-region CGE of the world economy has two advanced features: 1) The modeling of a climate of competition à la Melitz (2003) in several manufacturing sectors; and 2) The presence of foreign multinationals in the advanced service sectors, operating in a climate of imperfect competition à la Krugman (1980). By including a climate of monopolistic competition à la Melitz (2003), the model allows us to capture two real-world effects: 1) The existence of firms with different sizes, costs, productivities and prices within each sector, which generates endogenous variations in productivity when barriers to trade go down; and 2) The ability to capture firms opening or closing, or moving from serving one foreign market to serving another. In other words, Melitz captures variations not only in the intensive margin of international trade (variations in its intensity for a given origin or destination), but also in the extensive margin (or changes in the number of countries of destination or origin of trade flows). In addition, in order to be able to offer the impact on jobs after the agreement, we have introduced a wage curve (Oswald---] as well as frictions to the movement of labor, in line with the work of Balistreri et al. (2018; 2016).

With regard to the environmental sustainability analysis, we offer quantitative results of the treaty's impact on C02 emissions derived within the CGE itself. It is worth pointing out were are beef exports of the Mercosur countries. The reader will not be surprised to find out that the big majority of them is going to China, as Figure 3 shows.

[Figure 3 around here]

Our modeling focuses on the impact of four important elements of the agreement: 1) Tariffs and quotas; 2) Non-tariff measures on trade; 3) Non-tariff measures on Foreign Direct Investment (FDI) in services; and 4) Government procurement. This is an

ambitious modeling, considering several components that, to the best of our knowledge, have not been previously estimated for this agreement, such as the impact of FDI and government procurement.

Besides, in our model the original trade in goods data from the GTAP database (Aguiar et al., 2019), have been replaced by the most up-to-date information using the average trade between EU27 and the four Mercosur countries in the period 2017-2019 according to the International Trade Center-Trade Map data (2020a).

Our results suggest that all signatory countries would gain and we derive larger positive impacts than the ones from previous studies. Besides, the agreement would favor the specialization of the economies in cleaner sectors because, as we shall see, the increase in GDP growth caused by the treaty would be larger than the increase in CO_2 emissions. In addition, our analysis of trade impacts points out that this agreement would not be mainly about Mercosur agricultural products. Services exports from Mercosur to the EU27 are larger than agricultural exports with the agreement, even though both services and agriculture are surpassed by Mercosur's exports of manufactures to the EU. The agreement would be a source of job creation for all the countries involved, thus, helping to fight inequality and poverty. Finally, in the view of China's advance in Mercosur, this agreement is of a strategic nature for all the parts.

The rest of the paper is organized as follows. The next section summarizes the main features of the EU-Mercosur agreement. The next one explains the model, data and simulations. Section 3 offers the main macro and microeconomic results. We pay particular attention to the impact of different specifications of the values that underlie the wage curve, as well as to CO_2 emissions and to the goods and services that would be traded after the agreement. The last section concludes. Appendix 1 offers the detail of our model sectors.

1. The EU-Mercosur Association Agreement

The deal consists of three components: trade, political dialogue and economic cooperation. The EU signed the trade agreement with Mercosur in June 2019 and in June 2020 the political and cooperation pact. Various legal texts concerning the trade pillar of the Agreement are available on the website of the European Commission (2019)[1]. This paper focuses on the trade pillar which, being a modern treaty, includes other aspects such as FDI, digital trade, trade in services and public procurement, among many others.

The EU-Mercosur agreement contains an ambitious scheme of tariff reductions and quotas, which is of greater importance than in other trade agreements, as current barriers are particularly high. Average tariffs in Mercosur are considerably larger than the world average tariffs. The agreement also includes reductions in non-tariff measures, sometimes called non-tariff barriers, faced by trade and also those faced by Foreign Direct Investment. Another important point in the agreement is that it is the first time that

[1] According to the accompanying note: "The texts will become final upon signature. The agreement will become binding on the Parties under international law only after each Party has completed its internal legal procedures necessary for the entry into force of the Agreement (or its provisional application)."

Mercosur opens up to public procurement to foreign companies, having only recently begun liberalizing its public services. The agreement also includes other advanced aspects such as intellectual property protection, facilitation of the movement of professionals, sustainability issues, digital trade, bilateral safeguards, defense of competition, customs cooperation, trade facilitation, dispute settlement, state-owned enterprises and Small and Medium Enterprises (SMEs), among others.

It is difficult to quantify the extent to which some of these aspects encourage trade. For example, improved intellectual property protection is of great importance for European Geographical Indications. These include Tiroler Speck (Austria), Fromage de Herve (Belgique), Münchener Bier (Germany), Comté (France), Prosciutto di Parma (Italy), Polska Wódka (Poland), Queijo S. Jorge (Portugal), Tokaji (Hungary) or Jabugo (Spain), among others. The agreement contemplates protection against imitation of 357 geographical indications of traditional European products. This is the largest ever in a European trade agreement. After almost two decades of the trade agreement with Mexico, the EU's most important trading partner in Latin America, closely followed by Brazil, 232 EU geographical indications have been recognized for spirits. With the new revised agreement that reached an "Agreement in Principle" in 2018 with Mexico, the number of EU Geographical Indications will increase to 340 (European Commission, 2020a, p. 136 and p. 140). Logically, this protection has a positive impact on trade. However, quantifying the importance of these elements is very complex, but let us not forget that this deal advances on these fronts, even if we do not expressly model them.

Another example of advances in the trade relationship that are difficult to quantify is the following. The provisions of the agreement provide transparency and avoid opaque import and export licensing procedures that pose significant costs and barriers to firms. Non-automatic import or export licenses are prohibited, except for those necessary to implement the measures of this agreement, such as tariff quotas for products that are not fully liberalized. The agreement obliges the Parties to notify each other in detail of their import and export licensing procedures and to update these notifications when necessary.

Although the EU27 already has numerous trade deals in Central and South America, the present agreement is, in terms of population and tariff savings, the largest that the EU27 has ever signed even worldwide. Taken together, the four Mercosur countries constitute the world's fifth largest economy and a population of more than 266 million. In the face of China's recent advance, the EU27 will be the first major trading partner to formalize an agreement with Mercosur, which neither the US nor China has, granting preferential access to their countries in a currently highly protected area. For Mercosur, the agreement is also the largest it has ever negotiated.

In fact, compared to the most recent EU trade agreements with Japan and Canada (2020) a much larger population is covered by this agreement, namely, 716.3 million people, which represent 9.2% of the world population (see Table 1). However, the GDP per capita is lower in Mercosur than in Japan or Canada. With respect to GDP, the EU-Mercosur agreement is somewhat smaller than the one of Japan but higher than the one of Canada. In terms of trade flows, it represents less than the trade of both Canada and Japan, however, it would involve considerably larger tariff savings. Mercosur is around 2.2% of EU’s trade in goods and services (slightly less than the agreements with Japan and

Canada). However, as we have already mentioned it implies a much larger reduction in costs, compared to Canada and Japan, since tariffs cuts will be sharper. The European Commission estimates savings of around €3.6 billion in tariffs, while they were of €0.9billion for Japan and €0.54 Canada, after excluding the UK which roughly accounted for 10% of trade of the EU28.

[Table 1. around here]

Nowadays, around 850,000 jobs in the EU are related to exports to Brazil alone. So the potential of this agreement to create new jobs should not be underestimated.

2. Model, data and simulations

Our model is based in the ones we have used for our previous analyses of economic integration and disintegration (Latorre, Olekseyuk and Yonezawa, 2019a; Latorre, Olekseyuk and Yonezawa, 2020; Latorre, Olekseyuk, Yonezawa and Robinson, 2020). These models extend the groundbreaking work of Balistreri, Hillberry, and Rutherford (2011), which was the first CGE that incorporated a full specification of the Melitz (2003) model in a CGE. The extension includes the presence of multinationals in service sectors in a climate of monopolistic competition à la Krugman (1980), following the work of Latorre and Yonezawa (2018). The resulting model (Latorre, Olekseyuk and Yonezawa, 2019a) incorporates different cost specifications for firms that allow us to analyze in detail the impact of tariffs and non-tariff barriers to trade and FDI. Neither of the CGE analyses of the EU-Mercosur agreement of the LSE (2020) nor Carrico et al. (2020), include in their CGE the impact of FDI and both use a perfect competition climate. However, the LSE model is a dynamic recursive one, therefore incorporating adjustments in the capital stock, population and other variables.

In our previous models we had not explicitly modeled the impact of unemployment, as we do in the present model. We now include a "wage curve" following the work of Blanchflower and Oswald (1994; 1995, 2005). This wage curve introduces into the model the relationship that the higher the unemployment rate, the lower the wages and vice versa. Another extension we incorporate in the present model which was absent in the previous ones is the introduction of frictions to labor movement following the work of Balistreri et al. (2016; 2018). We incorporate the assumption that 50% of the labor force in each sector is sector-specific labor. This assumption has a long tradition in the economic literature and implies that this 50% of workers in each sector cannot be hired in other sectors of the economy, being a distinct labor force from workers in other sectors.

In our central specification of the model we include certain dynamic features, such as productivity effects in response to a trade shock typical of a competitive environment à la Melitz (2003). Moreover, this model follows a long tradition of work, which has been used to evaluate the impact of various trade policies. It was first applied to the impact of Russia's accession to the World Trade Organization (Rutherford and Tarr, 2008). Subsequently, it has been applied to liberalization processes in countries such as Tanzania (Latorre, 2016) and Ukraine (Olekseyuk and Balistreri, 2017).

As is common in CGEs used for the analysis of trade agreements, there is a representative agent for each region, whose income comes from the remuneration of all factors of production and tax revenues corresponding to the different types of taxes. This is a step forward with respect to the input-output techniques in which, beyond the rents of the factors of production, the existence of taxes and transfers between the different agents is not present. The representative agent in our CGE fully spends its income on private consumption, public consumption and investment. Since the model is applied to trade policies, we use the standard specification that it is private consumption that is the component that adjusts for changes in the representative household's income. This implies, for example, that during the simulations the weight of the public sector in the economy does not change in order to avoid the distortions in the results that such a change would cause. Considering that the weight of the public sector does not vary in trade and investment simulations may be an attractive argument in these times when the sovereignty of states seems to be questioned when signing "deep" trade agreements, i.e. much more ambitious than a simple modification of tariffs. The European Commission has expressly stated that "all EU trade treaties leave governments free to organize their public services as they freely wish" (European Commission, 2016).

The model presents different types of taxes on production, consumption and foreign trade. The latter includes tariffs or subsidies on exports and imports specified at the level of products and regions, as well as cost specifications for firms that allow for a detailed analysis of the impact of non-tariff barriers. Declines in non-tariff measures lead to efficiency gains (reducing "Samuelson type deadweight costs" or "sand in the wheels") and also reduce rents for some agents in the economy.

Our model has six regions: EU27, Brazil, Argentina, Paraguay, Uruguay and Rest of the world. As for the number of factors of production, there are four: land, natural resources, capital and labor. The number of sectors is 41, making the present analysis the study with the largest number of sectors analyzed, as far as we know. Their complete list appears in the ANNEX. In addition to the 41 sectors covered, the impact will be provided for the aggregates of total agriculture, total manufacturing, total services and total sectors. The sectors move either in a climate of perfect competition, monopolistic competition à la Melitz (2003) or monopolistic competition à la Krugman (1980), as indicated in the last column of the aforementioned table.

Costs, production and price structures are very different in the three types of sectors but, in any case, firms always minimize production costs. In perfectly competitive industries there are constant returns to scale. Products are differentiated according to their country of origin. In other words, the choice between imports of different origins is based on Armington's idea of geographically differentiated products (Armington, 1969), so that each region produces its own distinctive variety of product, being imperfectly substitutable for those produced in other regions. This Armington assumption allows us to reflect the empirical evidence of international trade in different varieties of the same good.

In sectors of monopolistic competition there are economies of scale (in blue in the last column of the Table in the ANNEX). There is also product differentiation, however, which comes from each firm producing a different variety following the models of

Krugman (1980). This has important consequences since the number of firms (and product varieties) affects productivity. For example, when there are more firms in an industry, they specialize and the productivity of the sector increases, so that the cost of using intermediate inputs from other firms decreases as the number of firms supplying them increases. Consumers also benefit from welfare gains due to a greater variety of products.

The sectors that we call, following the literature (Tarr, 2012), "advanced services" (banking, insurance, business services, air transport, maritime transport, communications, hotels and restaurants) include two types of firms: domestic firms and firms in the hands of foreign capital. Both types of firms produce with different technologies; in particular, multinationals use imported intermediate inputs that are not available to domestic firms in line with empirical evidence that multinationals are more intensive in the use of imported intermediate goods (Latorre, 2012; 2013). Additionally, the model implements the effects in a differentiated manner according to the sector of operation of multinationals. Instead of calculating the impact of the bulk of FDI in services, as other types of analysis do, it differentiates between the flows going to the different service sectors. It is clear that the impact of multinationals varies by sector (Zhou and Latorre, 2014a; 2014b; 2021). We also introduce the impact of profit repatriation which we assume to be 50% in the central estimates of the model. This is an important issue to which we have paid attention in other papers (Latorre et al., 2009 and Gómez-Plana and Latorre, 2011).

With regard to the environmental sustainability analysis, we offer quantitative results of the treaty's impact on C02 emissions derived within the CGE itself. Our emissions are calculated endogenously in response to the consumption of fossil fuels linked to the production of the different sectors and private consumption. To quantify CO_2 emissions, we consider the detail provided by the CGE input-output framework, which captures the energy inputs required for the production sectors and household consumption.

We have updated the GTAP10 database (Aguiar et al., 2019) information referring to the last year (2014) to try to reflect the world economy in 2023. More specifically, this update implies that the expected growth for the different regions in 2022 is included in the database. The Treaty shock would take place in early 2023. The update is based on the GDP growth estimated to take place in each of the regions of the model, following the techniques described in Böhringer et al. (2009).

Besides, in our model the original trade in goods data from GTAP10, have been replaced by the average trade between the EU and the four Mercosur countries in the period 2017-2019 according to the International Trade Center-Trade Map data (2020a). It is therefore the average data for the period 2017 to 2019 for goods trade flows that underlie our simulations. The most-favored-nation tariffs for these flows have also been replaced by those of the year 2019 (International Trade Center-Macmap, 2020b), which takes into account, among other aspects, Paraguay's exit from the Generalized System of Preferences. To calculate the percentage corresponding to the tariffs and quotas of a sector, and their corresponding reductions it was necessary to convert the HS codes to 8 digits by averaging them with the average trade data for the period 2017-2019.

In the EU offer, i.e. in the future tariff and quota regime, 9132 8-digit codes were negotiated in the H4 version of the HS, which were converted to 9478 8-digit codes of the H5 version. These 9478 sectors were then aggregated to the level of 47 GTAP goods sectors and then converted to the 31 goods sectors in our model. Note that our model includes a total of 41 sectors of which 10 sectors are services, where there are no tariffs. For the Mercosur offer, 9933 HS8 codes were negotiated in H4 version which were converted to 10178 codes in H5 version and then into 47 GTAP goods sectors, regrouped into the 31 goods sectors in our model.

For the estimation of non-tariff measures in goods sectors, we use the latest version of non-tariff measures (Ad Valorem Equivalents, AVEs) estimated by the World Bank (2019) and for services those of the OECD (Benz and Jaax, 2020). Our model also incorporates non-tariff measures to FDI in services sectors that come from the database developed by the World Bank (Jafari and Tarr, 2017).

Data on the weight of multinationals by sector in the EU27 come from Eurostat's "Inward Foreign affiliates" (2019), while for the weight of multinationals in Mercosur we have relied on the Financial Times (2020) "FDIMarkets" database which collects the operations of multinationals globally until September 2019 and the World Trade Organization's TISMOS database, which includes their operations until 2017 (WTO, 2020).

To quantify CO_2 emissions, we consider the detail provided by the CGE input-output framework, which captures the energy inputs required for the production sectors and household consumption. Our model includes three primary energy goods (crude oil, natural gas and coal) and two secondary energy goods (refined oil and electricity), which are produced using the primary energy goods, other intermediate inputs and factors of production (i.e., labor and capital). We use CO_2 emissions data from GTAP 10 (Aguiar et al. (2019), which is the most important greenhouse gas. This approach follows that of other CGEs, such as Abrell et al. (2019). Emissions are linked in fixed proportion to the consumption of coal, natural gas, and refined petroleum products, with CO_2 coefficients differentiated by the specific carbon content of the fuels. In the simulations, CO_2 emissions can be changed by fuel switching (fuel-to-fuel substitution) or change in energy demand (either by fuel/non-fuel substitution) or by a change in production or final demand.

3. Results

3.1 Macroeconomic Results

[Table 2. around here]

Table 1 presents an expansionary impact on several macroeconomic variables of the EU27, Argentina, Brazil, Paraguay, Uruguay and the rest of the world, once all the components of the agreement have been implemented. The variables we present are GDP, private consumption (change in equivalent variation), aggregate exports and imports, employment and CO_2 emissions. This is a very detailed analysis that few studies studies offer. The results in Table 1 are those after*:* 1) Tariffs reductions and full quotas

implementation; 2) Cuts in non-tariff measures on trade; 3) decreases in non-tariff measures on Foreign Direct Investment (FDI) in services; and 4) Openness of government procurement to foreign firms (through exports and mode 3, i.e., presence of affiliates). The estimated impact would be for what we call “year 16”, i.e., approximately fifteen years after the agreement comes into force, at which point the agreed tariff liberalization process comes to an end and the tariff regime for the future is thus fixed.

Table 1 shows larger gains for the EU27 than the ones derived by previous studies (LSE, 2020; Carrico et al., 2020; Timini and Viani (2020); Sinabell et al., 2020). However, our findings suggest that it is the Mercosur countries that derive the greatest gains. It is important to note that the increases we derive are produced by the sole forces that the EU-Mercosur agreement would set in motion, all else being equal. In the real world, the agreement would interact with many other factors, such as the recovery from the impact of Covid-19, the effects of Russian’s invasion of Ukraine, fiscal, monetary, trade policies, etc., which will push GDP and all other variables in the regions towards growth or contraction.

There is a body of previous work on the EU-Mercosur Agreement, developed as negotiations unfolded, starting with a first interregional cooperation agreement of May 29, 1992 (for a review of the literature see Gómez Gómez-Plana, 2021). However, many of these initial estimates are far from the final agreement reached. It is of particular interest, therefore, to learn about the models that include the June 28, 2019 Agreement, together with the work of the LSE (2020), which is probably one of the most influential in the literature. The main quantitative results at the macroeconomic level of these papers are collected in Table XX and use two different methodologies: applied general equilibrium models and gravity models.

Although Table XX shows different methodologies and their comparison should be interpreted with caution, the general equilibrium model of the London School of Economics (2020) obtains quantitative effects for the former EU28 as a whole, including the UK, with smaller impacts than the estimates with gravity equations of Timini and Viani (2020) and Sinabell, Grübler and Reiter (2020) and compared to the ones in this study. Both the ambitious and modest scenario of the LSE (2020) estimate a GDP increase of 0.1%.

As already noted, the LSE (2020) study does not incorporate the actually negotiated agreement, as its work started before the agreement was reached in principle. In fact, the "inception report" (LSE, 2018) which already describes the sectoral and regional aggregation and general equilibrium simulations (pp. 15 et seq.) effectively match what is presented in their final study (LSE, 2020).

Our results are more positive in general than the ones of previous studies for several regions. This is firstly because we include components of the final agreement reached (Agreement in Principle of June 28, 2019) that, to our knowledge, have not yet been included in most previous studies, such as FDI and government procurement. Additionally, several previous analyses focus on the effects for *goods* sectors, without including the impact on *services* (e.g., Timini and Viani, 2020; Sinabell, Grübler and Reiter, 2020). In addition, the results we obtain here would be much lower in a framework of perfect competition, as opposed to monopolistic competition à la Melitz (2003), which

we include for many of the manufacturing sectors in our model. Additionally, if we eliminate the operations of multinationals or analyze their interactions in a climate of perfect competition, instead of in a monopolistic competition framework à la Krugman the impact would also be less positive than the one of Table XX.

Our results are in line with the work of Timini and Viani (2020) and Sinabell, Grübler and Reiter (2020), with regard to the impact of GDP, which is greater for the two smaller Mercosur countries (Paraguay and Uruguay). GDP impacts are not as big in Argentina and Brazil, which, however, will derive a considerable boost from this agreement. The results for Mercosur are more positive than for the European side of the agreement. The latter, however, would be a driving force for the EU27.

We will latter analyze the sector-level impact of the agreement. It should be noted that the gravity equation models we have analyzed do not display these results because they assume a single production sector in each region.

3.2 Analysis of the CO_2 emissions

The EU-Mercosur agreement has raised concerns about the risk of further deforestation in the Amazon and its potential environmental impact. Climate policies are imposing serious obligations that affect production and consumption patterns. The EU is taking them very seriously through the Green Deal and has reaffirmed the targets set in that deal despite the outbreak of the Covid pandemic and the Ukraine conflict. In this paper we do not analyze the effects of these climate policies. However, in this section we analyze in depth the CO_2 emissions that we have displayed in Table X. We have calculated the initial distribution of CO_2 emissions across regions and sectors, as well as the regional and sectoral contribution to the emissions generated by the agreement, which are shown in Table XX.

There are two important clarifications, however. On the one hand, our calculations of CO_2 emissions only include emissions from fossil fuel combustion. Some manufacturing sectors (e.g. the cement sector) generate CO_2 emissions due to chemical reactions and not from fossil fuel combustion, which are not included in these calculations. However, emissions not linked to the combustion process constitute only a small part of total CO_2 emissions. Moreover, emissions of other greenhouse gases (GHGs), such as methane and nitrous oxide linked to the agricultural and livestock sectors, are not included in our model. According to Shields and Orme-Evans (2015, p. 363) “About 44% of the emissions generated by livestock are CH4 (methane), which is released during enteric fermentation (eructation in ruminants) and emitted by the decomposition of manure; 27% is in the form of CO_2 emitted during the production and transport of animal products and feed, and 29% is N2O (nitrous oxide) attributable to manure and fertilizers." In the EU, 80% of GHGs come from CO_2 emissions, methane and nitrous oxide have a slightly lower contribution to GHG emissions than CO_2 in Argentina. Methane and nitrous oxide contribute slightly more to GHGs than CO_2 emissions in Brazil and methane and nitrous oxide dominate GHG emissions in Paraguay and Uruguay (LSE, 2020, pp. 72-75). For methane, 6.8% of global methane emissions were contributed equally by the EU and Mercosur in 2015 (LSE, 2020, p. 74). For nitrous oxide, the EU contributed 11% of global

emissions in 2015 and Mercosur as a whole contributed 9.6% in the same year (LSE, 2020, p. 75). A more comprehensive analysis of GHG emissions could be carried out along the lines of Beck, Rivers, Wigle and Yonezawa (2015).

Table XX presents three blocks of rows with results, which are numbered. The first block contains two rows showing the percentage changes in GDP and CO_2 emissions in year 16 of the agreement compared to their initial level. These percentage increases are the same as those displayed in Table X, but we now add the percentage increase for the region formed by the signatories (i.e., The EU and Mercosur countries) as well as for the world economy as a whole in the last columns. The third row of this first block presents the percentage change in the CO_2 emissions-to-GDP ratio in year 16, with respect to the initial ratio.

In the second block of results, we present a first row with two figures per region showing the absolute values of emissions CO_2 in millions metric tons (Mt). The first figure for each region is under the column "year 0", as it is the absolute value of the initial (pre-agreement) CO_2 emissions related to fossil fuel combustion in each region. The second figure is under the column "Dif year 16" and indicates the emissions generated by the agreement itself in year 16. This second figure is the difference between the final emissions in year 16 and the initial emissions. Both the "Year 0" and "Diff year 16" emissions are measured in Mt and are an approximation based on the initial data for the year 2023[2]. Within this second block, the following rows show how these absolute values of CO_2 emissions contribute to four different angles of the analysis, which is why they are designated as "% contribution ...". On the one hand, the percentage contribution to the initial CO2 emission quotas is calculated for both the world ("% initial contribution by region to global CO_2") and the EU-Mercosur region ("% initial contribution by signatories to CO_2 in EU-Mercosur"). The shares of the different regions in the CO_2 emissions resulting from the agreement are also presented, again for the EU-Mercosur region ("% contribution to global CO_2 from the agreement in EU-Mercosur") or for the world as a whole ("% contribution to global CO2 from the agreement by region").

Finally, the third and last block of this table examines the sectoral composition of CO_2 emissions in Mt and as a percentage. First, the sectoral breakdown is presented in Mt, both for the initial CO_2 emissions ("Year 0") and for those generated by the agreement ("Dif Year 16"). Then, in the last rows, we present the percentage structures corresponding to the metric Mt of this third block, both for the initial C02 emissions (pre-agreement) and for those amount of emissions caused by the agreement. Note that we also track emissions related to private consumption, which in many regions make a significant contribution to the total. These private consumption-related emissions come mostly from car fuels, although in some economies, such as Argentina, cars mostly use gas, which is also linked to significant CO_2 emissions. A second important source of emissions related to private consumption is the use of gas for cooking and heating.

Let us now analyze the results. The first block shows that the agreement would lead to a small increase in CO_2 emissions among all signatories (0.14% in year 16), compared to the initial level of emissions (column "Total EU and Mercosur"). This 0.14% is lower than the increase in GDP of that region (0.17%), which implies an improvement in the

[2] The variables in absolute terms in this study have been projected from 2019 to 2023.

"emissions/GDP" ratio of the EU-Mercosur region. The improvement in this ratio is 16.22% (0.14%/0.17%). Our methodology for calculating emissions follows the evolution of the demand for fossil fuels (coal, natural gas and refined oil) by both the different productive sectors and the final demand of the economy, in particular private consumption. Our emissions calculations thus reflect the change in economic structure and demand that the agreement brings about. Although the agreement produces more exports and imports and CO_2 emissions from transport increase, the overall effect on the ratio of emissions per GDP improves in the EU-Mercosur region, as we have just pointed out. In fact, it can be observed that all regions that are signatories to the EU-Mercosur agreement improve their emissions-to-GDP ratio, with the sole exception of Brazil. This occurs to the greatest extent in Argentina (-50.92%), followed by Paraguay (-37.49%), EU26 (-23.29%) and Uruguay (-22.52%), Spain (-16.68%). Brazil experiences an increase in the emissions/GDP ratio of 17.73% which, however, is compensated by the improvements in the rest of the signatories in its own region (Mercosur), also at the global level and also in the group of signatories as a whole. Before analyzing the evolution in each of the regions in more detail, it should be remembered that this analysis only takes into account CO_2 emissions. Therefore, the change in non- CO_2 emissions (changes in other greenhouse gases), which are important in the agricultural sectors, are not included here. However, in the EU27, 80% of greenhouse gases come from CO_2 (LSE, 2020).

If we add the rest of the world region to the above percentages and look at the impact on the world as a whole, the increase in CO_2 emissions is 0.01%, while global GDP increases by 0.03%. Again, the agreement means an improvement in the emissions/GDP ratio for the world as a whole of 57.82%. The Rest of the World region has a negative percentage change in both GDP and CO_2 emissions of -0.005 and -0.001%, respectively, implying a worsening of its own emissions-to-GDP ratio. But this is because this region is more emissions intensive than the rest of the regions and, as the agreement reduces activity in this region, it contributes to a reduction in the world's emissions-to-GDP ratio. In other words, because the trade agreement shifts the region's economic activities from the rest of the world to the "EU-Mercosur" region, the world's emissions-to-GDP ratio improves. In fact, in block 2 of Table XX, it is shown that the initial contribution of the rest of the world to global CO_2 emissions is 90.05%. And the next row shows that the agreement in year 16 leads to a positive contribution from less activity in the rest of the world, which is a -6.62% reduction of CO_2 emissions in global CO_2 emissions in the world.

The 0.14% increase in emissions in the EU-Mercosur region due to the agreement corresponds to an increase in CO_2 emissions of 4.97 Mt (first row of the second block column "Total EU and Mercosur"). The EU's contribution to the increase in emissions is higher than that of Mercosur. The contribution of Spain and the EU26 is 9.95% and 49.57% to the increase in total emissions in the EU-Mercosur region, respectively. Brazil is the next largest contributor with an overall increase in emissions of 1.46 Mt, accounting for 29.41% of the increase in emissions in the EU-Mercosur region. The rest of the Mercosur countries make much smaller contributions.

In Spain, the increase in CO_2 emissions is mainly attributed to the services sectors (0.23 Mt out of a total of 0.49, accounting for 46.38% of the total), in particular the electricity sector and air transport, which are emission-intensive. Although the production of the agricultural sectors in Spain decreases (and therefore their emissions decrease), they are

relatively small in the Spanish economy so their impact on total emissions is limited (-0.84% decrease in the contribution to emissions in the total agricultural sector). Patterns related to private consumption are found to have a stronger impact than manufacturing production (0.18 vs. 0.09 Mt, accounting for 36.62% of total emissions linked to private consumption vs. 17.84% for manufacturing). As mentioned above, emissions related to private consumption come mostly from the fuel we use for cars and the use of natural gas in households.

In the rest of the EU, the general pattern is similar to that in Spain. Most emissions are produced by services (1.22 Mt metric tons, 49.66% of the total), although private consumption also makes a considerable contribution (1.06 Mt, 43.13% of the total), again exceeding that of manufacturing.

We now turn to the Mercosur countries. Much of the debate on the agreement focuses on agriculture, in particular emissions from beef in Brazil. There is no doubt that avoiding deforestation in the Amazon is a crucial issue. However, it seems necessary to point out that, in terms of CO_2 emissions, the emphasis should not be on the agricultural sectors. As can be seen from the sectoral contribution percentage in the last rows of Table XX, agriculture accounts for 8.53% (0.12/1.46) of the final share of CO_2 emissions in Brazil in Year 16. In fact, the first rows of block 3 show that the increase in CO_2 emissions in agriculture of 0.12 Mt is considerably smaller than the increase recorded in services (0.84 Mt) or in manufacturing (0.30 Mt).

In Brazil, services produce the largest increase in emissions with 57.09% of the total. Increased production in other service sectors, the electricity sector and the water transport sector are mainly responsible, as they are emission intensive sectors in the Brazilian economy. It should be noted that, although hydropower is dominant in Brazil, fossil fuels (natural gas and oil derivatives) still have some shares in electricity generation. Next in importance are emissions related to manufacturing (20.61%), followed not far behind by private consumption (13.77% of the increase in emissions). All in all, Brazilian agriculture is the part of the economy that contributes the least to CO_2 emissions (8.53%). Although not shown in Table 4.1, Brazil's bovine sector (which includes both cattle, sheep, goats and horses, as well as their corresponding manufactures) increases emissions by 0.02 Mt, accounting for 1.31% (0.02/1.46) of these increased emissions. Sugar and other animal products also contribute to agricultural CO_2 increases. It is also interesting to note that other sectors such as cereals, which are also emission-intensive, with a sensitive product such as soybeans, increase their emissions by 0.03 Mt, accounting for 2.3% of total emissions in Brazil.

In Argentina, services are the sector in which emissions increase the most after this agreement (36.51% of the total). It is followed in importance by agricultural emissions (34.48% of the total). In Paraguay, electricity generation is already almost emission-free. In this country, the increase in CO_2 emissions is basically attributed to the increase in private consumption, which accounts for 78.43% of the increase in emissions. In Uruguay, the service sectors and private consumption account for 45.71% and 39.03%, respectively.

Finally, in the Rest of the world, due to lower activity, there is a decrease in CO_2 emissions, which is mainly due to the decrease in private consumption (-0.48 Mt out of a

total of -0.31, which brings about a 157.01% reduction in emissions in this region, which together with the fall in emissions in agriculture and manufacturing, -0.06 and -0.27 Mt, more than offset the increase in emissions from services (0.50 Mt metric tons).

It is important to note that this calculation is based on currently available information on production and consumption patterns, which underlie our simulations. However, given countries' commitments to the Paris Agreement and the European Green Deal, production techniques and consumer habits can be expected to become much "cleaner" in 16+ years.

Moreover, the agreement itself can also contribute to the exchange of better technologies. Indeed, the agreement can favour access to cleaner energy for all signatories. As the LSE (2020, p. 96) states: “Reducing non-tariff barriers on environmental goods and services can help increase access. More trade can increase competition and induce more innovation”. In fact, the EU has much higher figures than Mercosur for climate change-related patents, with more than 1,200 per million inhabitants. On the Mercosur side, Brazil is the country that contributes the most patents in this field (24 per million inhabitants), followed by Uruguay with 12 and Argentina with 10, over the last 10 years, with no data available for Paraguay. The LSE (2020) concludes that the agreement could represent an opportunity in terms of cooperation for knowledge and technology transfer and thus contribute to environmental objectives. One of the pillars of the agreement is precisely cooperation.

3.3 Main Trade results

Table XXX shows the impact of the Agreement on total imports for the European side of the agreement. It will enable us to analyze the imports of the EU27, that is, the sum of the EU26 region of our model and the Spanish region together. Given the interest that certain sensitive products have justifiably aroused, it seems relevant to offer the impact we derive for them at the global level on the EU27 side. In addition, we retain the information for the four Mercosur countries for greater depth.

Table XXX presents two types of percentages referring to Year 16 of the agreement, distributed in two blocks of columns. The first block is on the left side of the table and is titled "Sectoral share (in percent) in total imports of each region in EU27 (EU26 and Spain)". In other words, we are talking about the sectoral distribution of imports coming into the EU27, being measured in the total EU27 imports from each region. These percentages are calculated by dividing the absolute value of EU27 imports per region in a given sector by the total EU27 imports from that region. Therefore, the last row referring to the total of sectors has 100% per region. Logically, this 100% coincides with the sum of total agricultural, manufacturing and services imports by region, which also appear in the last rows. In reality, the percentages of EU27 imports by sector and region are exactly the same as the sectoral distribution of that region's exports to the EU27.

The first column of each block ("Mercosur") shows the total imports of the 4 countries, which are presented in the following columns disaggregated one by one. The "EU27" column shows intra-European trade, i.e. between the 27 countries that make up the EU. The "Rest of the World" column shows imports from the EU27 that do not come from either Mercosur or the EU27. The "Extra-EU27" column shows the sum of EU27 imports

from Mercosur and the rest of the world at the same time. Finally, the column "Total EU27" indicates total EU27 imports, including both extra-EU27 and intra-EU27 trade simultaneously.

The second block of results on the right in Table XXX are the "regional share in imports of each sector in EU27 (EU26 and Spain)", as it reflects the weight of each region in total EU27 imports by sector. Its data is therefore calculated by taking each region's imports in the sector indicated by the row and dividing it by total EU27 imports in that sector. Again, the calculations are for year 16, like all the ones that appear in this table. In this block we can clearly see how most EU trade will continue to be intra-European, following the EU-Mercosur agreement. In fact, the "EU27" column dictates that 51.25% of EU27 imports come from the EU27 itself, while the Rest of the World accounts for 47.58%. The four Mercosur countries that we present together in the "Mercosur" column and then one by one, account for the remaining 1.17% of EU27 imports. The share is higher in agricultural products with 4.78% of total agricultural imports. But, as we are going to explain, we should not infer from this that the bulk of trade in this agreement is made of agricultural products.

It has been said that the EU-Mercosur Agreement is basically an exchange of "cars for cows". This seems like an oversimplification, but let us analyze this in detail. If we look at the aggregates by sector of the left block in Table XXX, we observe that the bulk of EU27 imports from Mercosur (or exports from Mercosur to the EU27) are concentrated in manufactures. The column "Mercosur" in its row "Total manufactures" indicates that of the total EU27 imports from Mercosur, 59.62% are manufactured products. By country, 63.87% of Brazilian exports are manufactured goods and for Argentina, Paraguay and Uruguay the percentages are 53.54%, 30.25% and 37.09%, respectively. By contrast, for the four Mercosur countries as a whole, agriculture accounts for 14.96% of total EU27 imports and services for 25.42%. It is clear that services are much more important than agricultural flows from Mercosur. Continuing with the left side of Table XXX, we see that the beef sector contributes only 3.75% of total EU27 imports from Mercosur. The sector with the greatest weight in these imports is "other food" with 11.80% of the imports received in the EU27 from Mercosur. It is interesting that business services mobilizes a very similar bulk of imports from Mercosur (11.43%), accounting for 11.80% of imports from Brazil and 11.33% of imports from Argentina, with imports from Paraguay (6.83%) and Uruguay (8.72%) also accounting for a very significant share. In the cereals sector, including soybeans, imports would account for 4.51% of total imports from Mercosur. However, the bulk of imports from Mercosur, as already mentioned, are concentrated in manufactures, with 59.62% of total EU27 imports from Mercosur. This agreement thus provides opportunities for Latin American countries that go beyond agriculture.

Although beef imports from Brazil account for only 1.87% of the total imports that the agreement will mobilize in that country, in terms of total EU27 imports in this sector, the percentage coming from Brazil is 4.55%[3]. This gives an idea of the important size of this sector in Brazil. This last percentage of 4.55% is shown in the right-hand block of Table

[3] It should be noted, though, that our model results are that the increase in production in the beef sector in Brazil after the full implementation of the agreement is of 1.66%.

XXX, which indicates the regional share of EU27 imports in each sector. Bovine imports from Argentina account for slightly more than 4.55% of Brazil, namely 4.84%. This leads us to an important conclusion: once we add to this 4.84% from Argentina, 0.36% from Paraguay and 2.92% from Uruguay, in the total EU imports in this sector, we obtain that the greatest mobilization of cattle in the agreement will not come from Brazil (4.55%) but from the sum of the rest of the Mercosur members (4.84%+ 0.36%+2.92% = 8.12%). The total from Mercosur in this sector is 12.66%. However, the largest supplier of beef imports will be the EU27 itself, with more than half of the imports (67.41%). If we look at the total of all sectors, it is clear that Brazil would continue to be the main supplier among Mercosur countries after the agreement. Of the 1.17% share of imports into the EU27 from Mercosur, 0.84% comes from Brazil.

Conclusions

This paper offers an analysis of the EU-Mercosur agreement covering not only tariffs, quotas and non-tariff barriers to trade. It also offers the impact on non-tariff measures to FDI and the openness of public procurement to exports and FDI.

Our methodology is based on an advanced general equilibrium analysis, which includes several manufacturing sectors operating in a Melitz (2003) framework and multinationals in services sectors operating à la Krugman (1980). This allows us to capture two real-world effects: 1) The existence of firms with different sizes, costs, productivities and prices within each sector, which generates endogenous variations in productivity when barriers to trade go down; and 2) The ability to capture firms opening or closing, or moving from serving one foreign market to serving another. In other words, Melitz captures variations not only in the intensive margin of international trade (variations in its intensity for a given origin or destination), but also in the extensive margin (or changes in the number of countries of destination or origin of trade flows). In addition, in order to be able to offer the impact on jobs after the agreement, we have introduced a wage curve (Oswald---] as well as frictions to the movement of labor, in line with the work of Balistreri et al. (2018; 2016).

Our simulations draw on a careful study of the chapters of the agreement in principle and in the annexes of tariffs reductions and quota schemes. We have also updated the trade data available to include the averages of trade in goods in the years 2017-2019. Not all the impacts of a deep trade agreement can easily be quantified, however. The EU-Mercosur Association Agreement is an ambitious deal which covers intellectual property protection, facilitation of the movement of professionals, sustainability issues, digital trade, bilateral safeguards, defense of competition, customs cooperation, trade facilitation, dispute settlement, state-owned enterprises and Small and Medium Enterprises (SMEs), among others. The protection of Geographical Indications or the elimination of non-automatic licenses cannot be translated into economic impacts, but they help firms in the difficult task of being profitable in foreign markets.

Even more important, our results point out that the agreement would be beneficial for all signatories, generating larger gains for the Mercosur countries. Paraguay and Uruguay would benefit the most, while Argentina and Brazil would also experience sizeable gains.

From a geostrategic point of view, strong EU-Mercosur ties would be an asset in themselves. The world vision of partners and allies deserves close attention in a post-covid scenario and after the Russian invasion of Ukraine. The EU is pioneering the commitments with respect to sustainability and more advanced social and labor standards. The Green Deal has been reinforced by the Next EU generation recovery plan, which devotes 30% of the EU funds to fighting climate change (European Commission, 2022a; 2022b).

Our results are in general more positive and larger than the ones previously derived in the studies of this agreement. Going beyond the perfect competition framework allows us to capture additional benefits from trade. In addition, FDI and public procurement are sources of additional gains. The agreement would help the signatories to turn their economies into cleaner ones promoting specialization in sectors with more value added and which are less intensive in CO_2 emissions. Overall, the agreement produces a larger increases in GDP than in CO_2 emissions.

This agreement is not "an exchange between cars and cows", as some have described it. Behind the overall increase in CO_2 emissions, 50.1% are generated by services sectors of all the signatories. 31.8% arise from private consumption (such as fuels used for cars and central heating). 14.1% is related to manufacturing production and *only* 4.0% to agriculture production. With respect to trade flows from Mercosur to the EU, after the full implementation of the agreement, 59.6% would be manufactures, 25.4% services and *only* 15.0% agricultural goods. Flows related to the bovine sector would not even reach 3.75% of trade flows, while we estimate that production in Brazil would go up by 1.7% in this sector. The European Commission has carefully negotiated the quotas in the agricultural sectors and those concerned about the Amazonia should think more about the trade flows directed to China than the ones going to the EU.

The agreement is also a force for jobs creation. Our explicit modelization of unemployment allows us to provide the first estimations, to the best of our knowledge, on the employment creation this deal would generate. GDP growth and job creation are among the most efficient ways to fight inequality and poverty,

Finally, a possible extension of this analysis could be to cover other Green House Gases beyond CO2. This could be done along the lines of our previous analyses (Beck, Rivers, Wigle and Yonezawa, 2015). Methane and nitrous oxide are other important Green House Gases related to agricultural sectors. However, we should bear in mind that output expansion in the Mercosur countries are limited after the full implementation of the agreement and at least partly compensated by reductions in European agriculture production.

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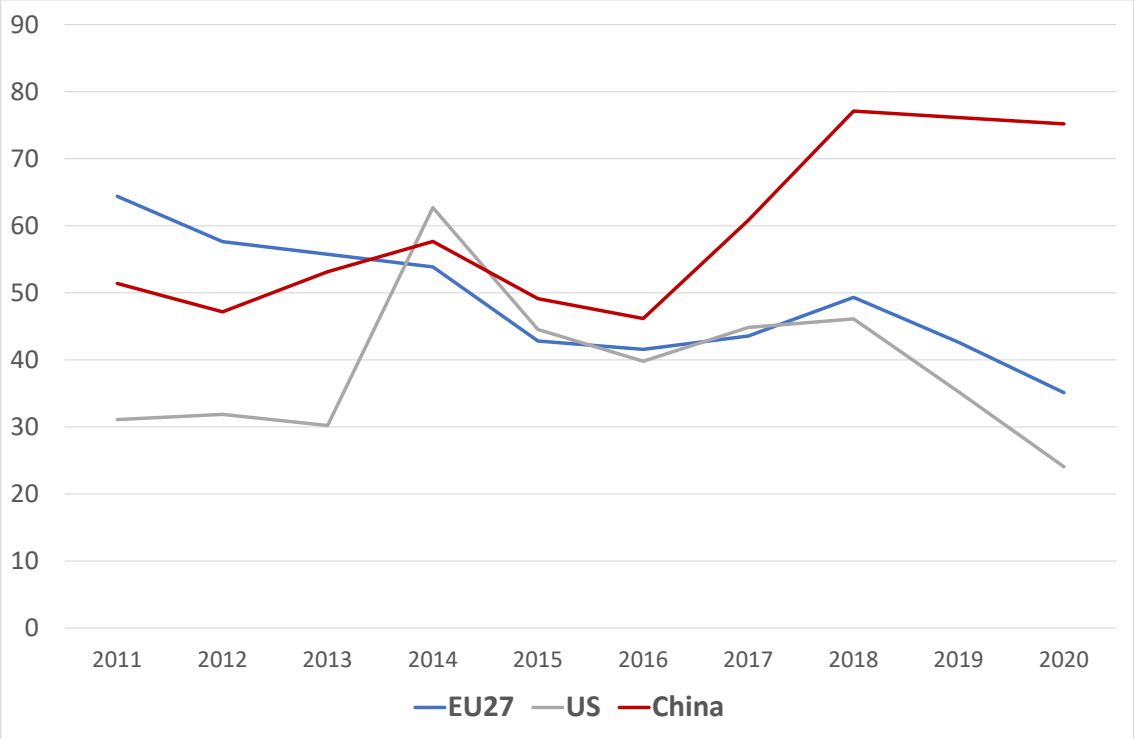
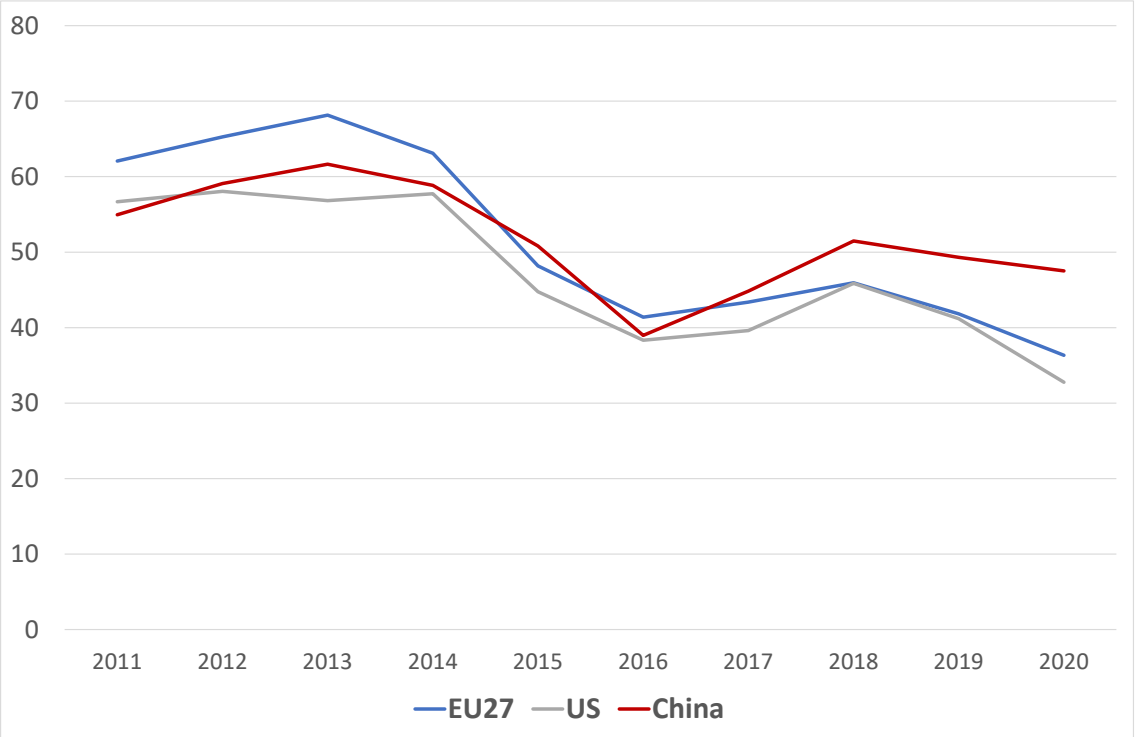
Figures and tables

Figure 1. Mercosur goods exports by main destinations (thousands of millions of $)



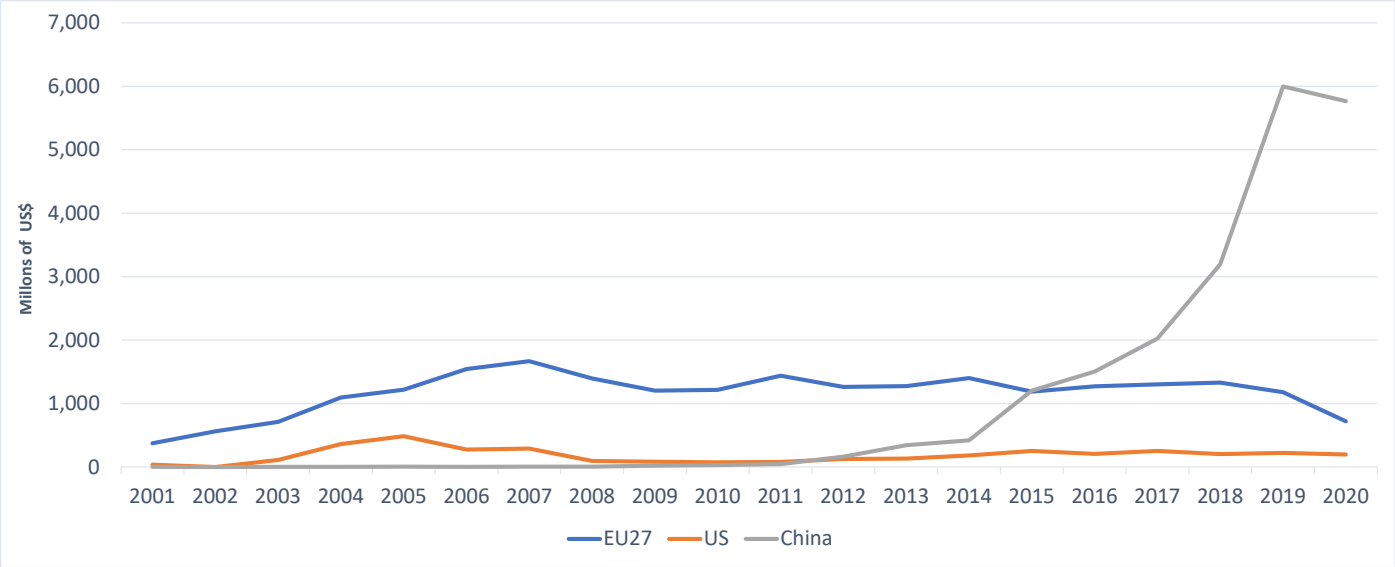
Source: TradeMap (ITC, 2021a)

Figure 2. Mercosur goods imports' by main origins (thousands of millions of $)



Source: TradeMap (ITC, 2021a)

Figure 3. Bovine exports from Mercosur



Source: TradeMap (ITC, 2021a)

Table 1. Size of EU agreements with Canada, Japan and Mercosur (2022)

EU Agreement with:	Population (in millions)	Population (% of world)	Joint GDP (in trillions)	Joint GDP (% of world)	Exports (% of world)	Imports (% of world)	Tariff savings
Canada	485.8	6.3	15.5	18.9	34.0	32.4	0.54
Japan	573.6	7.4	18.3	22.3	35.4	33.8	0.9
Mercosur	716.3	9.2	16.2	19.9	33.3	31.5	3.6

Source: Authors' elaboration based on the World Development Indicators (WorldBank, 2022).

Note: The UK is not included in these calculations.

Table 2. Impact on main macroeconomic variables (% change with respect to initial values and thousands of millions of $ for consumption)

	GDP	**Consumption**	**Exports**	**Imports**	**Employment**	**CO_2**
EU27	0.13	0.21	0.23	0.25	0.06	0.10
Argentina	0.48	0.86	4.04	5.04	0.31	0.24
Brazil	0.30	0.65	4.69	4.11	0.24	0.35
Paraguay	1.21	1.51	-0.12	1.45	0.24	0.75
Uruguay	1.66	2.51	2.90	4.20	0.58	1.29
Rest of the World	-0.005	-0.008	-0.038	-0.029	-0.002	-0.001

Source: Authors' estimations.

Table XX. Comparison of macroeconomic results with other studies of the EU-Mercosur agreement

(% de variación respecto al nivel inicial o miles de millones de euros)

Estudy, methodology	Scenario	Area	GDP	Welfare	Imports	Exports
London School of Economics (2018, 2020), CGE	Conservative	EU28	0,10%	6,30[1]	0,90%	0,40%
	Ambitious	EU28	0,10%	8,60[1]	1,10%	0,60%
Carrico et al. (2020), CGE	Unique	EU27[3]	0,02%	-	-	-
Timini y Viani (2020), gravity equation	Central (Scenario 1)	Several EU countries	-	-	[-0,03% - 1,29%][4]	[-0,06% -1,44%][4]
Sinabell, Grübler y Reiter (2020), gravity equation	Central	Several EU countries	[0,03% - 0,157%][5]	-	-	[1,607% -4,115%][5]
This paper, CGE	Central	EU27	0,12%	0,19[6] ($9,012.1)	0,24%	0,23%

Fuente: Authors' elaboration.

Notes:

[1] In billions of 2011 euros. The welfare measure chosen is not indicated.

[2] Separates skilled and unskilled workers, although the change is numerically equal in both, to one decimal place.

[3] EU27 includes the United Kingdom, but not the Netherlands.

[4] Range of impact variation for the following countries: Austria, Belgium, Czech Republic, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Sweden.

[5] Range of variation of impact among all EU28 countries, i.e. all EU27 and UK.

[6] Percentage change in equivalent consumption and absolute value in thousands of millions of dollars.