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# A highway across the Atlantic? Trade and welfare effects of the EU-Mercosur agreement☆

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ABSTRACT

In this paper we analyze the EU-Mercosur agreement and predict its effects on trade and welfare using a general equilibrium structural gravity model. First, we exploit the detailed provision-level information available for the EU-Mercosur agreement to identify partial equilibrium trade effects of existing treaties with similar set of provisions. In a second step, the estimated increase in trade is mapped into reductions in bilateral trade costs and imputed to EU-Mercosur country pairs to compute the general equilibrium effects of the agreement in terms of trade creation, trade diversion, and welfare effects. Our results indicate that the positive effects on trade and welfare stemming from the EU-Mercosur agreement are likely to be economically important, especially for Mercosur countries, and substantially heterogeneous both between and within the two blocs.

## 1. Introduction

In July 2019, the European Union (EU) and the Southern Common Market (Mercosur) reached an agreement in principle on a bilateral trade treaty, intending to enhance economic integration between the two areas. The agreement will only enter into force after the ratification by all parties involved, and is particularly ambitious. It implies the elimination of tariffs on a large share of trade in goods, and a number of significant provisions on a variety of trade and non-trade related aspects, such as non-tariff barriers, public procurement, labor markets and environmental protection. In this sense, the treaty is expected to substantially reduce bilateral trade costs between two of the world's biggest regional blocs. However, there are still some questions pending: by how much will the EU-Mercosur agreement affect trade flows and welfare in member countries? Will its impact be heterogeneous across countries? Will the treaty generate trade diversion?

We answer these questions by exploiting the latest advances in structural gravity models. These types of models allow assessing and quantifying trade and welfare impacts of a certain agreement *ex-ante*, that is, before entering into force. Namely, gravity estimations of the partial effects of similar, existing, trade agreements on bilateral trade flows (that is, the trade effect of certain trade agreements after entering into force) can be inserted in a theoretically-consistent general equilibrium model to ascertain the general equilibrium trade

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and welfare effects of the agreement.

Since the beginning of the EU-Mercosur negotiations, a number of studies analyzed the trade and welfare impact of reaching an agreement. Having been performed before the July 2019 "agreement in principle", most of the previous literature had to assume the extent to which the agreement would liberalize trade. Some assumed the treaty would imply the complete elimination of all tariffs on goods (Diao et al., 2003; Boyer and Schuschny, 2010; Philippidis et al., 2014) and service trade (Kirkpatrick and George, 2009). Others consider more complex scenarios, exploiting previous proposals made by the two parties (Burrell et al., 2011). These earlier efforts largely rely on partial or (computable) general equilibrium models, where tariff reductions have to be inserted. Results show substantial variation depending on the assumptions made and model used, and range from rather high welfare gains for both areas to even negative welfare effects for the EU.

In this paper, we analyze the EU-Mercosur agreement and predict its effects on trade and welfare using a general equilibrium structural gravity model. Using this approach, we combine recent advances in the field of structural gravity models – including domestic trade and accounting for trade agreement heterogeneity (by exploiting their features beyond tariff reductions, such as provisions on investment, services provision, public procurement, labor market, environment, etc.)[1] – with the information contained in the "agreement in principle", to obtain country level estimates. Indeed, first, we exploit the detailed provision-level information available for the EU-Mercosur "agreement in principle" of July 2019 to identify partial equilibrium trade effects of existing treaties with similar sets of provisions (in the text, we will refer to this group of treaties as "EU-Mercosur like" agreements). In a second step, the estimated increase in trade is mapped into reductions in bilateral trade costs and imputed to EU-Mercosur country pairs to compute the general equilibrium effects of the agreement in terms of trade creation, trade diversion, and welfare effects.

Our results show the potential trade and welfare effects of the EU-Mercosur agreement, and their heterogeneous distribution. Mercosur countries are expected to experience the largest gains from trade. In our reference scenario, exports increase by 7%, imports by 8%, and welfare by 0.2%, on average. The gains for EU countries are expected to be much smaller (+0.3% in exports and imports; <+0.1% in welfare). These substantial differences arise from the different relevance of bilateral trade shares (between Mercosur and the EU) – quite pronounced in the case of Mercosur countries, much more limited for EU economies. Among the latter, countries that either had stronger previous trade linkages with Mercosur (like Spain and Portugal) or small open economies (like Belgium and the Netherlands) will experiment the highest benefits. Indeed, the model shows larger trade-to-welfare transmissions for small (open) economies, since the relevance of the external demand is relatively higher than for those economies that rely on a larger internal market. These findings imply that the impact of the treaty will be strongly heterogeneous, both between and within blocs. Trade diversion effects (i.e., on third-countries trade) are practically inexistent.

The contribution of the paper fits into a line of research that looks at the effects of trade agreements and rests on the detailed analysis of the EU-Mercosur agreement. First, to the best of our knowledge, earlier efforts estimating the potential trade and welfare effects of the EU-Mercosur agreement did not incorporate both international *and* intra-national – i.e. domestic – trade flows (one of the latest advances in structural gravity modelling), to take into account the changes in the relative costs of selling internationally rather than domestically (Yotov, 2012; Yotov et al., 2016; and Borchert and Yotov, 2017). Second, earlier efforts took place prior to the new "agreement in principle" of July 2019,[2] and therefore rested on less well informed simulations. Third, earlier efforts did not study the impact of the EU-Mercosur agreement on individual EU economies.

The remainder of the paper is organized as follows: Section 2 examines the main features of the EU-Mercosur agreement and relevant studies concerning this issue; Section 3 describes the theory and empirical strategy (partial and general equilibrium structural gravity models); Section 4 describes the data used; Section 5 discusses our main (partial and general equilibrium) results; Section 6 concludes.

## 2. The EU-Mercosur agreement: features and previous studies

### 2.1. Main features of the EU-Mercosur agreement

It took almost twenty years of negotiations to reach the July 2019 "agreement in principle" between the EU and Mercosur concerning a new trade treaty between the two areas.

The EU-Mercosur agreement contains a wide range of reductions in trade policy related costs, including both tariffs and non-tariff measures (NTMs). On one side, it prescribes the phasing out of tariffs on almost all goods traded between the two areas. Similar to what stipulated in other trade agreements (e.g. EEC, NAFTA), the phase out of tariffs (that is, the phase in of the trade agreement) corresponds to a 10-year period. The EU will eliminate tariffs on 95% of the goods imported from the Latin American bloc. Mercosur countries, in turn, will eliminate tariffs on 91% of the goods imported from the EU. For certain "sensitive" products (e.g. meat, rice, sugar), the EU will apply a partial liberalization through a system of tariff quotas (consisting in applying different tariffs depending on the amount of imports reached). To another small set of goods (mainly dairy products) a reciprocal system of tariff quotas will apply.

The treaty also contains a comprehensive set of clauses and provisions, reducing non-tariff measures (NTMs) and dealing with a

[1] See, e.g., Mattoo et al. (2017); Kohl (2014); Kohl et al. (2016); Brandi et al. (2020); Timini et al. (2020).

[2] The agreement in principle has been published by the European Commission (Directorate General for Trade) in its webpage: https://trade.ec.europa.eu/doclib/press/index.cfm?id=2048. As stated by the European Commission, "The texts will be final upon signature. The agreement will become binding on the Parties under international law only after completion by each Party of its internal legal procedures necessary for the entry into force of the Agreement (or its provisional application)". This is the last (and close-to-final) version agreed by the two negotiating parties. The agreement in principle contains information on the text of the agreement and the chapters/provisions included.

variety of other (sometimes non-trade) issues. Among other things, it simplifies customs processes, removes technical barriers to trade, and includes a commitment of the signatory parties to create the conditions for increasing convergence in existing and future technical regulations.

Moreover, the agreement includes non-discrimination clauses, which prohibit foreign suppliers from being subject to more stringent rules and requirements than those applied to national suppliers, targeting in particular postal and courier services, telecommunications, financial services and maritime transport services. It also provides for reciprocal access to public procurement markets. This represents an unprecedented opening for Mercosur economies, which, not being part of the WTO plurilateral agreement on public procurement processes (WTO Government Procurement Agreement), had not allowed foreign companies access to date. Indeed, European companies have been able to participate in public procurement processes only by acting through their subsidiaries directly located in Mercosur countries.

The treaty also includes labor and environment related provisions, binding the parties not to lower labor and environmental standards with the purpose of promoting trade or attracting investment. For example, on the labor side, the agreement guarantees workers' freedom of association, the right to collective bargaining and non-discrimination at work. On the environment side, it foresees, among other things, the commitment to implement the Paris agreement against climate change.

The relevance of the agreement at the global level is significant, since the areas involved are jointly responsible for 25% of global GDP – a percentage similar to that covered by other treaties recently signed by the EU. On the other hand, the agreement with the EU is the most relevant signed by Mercosur to date. Its previous trade treaties jointly cover only 7.4% of world GDP.[3] From Mercosur's perspective, the agreement is also the first that regulates trade in services, which, as shown by the literature, can also have positive feedback effects on goods trade.[4]

### 2.2. Previous studies on the EU-Mercosur agreement

Since the negotiations for a EU-Mercosur trade treaty started, various studies have analyzed its potential trade and welfare impacts. Table 1 compares the results of earlier efforts.

From a methodological point of view, modelling the new agreement within a general or partial equilibrium setup (to quantify its trade and welfare effects) represents a challenge. In this respect, all previous studies on the EU-Mercosur treaty modelled the agreement by directly including expected tariff changes in a specific partial or general equilibrium model. However, this method better fits simulations related to the effects of tariff changes only, rather than those including other non-tariff measures, such as those concerning service trade, technical barriers to trade, investment, public procurement, labor markets, and environmental protection. While these measures are included in most modern trade treaties, calculating their tariff equivalent is not obvious. Indeed, as emphasized by the literature, tariff-equivalent estimates of non-tariff barriers tend to be highly sensitive to small variations in the methodology.[5] This is of particular importance in the case of the EU-Mercosur treaty, since non-tariff measures are an integral part of the agreement.

Consequently, earlier efforts have focused on simulating the agreement as the full liberalization of goods trade (that is, the elimination of all tariff barriers). Their results vary widely depending on the model, and range from rather high welfare gains for both areas to even negative welfare effects for the EU. The highest welfare gains from the agreement, for both the EU and Mercosur countries, were estimated by Diao et al. (2003), who employed a Computable General Equilibrium (CGE) model that allows taking into account both the static (stemming from a more efficient resource allocation, lower import prices and higher employment) and dynamic (in the form of a higher TFP) gains. The model employed, coupled with the bold liberalization scenario assumed, leads the study to estimate an increase in GDP of 0.3% for the EU and of 2–4.4% for Mercosur countries, associated with a rise of 0.5–0.6% in EU trade flows and of 3–8% in Latin American flows. Boyer and Schuschny (2010) results are at the opposite end of the spectrum. Based on a CGE that takes into account only static gains, they find that a potential agreement with full liberalization in goods trade could generate negative welfare gains for European economies – a 0.2% decrease in EU GDP driven by adverse terms-of-trade movements – while increasing Mercosur economic activity.

To the best of our knowledge, our paper is the first to study the EU-Mercosur agreement trade and welfare impacts by using an alternative, econometric-based, method, avoiding the aforementioned challenges related to the direct inclusion of tariff changes (or the tariff-equivalent of non-tariff measures) into a CGE model. Our approach follows Baier et al. (2019b), consisting in a two-step model. First, we estimate the initial partial equilibrium impact of the EU-Mercosur agreement on bilateral trade flows using a structural gravity model. Namely, we quantify the impact of the agreement on bilateral trade flows by estimating gravity equations that relate bilateral exports to their fundamental determinants –including the presence of a "EU-Mercosur like" trade treaty in force between a pair of countries. Second, we insert the impact of the treaty on bilateral exports estimated through the partial equilibrium model in a general equilibrium model, as a reduction in bilateral trade costs. The latter, in turn, affects multilateral trade resistances, expenditure and output.[6] One advantage of this approach is that its first, gravity-based step allows estimating the impact on trade of a set of treaties already in force whose provisions are similar to those included in the EU-Mercosur one –including measures regarding goods and service

[3] Currently Mercosur only notified to the WTO the following agreements: Mercosur-Egypt (Free Trade Agreement), Mercosur-Israel (Free Trade Agreement), India (Partial Scope Agreement) and with the Southern African Customs Union (Botswana, Lesotho, Namibia, South Africa and Eswatini) (Partial Scope Agreement).

[4] See Blyde and Sinyavskaya (2007).

[5] See Fugazza and Maur (2008) for more details.

[6] The next section explains more in detail the gravity-based approach.

**Table 1**
Studies on the EU-Mercosur agreement.

| Authors | Year | Methodology | Assumptions on trade liberalization | Type of gains | Impact on trade (a) | Impact on welfare |
|---|---|---|---|---|---|---|
| **Diao, Díaz-Bonilla and Robinson (b)** | 2003 | General equilibrium model (CGE) | Full trade liberalization (elimination of all tariff barriers) | Static (resource reallocation, employment) and dynamic (TFP) | EU15: X: +0.5%; M: +0.6%<br>ARG: X: +8.1%; M: +7.8%<br>BRA: X: +7.5%; M: +4.2%<br>URY: X: +3.7%; M: +3.4% | EU15 GDP: +0.3%<br>ARG: +4.4%; BRA: +2.9%; URY: +2% |
| **Weissleder** | 008 | Partial equilibrium sectorial model (CAPRI) | (1) Partial liberalization on some agricultural goods;<br>(2) Full liberalization on all agricultural products | Static | Increase in Mercosur X of agri. goods to EU25. Detailed results on wheat, maize, rice, soybeans, beef, poultry and pork. | EU25 agri. income: −0.4%/−7%;<br>ARG: +0.4%/+11%<br>BRA: +0.3%/+9% |
| **Kirkpatrick and George (c)** | 2009 | General equilibrium model (CGE) | Full trade liberalization (elimination of all tariff and non-tariff barriers to goods and service trade) | Static (resource reallocation, import prices, wages) | EU25: X: +0.4%; M: +1.4%<br>Mercosur: X: +26%; M: +34% | EU25 GDP: +0.1%<br>ARG: +0.5%; BRA: +1.5%; PRY: +10%; URY: +2.1% |
| **Boyer and Schuschny** | 2010 | General equilibrium model (CGE) | (1) Full trade liberalization (elimination of all tariff barriers); (2) Exclusion of sensitive products | Static (resource reallocation, import prices, wages) | EU27: X: +0.06%/+0.5%;<br>M: +0.05%/+0.4%<br>Mercosur: X: +1.9%/+7,4%;<br>M: +2.7%/+13,7% | EU27 GDP: −0,08%/−0,2%;<br>Mercosur: +1,4%/+4,6%; |
| **Burrell** | 011 | General eq. model (CGE) and partial eq. sectorial model (CAPRI) | (1) Full EU liberalization of non-sensitive goods, partial Mercosur lib.;<br>(2) Higher EU lib. for agriculture, higher Mercosur lib. for manuf. | Static | EU27: X to Mercosur: +9–10%;<br>M from Mercosur: +3–4% | EU15 GDP: +0.02%;<br>Mercosur: +0.12%/+0.16% |
| **Estrades** | 2012 | General equilibrium model (CGE) | Full liberalization of goods trade and 3 alternative scenarios with exclusion of sensitive products | Static (resource reallocation, import prices, wages) | EU27: X and M: +0.4%/0.7%;<br>ARG: X: +2.4/3.8%; M: +5.6/3.6%<br>BRA: X: +6.8/15%; M: +9.4/21%<br>PRY: X: +8.9/14%; M: +11/17%<br>URY: X: +2.4/13%; M: +2.5/11% | EU27 cons.: +0.1/0.2%<br>ARG: +0/0.4%<br>BRA: +0/1.1%<br>PRY: +3.9/6.5%<br>URY: +0.2/4.5% |
| **Philippidis, Resano and Sanjuan (c)** | 2014 | Hybrid (CGE corrected with gravity model estimations) | Full liberalization of goods trade (with and without correction from gravity model) | Static (resource reallocation, import prices, wages) | Detailed results on agro-food, textiles, light and heavy manufacturing, meat, dairy, rice and sugar. | EU27 pc.inc: +0.05/0.1%<br>ARG: +0.7/1.2%<br>BRA: +0.8/2.9%<br>PRY: +2.9/4.1%<br>URY: +1.6/3.1% |

(a) X: exports; M: imports. (b) Mercosur is assumed to include also Chile and Bolivia; the EU is composed of 15 countries. (c) Mercosur also includes Venezuela.

trade, but also technical barriers to trade, investment, public procurement, labor and environment. This implies that, contrary to previous studies, we are able to consider in the general equilibrium model the partial equilibrium trade impact of the provisions included in the EU-Mercosur treaty.

Philippidis et al. (2014) also make use of gravity estimations. However, the main impact of the EU-Mercosur trade treaty on trade flows is derived through a more traditional approach, by directly embedding tariff changes into a CGE model. Gravity estimations are only used to apply a correction to the CES Armington aggregator of the tariff-fed CGE setup. In this way, the paper aims to reduce the "small share" bias, that is, the bias that arises from the linearity of the CES Armington aggregator embedded in the model, and may lead to underestimating increases in small trade flows. To this purpose, sectoral predictions on import shares from a battery of sectoral gravity models (with post-treaty tariffs equal to zero) are used to shock technological preference shifters in the Armington import demands of the CGE model. Results show an increase in EU per capita income of 0.05–0.1%, depending on the gravity correction being applied or not. These numbers ascend to 0.7–4.1% for Mercosur economies.

To the best of our knowledge, our paper is also the first to assess the effects of the EU-Mercosur agreement by explicitly taking into account the "agreement in principle" reached by the two blocs. Earlier efforts took place prior to the new "agreement in principle" of July 2019, and therefore necessarily rested on less well informed simulations. As explained above, some assumed the elimination of all tariffs on goods trade (Diao et al., 2003; Boyer and Schuschny, 2010; Philippidis et al., 2014) and on service trade (Kirkpatrick and George, 2009). Others considered more complex scenarios than a full liberalization. Burrell et al. (2011) simulated two alternative setups. The first corresponded to the agreement proposal made by the European Commission in 2004, envisioning the full liberalization of EU imports of non-sensitive agricultural products coupled with partial liberalization of Mercosur imports. The second corresponded to the offer made by Mercosur in 2006, involving a greater degree of liberalization for both EU and Mercosur imports. The partial liberalization assumption leads the study to estimate low welfare gains from the agreement. EU and Mercosur GDP increase only by 0.02% and of 0.12–0.16% respectively, depending on the specific scenario. Similarly, the CGE analysis carried out by Estrades (2012) shows that excluding sensitive products from a potential agreement can result in a significantly lower impulse for trade flows, especially for Mercosur countries. As an example, a setup with sensitive product exemption reduces Brazil's export growth by 7 percentage points (with respect to a full liberalization scenario), to 6%, driving to zero the welfare gains of the largest Latin American economy. Finally, Weissleder et al. (2008) focus on the agricultural sector (using a partial equilibrium model), unveiling that a partial liberalization of agricultural products imports would imply an increase in Mercosur exports to the EU, resulting in a contraction of EU agricultural income (up to 7%).

It is also important to notice that earlier efforts only estimate the impact of the EU-Mercosur treaty on the EU aggregate, rather than on individual European countries. Our paper is the first to study the effect of this agreement on individual EU economies, thus presenting evidence of potentially heterogeneous effects across EU economies.[7]

## 3. Structural gravity model: theory and empirical strategy

### 3.1. Theory

The literature on general equilibrium trade policy analysis has been expanding rapidly during the past few years. Most of these contributions share structural gravity as their foundations, and allow calculating the impact of trade policy on trade *and* welfare.

Our theoretical framework lies on the well-known "structural gravity" system of equations, as delineated by Anderson and van Wincoop (2003), Head and Mayer (2014) or Yotov et al. (2016):

$$X_{ijt} = \frac{Y_{it}E_{jt}}{Y_t}\left(\frac{\tau_{ijt}}{\mathrm{P}_{it}\Omega_{jt}}\right)^{1-\sigma} \tag{1}$$

$$\mathrm{P}_{it}^{1-\sigma} = \sum_j \left(\frac{\tau_{ijt}}{\Omega_{jt}}\right)^{1-\sigma}\frac{E_{jt}}{Y_t} \tag{2}$$

$$\Omega_{jt}^{1-\sigma} = \sum_i \left(\frac{\tau_{ijt}}{\mathrm{P}_{it}}\right)^{1-\sigma}\frac{Y_{it}}{Y_t} \tag{3}$$

where $X_{ijt}$ corresponds to bilateral trade flows between the exporter $i$ and the importer $j$ at time t, including domestic trade flows ($i = j$) – a theory-consistent feature improving model estimates, particularly of trade policy variables (Dai et al., 2014; Heid et al., 2021). As suggested by Yotov et al. (2016), equation (1) associates bilateral trade flows ($X_{ijt}$) to exporter's and importer's (relative) economic mass $\left(\frac{Y_{it}E_{jt}}{Y_t}\right)$ and trade costs $\left(\frac{\tau_{ijt}}{\mathrm{P}_{it}\Omega_{jt}}\right)^{1-\sigma}$. The latter term is in turn composed by bilateral trade costs ($\tau_{ijt}$), and the so-called "multilateral trade resistances" (MTRs: $\mathrm{P}_{it}$, $\Omega_{jt}$, as per equation (2) and (3)), capturing exporter's international market access and importer's domestic competition (Fally, 2015).

[7] As a minor point, it should also be noted that we do not consider the United Kingdom as part of the EU-Mercosur agreement due to the consequences of Brexit on the geography of the EU "Common Commercial Policy".

The system of equations (1)–(3) can be complemented, allowing general equilibrium[8] responses to a change in bilateral trade costs to take place, e.g. the effect of the entry into force of a bilateral trade agreement.

From a policy-maker perspective, going beyond a partial equilibrium framework is important for several reasons. First, it may lead to significant changes in the estimated impact of a certain trade agreement on trade between its members.[9] Second, it allows estimating the impact of trade agreements on non-members, therefore exploring trade diversion effects (a consideration of particular importance for neighboring countries not involved in the agreement). Third, it provides the possibility of assessing the impact of a certain trade policy decision on welfare. Yotov et al. (2016), Head and Mayer (2014) and Costinot and Rodriguez-Clare (2014) offer state-of-the-art reviews of the latest developments and modelling choices.

As explained in Head and Mayer (2014) and Yotov et al. (2016), by imposing a market clearing condition to the system of equation (1)–(3),[10] and by relating the aggregate expenditure term $E_i$ to the nominal income term $Y_i$,[11] we obtain a general equilibrium structural gravity system.

In other words, in the model, trade changes obtained in the partial equilibrium setting (Equation (1)) can be mapped into changes in bilateral trade costs (i.e. changes in the bilateral trade cost parameter $\tau_{ijt}$). Given the inclusion of MTRs in the model, and that MTRs are affected by changes in the bilateral trade cost parameter $\tau_{ijt}$ (as it is possible to infer from Equation (2) and Equation (3)), changes in $\tau_{ijt}$ also affects third countries. The market clearing condition, in turn, makes possible that these changes feed into changes in the value of domestic production and expenditure. These changes, in turn, will feed again in the model, generating additional changes in trade and MTRs.

In this model – as well as in a wide set of trade models as demonstrated by Arkolakis et al. (2012) – it is possible to formulate the change in welfare derived from trade as follows[12]

$$\widehat{W} = \widehat{\lambda}_{ii}^{1/(1-\sigma)} \tag{4}$$

Equation (4) corresponds to the Arkolakis et al. (2012) formula, and indicates that we only need two "sufficient statistics" to calculate welfare gains from trade: $\widehat{\lambda}_{ii}$, the change in the share of exporter's $i$ domestic trade (relative to total trade) stemming from the "trade shock" inserted in the model (estimated in the partial equilibrium), and a trade elasticity measure ($\sigma$).[13]

Therefore, considering as given the trade structure present in the data, the final general equilibrium results are driven by two key parameters: first, the magnitude of the "trade shock", i.e., the change in bilateral trade frictions deriving from the trade policy change (in our case, the entry into force of a bilateral trade agreement); second, the trade elasticity.

This is a standard approach in the literature, being a one sector and one factor of production (labor) constant elasticity of substitution (CES) general equilibrium structural gravity model. Despite not accounting for a series of important factors (e.g. input-output linkages, asset accumulation, etc.), it is generally regarded as a model providing "benchmark trade and welfare estimates" of trade policy changes (Yotov et al., 2016; Baier et al., 2019a; Felbermayr et al., 2020).[14]

Similar approaches have been recently used to estimate or simulate the effect of other trade integration and disintegration episodes. For example, Baier et al. (2019b) simulated the implementation of the Transatlantic Trade and Investment Partnership (TTIP), an agreement negotiated (but not approved) between the US and the EU. El-Dahrawy Sánchez-Albornoz and Timini (2021) studied the potential trade and welfare effects of deeper trade integration and of episodes of trade disintegration in Latin America. Campos and Timini (2019) evaluated the effects of Brexit (that is, the UK exit from the EU). Mayer et al. (2019) translated into gravity language the "Cecchini report" (Cecchini et al., 1988), and assessed the benefits deriving from the EU Single Market. Baier et al. (2019a) simulated the disintegration of the North American Free Trade Agreement (NAFTA), while Campos and Timini (2021) provided an in-depth study of Mercosur.

[8] Following Head and Mayer (2014) classification, equation (1) represent "partial equilibrium". The system of equations (1)–(3) is called "modular equilibrium". In "general equilibrium" models (as opposed to "modular") "wages (and therefore GDPs) also adjust to trade costs". In Yotov et al. (2016) classification, "general equilibrium" corresponds to "full endowment general equilibrium" and "modular" corresponds to "conditional general equilibrium".

[9] Yotov et al. (2016) show that, in the case of NAFTA, general equilibrium forces can reduce the trade agreement effects on bilateral trade of its members by more than 30%.

[10] Market clearing corresponds then to: $p_{it} = \left(\frac{Y_{it}}{Y_t}\right)^{1/(1-\sigma)} \frac{1}{\alpha_i P_{it}}$, where $p_i$ is the factory-gate price for exporter $i$ products. Respectively, $Y_i$ and Y are exporter $i$ and world production. $\sigma$ is greater than one, and represents a trade elasticity measure. It identifies the "elasticity of substitution among goods of different countries" (Yotov et al., 2016). In turn, $\alpha_i$ is the preference parameter (implying a taste for variety).

[11] This corresponds to the following equivalence: $E_{it} = \xi_i Y_{it}$, where $\xi_i$ is an exogenous parameter, whose value determines whether exporter $i$ faces trade surplus ($0 < \xi_i < 1$) or a trade deficit ($\xi_i > 1$). In the particular case of $\xi_i = 1$ trade is perfectly balanced.

[12] In this model, the change in welfare corresponds to the change in expenditure relative to the change in a price index. This means that the term "welfare" corresponds to "real consumption". For a step-by-step demonstration of the Arkolakis et al. (2012) welfare formula derivation, please refer to Head and Mayer (2014) and Yotov et al. (2016). In their theoretical appendix, Campos and Timini (2021) also report the full derivation.

[13] Please refer to Appendix A for a formal description of the model.

[14] On a related note, as brilliantly summarized by Baier et al. (2019b), this approach allows to consider all kinds of trade policy related reductions in bilateral trade costs without having to rely on extremely data-intensive procedures (see Kee et al., 2009; Niu et al., 2018) to calculate the *ad-valorem* equivalent of non-tariff measures, i.e., the correspondent tariff level that would have the same impact on trade.

### 3.2. Empirical strategy

#### 3.2.1. Partial equilibrium

As described in Head and Mayer (2014) or Yotov et al. (2016), a theory-consistent empirical specification of the structural gravity model may take the following form:

$$X_{ijt} = \exp\left(\delta_{it} + \gamma_{jt} + \rho_{ijt}\right) + \varepsilon_{ijt} \tag{5}$$

On the left hand side of the equation, as described in Section 3.1 above, the term $X_{ijt}$ corresponds to bilateral trade flows between the exporter $i$ and the importer $j$ at time t, including domestic trade flows ($i = j$), in line with Yotov (2012), Dai et al. (2014), Yotov et al. (2016) and Larch et al. (2018). The right hand side of the equation instead, $\delta_{it}$ and $\gamma_{jt}$ are exporter-time and importer-time fixed effects. As indicated by Anderson and van Wincoop (2003), they are the theory-consistent way to account for the MTRs. As mentioned above, the MTRs reflect the fact that trade between two countries ($i$ and $j$) does not depend only on their bilateral trade costs, but also on the trade costs these countries face with the rest of the world.[15] Additionally, $\delta_{it}$ and $\gamma_{jt}$ absorb all country-time varying features, including indicators of economic mass (e.g. GDP). The term $\rho_{ijt}$ reflects bilateral trade costs. Finally, $\varepsilon_{ijt}$ is the error term.

The term $\rho_{ijt}$ can be further separated in two different components:

$$\rho_{ijt} = \omega_{ij} + \eta_{ijt} \tag{6}$$

where $\omega_{ij}$ represents directional[16] pair fixed effects. These serve two purposes[17]: first, they capture time-invariant asymmetric trade costs (Waugh, 2010); second, following Baier and Bergstrand (2007), they represent the standard way of dealing with endogeneity.[18] The other term, $\eta_{ijt}$, provides time variation to $\rho_{ijt}$, and includes a set of variables related to time-varying bilateral trade costs. In our case, the term $\eta_{ijt}$ can be further disentangled as follows:

$$\eta_{ijt} = \beta' TA + \theta' Z \tag{7}$$

where the vector $TA$ collects all the existing trade agreements, grouped in four main categories. As our approach relies on estimating the impact of existing trade agreements on trade (that is, ex post estimations) to infer the trade impacts of the EU-Mercosur agreement *ex-ante*, these categories aims to facilitate the identification of a reduction in bilateral trade costs similar to the one that will be generated by the EU-Mercosur agreement. Indeed, we follow the extant literature in allowing certain heterogeneity across agreements (Baier et al., 2019a, 2019b),[19] associated to: 1) the "depth" of the trade agreement, i.e., with the provisions included in the agreement (Mattoo et al., 2017; Kohl, 2014; Kohl et al., 2016; El Dahrawi Sánchez-Albornoz and Timini, 2021), and 2) the direction of trade (i.e. advanced vs. emerging/developing exporters, see Melitz, 2003; World Bank, 2019; Timini et al., 2020).[20]

Therefore, we exploit these findings to create a group of agreements "similar" to the EU-Mercosur agreement. Again, the "similarity" is assessed based on the chapters/provisions contained in the treaties in our sample and those contained in the EU-Mercosur agreement, and on the direction of trade. By doing so we can go beyond the "average trade agreement effect" (that is, the average effect of all trade agreements in our sample).

Therefore, we set $TA = (TA^{X_{NS}}, TA^{X_{SN}}, TA^{X_{rest}}, TA^{ALL-X})$. As a consequence, in our estimating equation, first, $TA_{ijt}^{X\_NS}$ corresponds to a dummy equal to 1 if country $i$ and $j$ have a trade agreement at time $t$ with the main provisions contained in the EU-Mercosur agreement (see below for more details), and if the trade flow identified is North-to-South, that is, exports from advanced to emerging/developing economies. The dummy is zero otherwise. Second, $TA_{ijt}^{X\_SN}$ corresponds to a dummy equal to 1 if country $i$ and $j$ have a trade agreement at time $t$ with the same conditions listed above, and if the trade flow identified is South-to-North, i.e. exports from emerging/developing to advanced economies. The dummy is zero otherwise. Third, $TA_{ijt}^{X\_rest}$ corresponds to a dummy equal to 1 if country $i$ and $j$ have a trade agreement at time $t$ with the same conditions listed above, but has not been identified in the two previous categories, i.e. the trade flow is "North-to-North" or "South-to-South". The sum of these three dummies identify all trade agreements including the main provisions foreseen in the EU-Mercosur agreement.

[15] For more details on the MTRs and their role in obtaining an unbiased estimation, see Anderson and van Wincoop (2003).

[16] Directional means that we allow $\omega_{ij} \neq \omega_{ji}$ rather than imposing $\omega_{ij} = \omega_{ji}$. This is particularly important as our two variables of interest ($TA_{ijt}^{X\_NS}$ and $TA_{ijt}^{X\_SN}$, see below for more details) are directional.

[17] Pair fixed effects also absorb all the variables that have pair variation (e.g. distance, contiguity, common language, colonial relationship, etc.), and that, traditionally, have been used as proxy for bilateral trade costs in standard gravity models.

[18] Endogeneity concerns derive from the fact that countries may be more likely to sign a trade treaty with their main trading partners.

[19] The heterogeneous effects of trade agreements on trade flows have been confirmed also for those agreements involving Latin American countries (El Dahrawi Sánchez-Albornoz and Timini, 2021).

[20] This means that we allow trade agreement effects to be different between exports from advanced to emerging/developing countries, and exports from emerging/developing to advanced countries. In line with the literature (Melitz, 2003; Aleksynska and Havrylchyk, 2013; Disdier et al., 2015), we will use interchangeably the terms "emerging and developing economies" and "the South", as well as "advanced economies" and "the North". Again in line with the literature, we include in the "North" those economies that are classified as high-income OECD countries, while we classify in the "South" category all other countries.

This means that our identification strategy – like in Dhingra et al. (2018), but further exploiting the detailed information available on the specific provisions included in the agreement[21] – relies on the assumption that trade agreements with similar set of provisions have similar (directional) trade effects. More in detail, we build the "EU-Mercosur like" set of agreements by focusing on the "core" measures – i.e. those indicated, both in the database we use and by the literature, as the most relevant for promoting bilateral trade (Dhingra et al., 2021) – included in the agreement. These are listed in Hofmann et al. (2017) and summarized in Mattoo et al. (2020).[22] These measures include: tariffs, sanitary and phytosanitary measures (SPS), and technical barriers to trade (TBT) (Fontagné et al., 2015; Murina and Nicita, 2017; Timini and Conesa, 2019), trade in services (Blyde and Sinyavskaya, 2007); state-owned enterprises (Kowalski et al., 2013); public procurement (Kim, 2010); intellectual property rights (Maskus and Ridley, 2016); competition policy (Motta and Onida, 1997; Liu and Ye, 2019); investment, including movement of capital (Busse, 2010). For the same reason, and following recent contributions (Brandi et al., 2020; Timini et al., 2020), we also take into account provisions related to the environment and labour markets. In other words, to enter the "EU-Mercosur like" group of agreements, a trade agreement must contain all the provisions listed above. To have a sufficiently large number of trade agreements included in our "EU-Mercosur like" group, we remain agnostic on the provisions not included in the EU-Mercosur "agreement in principle", on the provisions contained in the agreements included in the "EU-Mercosur like" group other than those contained in the EU-Mercosur "agreement in principle", and on the enforceability of the provisions. Table B1 in Appendix B reports the complete list of provisions on which we impose a restriction, and those where we remain agnostic.[23] Importantly, the "EU-Mercosur like" group (identified as described above) include a number of previous EU treaties with other Latin American countries (Colombia, Peru; El Salvador, Guatemala, Honduras, Nicaragua, and Panama).[24]

Furthermore, $TA_{ijt}^{ALL-X}$ also corresponds to a dummy and identifies all other trade agreements in the sample.

The vector $Z$ contains a set of additional time-varying control variables. Depending on the specification, these may include WTO membership, MFN tariff, time-varying distance and international borders.

Finally, to properly address the "zeros of trade" and heteroscedasticity, two distinctive features of trade data, we use the methodology proposed by Santos Silva and Tenreyro (2006), i.e., a Poisson pseudo-maximum likelihood (PPML) estimating procedure. We use three-way clustering techniques (Egger and Tarlea, 2015).

#### 3.2.2. General equilibrium

As explained in Section 3.1, it is possible to obtain general equilibrium effects for certain variables of interest (e.g., exports, imports, welfare), by calculating the difference between its value in a "baseline" scenario and its value in a "counterfactual" scenario. Therefore, in our case, the results of the model should be interpreted as differences with respect to the scenario with no trade agreement.

In our specification, the baseline scenario corresponds to the state of trade costs in 2015, the last year in our database. The counterfactual scenario includes changes in the bilateral trade costs for the EU-Mercosur country pairs, inserted as a "shock" to these bilateral trade relations. The size of the shock, i.e., the reduction in bilateral trade costs of the "EU-Mercosur like" agreements, is dictated by the estimates of $TA_{ijt}^{X\_NS}$ and $TA_{ijt}^{X\_SN}$ coefficients. In our reference scenario, we set the trade elasticity to 4, in line with Simonovska and Waugh (2014) estimations, and close to the median value identified in a recent meta-analysis (Bajzik et al., 2020).

## 4. Data

Export data are from the World Trade Flows (WTF) database (Feenstra and Romalis, 2014).[25] The WTF database includes information on total bilateral trade (exports) between dyads (country-pairs). Total trade comprises trade in goods for agriculture, mining and manufacturing. This feature is especially important for Latin American countries, as a non-negligible share of their exports (in certain cases as large as 70%) is composed by the two former categories. Information on domestic trade flows is not directly available. As in Yotov (2012), we calculate domestic trade flows as the difference between GDP (available from the World Bank World Development Indicators database) and total national exports (from IMF DOTS). While Head and Mayer (2014) thoroughly describe the theoretical reasons why it would be preferable to use gross production rather than GDP data, Campos et al. (2021) show that empirical estimations of trade policy effects on trade and welfare are very robust to how domestic trade is calculated. Our choice of using GDP-based estimates of domestic trade allows maximizing the number of Latin American countries in the sample and expanding the sample until very recent years. In this way we are able to include a variety of "deep" agreements between advanced and emerging/developing economies (therefore increasing the number of "EU-Mercosur like" type of agreements). Data on trade agreements and their characteristics are from the World Bank Horizontal Depth Database (Hofmann et al., 2017, 2019), which contains detailed information on the trade agreements in force. Finally, bilateral distance and WTO membership information are from CEPII, and tariff data from the World Bank World

[21] Differently from us, Dhingra et al. (2018) group the provisions in four big groups. "services&investment&competition", "public procurement", "intellectual property protection" and "standards" and do not consider the rest. Here we adopt a much more disaggregated approach, to precisely identify the "EU-Mercosur like" provisions.

[22] For more details, see Figure O.12 in Mattoo et al. (2020).

[23] Most provisions on which we remain agnostic are "soft" provisions concerning exchange of information, collaboration, or promotion of joint projects.

[24] See Table B2 in Appendix B for a complete list of the agreements included.

[25] Feenstra and Romalis (2014) constructed the WTF database using UN COMTRADE data. By employing mirroring techniques (i.e., comparing statistics of country $i$ imports from country $j$ and country $j$ exports to country $i$), they excluded those observations where importer and exporter declarations where outside the thresholds of "plausibility" (i.e. the ratio between the two being either $<0.1$ or $>10$).

**Table 2**
Partial equilibrium estimates ("trade shocks").

| VARIABLES | (1) w/o globalization | (2) EU-LATAM agreements | (6) Four-year intervals | (4) Separate EU effect | (5) WTO | (6) MFN | (7) Disentangling Globalization |
|---|---|---|---|---|---|---|---|
| $TA^{X\_NS}_{ijt}$ | 0.481*** | | 0.449*** | | 0.470*** | 0.371*** | 0.249** |
| | (0.105) | | (0.0746) | | (0.107) | (0.0983) | (0.109) |
| $TA^{X\_SN}_{ijt}$ | 0.656*** | | 0.599*** | | 0.633*** | 0.417*** | 0.387*** |
| | (0.152) | | (0.114) | | (0.147) | (0.139) | (0.136) |
| $TA^{X\_REST}_{ijt}$ | 0.428*** | | 0.423*** | | 0.425*** | 0.293*** | 0.0871 |
| | (0.0888) | | (0.0695) | | (0.0895) | (0.0894) | (0.0940) |
| $TA^{ALL-X}_{ijt}$ | 0.374*** | | 0.453*** | | 0.367*** | 0.288*** | 0.207*** |
| | (0.0680) | | (0.0624) | | (0.0691) | (0.0805) | (0.0728) |
| $WTO_{ijt}$ | | | | | 1.114*** | | |
| | | | | | (0.295) | | |
| $\ln(1+MFN)_{ijt}$ | | | | | | −7.904*** | |
| | | | | | | (1.167) | |
| $TA\_noEU^{X\_NS}_{ijt}$ | | | | 0.561*** | | | |
| | | | | (0.116) | | | |
| $TA\_noEU^{X\_SN}_{ijt}$ | | | | 0.682*** | | | |
| | | | | (0.201) | | | |
| $TA\_noEU^{X\_REST}_{ijt}$ | | | | 0.287*** | | | |
| | | | | (0.0602) | | | |
| $TA\_noEU^{ALL-X}_{ijt}$ | | | | 0.313*** | | | |
| | | | | (0.0569) | | | |
| $EU_{ijt}$ | | | | 0.617*** | | | |
| | | | | (0.0992) | | | |
| $EU\_LA_{ijt}$ | | 0.416*** | | | | | |
| | | (0.103) | | | | | |
| $LA\_EU_{ijt}$ | | 0.304*** | | | | | |
| | | (0.0707) | | | | | |
| $TA^{ALL-(EU\_LA\ +\ LA\_EU)}_{ijt}$ | | 0.442*** | | | | | |
| | | (0.0645) | | | | | |
| Observations | 88,122 | 88,122 | 22,160 | 88,122 | 88,122 | 65,435 | 88,122 |
| Directional pair FEs | YES | YES | YES | YES | YES | YES | YES |
| Exp.-time & imp.time FEs | YES | YES | YES | YES | YES | YES | YES |
| INTL_BRDR*YEAR | NO | NO | NO | NO | NO | NO | YES |
| DIST*YEAR | NO | NO | NO | NO | NO | NO | YES |

Note: Poisson regressions. Dependent variable: Bilateral exports. Fixed effects, constant, trends and other interactions not reported for the sake of simplicity. Standard errors (in parentheses) are clustered at the importer-time, exporter-time and country-pair level. ***p < 0.01, **p < 0.05, *p < 0.1.

Development Indicators database. Our sample includes 53 countries, corresponding to almost 90% of global GDP (see Table B3 in Appendix B for a complete list of the countries included). The period covered by the sample is 1984–2015.

## 5. Results

In this section: first, we present the partial equilibrium results estimating the trade effects of existing trade agreements similar to the EU-Mercosur. These are important because they constitute the magnitude of the "trade shock"[26] – that is, the reduction in bilateral trade costs dictated by the "EU-Mercosur" agreement – inserted in the general equilibrium model. Indeed, they are one of the two key parameters of the model (the other being the trade elasticity parameter). Second, we report the general equilibrium structural gravity model results for the EU-Mercosur impact on exports, imports and welfare for all the 54 countries that are included in our sample.

### 5.1. Partial equilibrium results

Table 2 reports the estimates of the partial equilibrium effects of trade agreements on trade flows (exports). The main coefficients of

[26] To ensure that the effect is truly exogenous, in our main regression we follow the Baier and Bergstrand (2007) approach to control for endogeneity (pair fixed effects). Additionally, we also implement a "strict exogeneity test" (as in, e.g., Baier and Bergstrand, 2007; Kohl, 2014; and Yotov et al., 2016) by including the lead of the dummies indicating the presence of a (certain type of) trade agreement. In the absence of reverse causality, the lead should not be statistically different from zero. As in Yotov et al. (2016), we use four-year intervals to avoid capturing anticipation effects. The coefficients of the leads of our variable of interests ($TA^{X\_NS}$ and $TA^{X\_SN}$) pass the strict exogeneity test. Additionally, we also perform the same exogeneity test using two-year and one-year intervals. Most results hold. The coefficients however are slightly larger in size and for the $TA^{X\_SN}$ lead marginally significant when using two-year intervals. These results may be driven by anticipation effects (trade increases before the agreement becomes active as exporters and importers are internalizing its future effects). Results are available upon request.

interest are those of the dummy variables $TA_{ijt}^{X\_NS}$ and $TA_{ijt}^{X\_SN}$. Indeed, we want to understand the partial effects of existing agreements with provisions similar to the "EU-Mercosur", involving advanced ("North") and emerging/developing ("South") economies. So, the $TA_{ijt}^{X\_NS}$ coefficient corresponds to the partial equilibrium effect of the average "EU-Mercosur like" trade agreement on "North" exports to the "South", i.e. the reduction in bilateral costs we will impute to EU exports to Mercosur. The $TA_{ijt}^{X\_SN}$ coefficient instead indicates the partial equilibrium effect of the average "EU-Mercosur like" trade agreement on "South" exports to the "North", which is the reduction in bilateral costs we will impute to Mercosur exports to the EU.

As our identification strategy relies on two main assumptions – first, agreements with similar provisions generate similar trade effects and, second, $TA_{ijt}^{X\_NS}$ and $TA_{ijt}^{X\_SN}$ coefficients are not capturing trade effects other than those created by the identified trade agreements – in Table 2 we run different specifications testing the sensitiveness of the partial equilibrium results to changes in these assumptions.

In our first regression (see Column 1, Table 2), we do not include any controls for other changes in the openness of countries, i.e. globalization effects, that therefore may be captured by the trade agreement dummies, likely introducing an upward bias in their estimation. We consider these results as a sort of "upper bound estimates" within our methodological framework. In this case, "EU-Mercosur like" agreements lead to approximately a 60% (i.e. $100*[e^{\beta^{TA^{X\_NS}}}-1]$) increase in North-to-South exports, and to approximately a 90% (i.e. $100*[e^{\beta^{TA^{X\_SN}}}-1]$) increase in South-to-North exports.

In our second regression (see Column 2, Table 2), we relax our first assumption, i.e., agreements with similar provisions generate similar trade effects, and adopt a strictly geographical approach instead. Indeed, Baier et al. (2018) and Freeman and Pienknagura (2019) argue that distance may be an important mediating factor, partly explaining the heterogeneous trade effects of trade agreements. Therefore, we group the existing trade agreements between the EU and other Latin American countries and separately estimate their effects on EU exports and Latin American exports. However, the strict geographical approach may introduce a downward bias to our coefficients of interest, for two reasons. First, most of the agreements between the EU and these Latin American countries have been signed close to the end of our sample. However, Bergstrand et al. (2015) indicate that – due to phase-in periods, structural transformation processes, etc. – trade agreements need nearly a decade to achieve their "full potential". Second, some trade agreements between the EU and these Latin American countries are less ambitious (in terms of tariffs and non-tariffs concessions) than the EU-Mercosur "agreement in principle".

In our third regression (see Column 3, Table 2), we use four-year intervals, following Cheng and Wall (2005) argument that "full adjustment" between trade and trade agreements require some time. Our coefficients of interest do not substantially depart from those of the previous regressions.

In our fourth regression (see Column 4, Table 2), we separate the EU from the rest of trade agreements. Indeed, the EU is a profoundly integrated bloc, whose clauses and provisions go well beyond trade issues in many different aspects.[27] In line with what expected, the point estimate of the EU coefficient is very large, but it does not reduce our coefficients of interest.

In the remaining regressions (Columns 5 to 7, Table 2), we focus on disentangling trade effects other than those created by the identified trade agreements. In Column 5, we include a dummy capturing WTO membership. The dummy is equal to 1 if both the exporter and the importer are WTO members. However, due to the characteristics of our database, most of the variation is provided by the WTO accession of China (2001) and Russia (2012). This explains that the dummy coefficient is not fully aligned with the literature, being on the upper side of the distribution.[28] In Column 6, we include the most favored nation (MFN) tariff, using the logarithm of (1+) the simple mean (across all products) of the MFN tariff rate.[29] As described in Heid et al. (2021), the inclusion of non-discriminatory trade policy variables, such as the MFN rate, in a properly specified structural gravity model is made possible by the inclusion of both international and domestic trade flows. By adding domestic trade flows, non-discriminatory trade policy variables are not perfectly collinear with MTRs anymore, as there is more than one value in their vectors of interest. In our case, the MFN vector is equal to $ln(1+MFN)$ if $i \neq j$, but it is equal to zero if $i = j$. As expected, the MFN coefficient is negative and significant, although the coefficient size (that can be interpreted as a trade elasticity) is somewhat more conservative than what suggested in the literature (see Bajzik et al., 2020). In line with what expected, the point estimates of our coefficients of interest are smaller: part of the "TA effect" is captured by changes in the average tariff.[30] However, the inclusion of the MFN variable may introduce a downward bias, as it may capture part of the "true" TA effect.

Finally, in Column 7, we adopt a more conservative approach for estimating the "trade agreement effect" on trade. We follow Bergstrand et al. (2015) in disentangling broader economic integration effects by the inclusion of two interaction terms. First, an interaction between an international border dummy (a dummy equal to 1 if $i \neq j$, i.e. if the flow is international trade, and zero if the flow represents domestic trade) and a time dummy. Second, an interaction between the logarithm of distance and a time dummy. In this way, by allowing the coefficient of the international border and distance to vary over time, we capture a "globalization effect". In this specification, our results suggest that existing agreements similar to the "EU-Mercosur" increase North-to-South exports by approximately 30% (i.e. $100*[e^{\beta^{TA^{X\_NS}}}-1]$), and South-to-North exports by approximately 50% (i.e. $100*[e^{\beta^{TA^{X\_SN}}}-1]$).

Following Bergstrand et al. (2015) suggestions, we adopt the latter, more conservative, approach as our reference regression for the

[27] See, e.g., Pelkmans (2011).

[28] For an in-depth discussion of the "GATT/WTO effect", see Gil-Pareja et al. (2016), Larch et al. (2019), Esteve-Pérez et al. (2020), and Felbermayr et al. (2020).

[29] Results are robust to the use of the weighted average of MFN tariff, or the use of the applied rate.

[30] Tariff data are usually scattered and difficult to obtain. Our sample is not an exception. When we consider tariffs in the regression, we lose approximately one fourth of total observations.

**Table 3**
Effects of the EU-Mercosur agreement, general equilibrium results (disentangling globalization).

| | | Δ%exports | Δ%imports | Δ%welfare |
|---|---|---|---|---|
| MERCOSUR | ARG | 6.79 | 5.88 | 0.15 |
| | BRA | 7.41 | 8.69 | 0.19 |
| | PRY | 5.74 | 4.06 | 0.33 |
| | URY | 7.04 | 5.41 | 0.35 |
| | *MERCOSUR (avg.)* | *7.22* | *7.87* | *0.19* |
| EU | AUT | 0.11 | 0.10 | 0.02 |
| | BEL | 0.11 | 0.11 | 0.09 |
| | CZE | -0.01 | -0.01 | 0.02 |
| | DEU | 0.28 | 0.33 | 0.04 |
| | DNK | 0.29 | 0.29 | 0.03 |
| | ESP | 0.63 | 0.56 | 0.05 |
| | FIN | 0.31 | 0.30 | 0.03 |
| | FRA | 0.31 | 0.25 | 0.02 |
| | GRC | 0.21 | 0.09 | 0.01 |
| | HUN | 0.02 | 0.02 | 0.03 |
| | IRL | 0.11 | 0.21 | 0.02 |
| | ITA | 0.43 | 0.48 | 0.03 |
| | NLD | 0.43 | 0.42 | 0.08 |
| | POL | 0.11 | 0.09 | 0.03 |
| | PRT | 0.56 | 0.46 | 0.06 |
| | SVK | -0.04 | -0.04 | 0.01 |
| | SWE | 0.18 | 0.18 | 0.02 |
| | *EU (avg.)* | *0.31* | *0.31* | *0.04* |
| REST OF LATIN AMERICA | BOL | 0.16 | 0.14 | 0.00 |
| | CHL | -0.05 | -0.06 | -0.01 |
| | COL | -0.05 | -0.04 | 0.00 |
| | CRI | -0.07 | -0.06 | 0.00 |
| | DOM | -0.07 | -0.04 | 0.00 |
| | ECU | -0.06 | -0.06 | 0.00 |
| | GTM | -0.04 | -0.03 | 0.00 |
| | GUY | -0.05 | -0.04 | 0.00 |
| | HND | -0.03 | -0.03 | 0.00 |
| | HTI | -0.03 | -0.01 | 0.00 |
| | JAM | -0.13 | -0.04 | 0.00 |
| | MEX | -0.01 | -0.01 | 0.00 |
| | NIC | -0.03 | -0.03 | 0.00 |
| | PAN | 0.02 | 0.01 | 0.00 |
| | PER | -0.06 | -0.06 | 0.00 |
| | SLV | -0.03 | -0.02 | 0.00 |
| | VEN | -0.12 | -0.15 | 0.00 |
| EU NEIGHBOURS | CHE | -0.04 | -0.05 | 0.00 |
| | GBR | -0.08 | -0.05 | 0.00 |
| | ISL | -0.19 | -0.18 | -0.01 |
| | NOR | -0.10 | -0.13 | -0.01 |
| | RUS | -0.10 | -0.17 | 0.00 |
| | TUR | -0.11 | -0.06 | 0.00 |
| REST OF THE WORLD | AUS | -0.01 | -0.01 | 0.00 |
| | CAN | -0.02 | -0.01 | 0.00 |
| | IND | -0.05 | -0.03 | 0.00 |
| | CHN | -0.05 | -0.08 | 0.00 |
| | JPN | -0.03 | -0.04 | 0.00 |
| | KOR | -0.01 | -0.02 | 0.00 |
| | NZL | -0.03 | -0.02 | 0.00 |
| | USA | -0.02 | -0.02 | 0.00 |
| | ZAF | -0.04 | -0.05 | 0.00 |

Note: Δ%exports, Δ%imports, Δ%welfare refer to percentage change with respect to the baseline (for baseline definition see text). "avg." means average, and is calculated as a GDP PPP weighted average of country-level results.

general equilibrium model.

### 5.2. General equilibrium results

Table 3 summarizes the results of the reference scenario, in terms of changes in total exports, imports, and welfare. Results are

displayed at the country-level, but we also report aggregate results for the EU and the Mercosur.[31] For practical purposes, we listed the countries in the following order: Mercosur members, EU members, Rest of Latin America, EU Neighbours, and Rest of the World, to help visualizing the trade effects on the members of the two blocs', and whether their closest neighbours suffer from any sizeable trade diversion effect.

There are several features of the general equilibrium results that we would like to emphasize. First, both Mercosur and EU countries show increases in both total exports and imports. Nevertheless, they differ substantially in size. As these are *total* trade flows, the difference is likely due to the relevance of bilateral trade shares (between Mercosur and the EU) – quite pronounced in the case of Mercosur countries, much more limited for EU economies. In 2015, our baseline year, the EU accounted for more than one-sixth of Mercosur's total trade in goods. Oppositely, the Mercosur accounted for approximately 1% of EU's total trade in goods. In our reference scenario, we estimate Mercosur exports to increase by 7% on average (between 5% and 7% depending on the country), Mercosur imports by 8% (between 4% and 9%, depending on the country). For the EU, as noted above, these effects are much smaller: between 0 and 0.6%. Second, welfare effects are particularly large for Mercosur countries (in line with larger trade effects), ranging between 0.2 and 0.4%. These numbers are significant in economic terms. For the EU the effects are relatively modest, albeit with significant heterogeneity across member states. They range between practically 0 and 0.1%, highlighting that for some EU countries the agreement may generate some economically significant effects.[32] In particular, EU countries experimenting the highest benefits from the agreement are those that either had stronger previous trade linkages with Mercosur (like Spain and Portugal, whose trade in goods with the Latin American bloc in 2015 accounted for about 1.7% of total goods trade) or small open economies for which trade increases translate into higher welfare effects (like Belgium and the Netherlands). Indeed, the model shows larger trade-to-welfare transmissions for small (open) economies, since the relevance of the external demand is relatively higher than for those economies having a larger internal market.

Fourth, trade diversion effects are practically inexistent. Indeed, for most countries, even the closest Mercosur and EU neighbours, trade effects are close to zero, and welfare effects are null. In the case of Bolivia, we see a small positive effect on trade. This is due to the first and second round feedback effects from changes in MTRs and changes in GDP, particularly for Mercosur countries. In other words, the positive effects on the GDP of Mercosur countries translate in a larger market for Bolivian exports, counteracting the negative effects deriving from more competition from Europe Additionally, those European neighbours that form part of the EFTA (European Free Trade Area) –Iceland, Liechtenstein, Switzerland and Norway – are also expected to implement a free trade agreement with Mercosur. The effects of that agreement, whose preliminary negotiations reached a "conclusion in substance" in August 2019, are very likely to substantially overweight the small negative trade diversion effects reported in Table 3.[33]

Finally, a note on the trade elasticity parameter. As noted in Arkolakis et al. (2012), this parameter is inversely related to the transformation of trade-to-welfare effects. As described in the empirical strategy section, we use a trade elasticity of 4. This number has been estimated by Simonovska and Waugh (2014), and it is very close to the median value identified by Bajzik et al. (2020) in a recent meta-analysis. Bajzik et al. (2020) suggest that the elasticity likely ranges between 2.5 and 5.1: the higher the value of the parameter used, the lower the changes in welfare corresponding to the same change in trade. To check the sensitiveness of our results to changes in the trade elasticity parameter, we run three additional counterfactuals. We use trade elasticity values corresponding to 2.5, 5.1, and 7.9, instead of a value of 4 like in our reference scenario. These numbers correspond, respectively, to Bajzik et al. (2020) lower and upper bound estimates, and our own, more conservative, estimate of the trade elasticity parameter. Average welfare effects for Mercosur are equal to 0.29, 0.15, and 0.10 respectively (instead of 0.19, obtained in our reference scenario). Average welfare effects for the EU are equal to 0.06, 0.02, and 0.01 respectively (instead of 0.04, obtained in our reference scenario).[34]

To conclude, there are some caveats we would like to stress while interpreting all the preceding estimations: first, due to relevant gaps in the data, we do not include service flows, which are an important component of bilateral exchanges and are object, in the treaty, of several liberalizing provisions. Additionally, the model is not dynamic: it does not include features related to asset accumulation. In this sense, the results are therefore likely to represent lower bound estimates. Second, we carry out our empirical study using data on aggregate bilateral flows and a general equilibrium model with one sector and one factor of production. Therefore, in this model we are not able to take into account that tariff reductions could differ across sectors, and could have heterogeneous effects at the sector, firm and household levels (Grossman and Helpman, 2018; Artuc et al., 2019). This also means that we are not able to identify the eventual "winners and losers" of the EU-Mercosur agreement. Finally, our empirical instruments do not take into account other broader considerations, such as the environmental consequences of the agreement – issues that remain outside the scope of our paper.

[31] Aggregate results are GDP-weighted averages. We use PPP GDP data for the year 2015 as weights.

[32] We also report a summary of the EU-Mercosur agreement general equilibrium effects using alternative partial equilibrium estimates in Table B4. Detailed country-level results are available upon request.

[33] The "conclusion in substance" summarizes the main characteristics of the future agreement and is available at https://www.efta.int/sites/default/files/documents/legal-texts/free-trade-relations/mercosur/2019-08-24-EFTA-Mercosur-Chapter-Description-of-FTA.pdf.

[34] As it can be seen from equations (1)–(4), changes in sigma do not only affect the transformation of trade-to-welfare effects (Equation (4)), but also the mapping of estimated trade effects into changes in bilateral trade costs (i.e. changes in $\tau_{ijt}$ – Equations (1)–(3)). In other words, changes in sigma affect both trade and welfare effects. However, in our case, changes in the trade effects are very limited (in the range of $\pm$ 2% with respect to the value of the baseline scenario reported in Table 3). Detailed country-level results are available upon request.

## 6. Conclusions

In this paper we use a general equilibrium structural gravity model to analyze the EU-Mercosur agreement and predict its effects on trade and welfare. More in detail, we apply a Poisson pseudo-maximum likelihood estimation strategy (Santos-Silva and Tenreyro, 2006) and, in line with the latest development of the literature (e.g. Yotov et al., 2016), account for domestic trade flows. As a first step, we exploit the detailed provision-level information available for the EU-Mercosur agreement to identify partial equilibrium trade effects of existing treaties with similar set of provisions. As a second step, we reduce the bilateral trade costs of the EU-Mercosur country pairs by the amount estimated in our partial equilibrium model to calculate the general equilibrium effects of the agreement.

Our results show that the potential trade and welfare enhancing effects of the EU-Mercosur agreement are substantial, and that their distribution is considerably heterogeneous. Mercosur countries are set to experience the largest gains from trade: in our reference scenario exports increase by 7%, imports by 8%, and welfare by 0.2%, on average. The trade and welfare gains for EU countries are considerably smaller: exports and imports increase by 0.3%, and welfare gains are lower than 0.1%, on average. These substantial differences arise from the different relevance of bilateral trade shares (between Mercosur and the EU) – quite pronounced in the case of Mercosur countries, much more limited for EU economies. The model also shows larger trade-to-welfare transmissions for small (open) economies, since the relevance of the external demand for their growth is relatively higher that for those economies having a larger internal market. Trade diversion effects (i.e., on third-countries trade) are practically inexistent.

While our approach is able to take into account "within"-bloc heterogeneity, i.e., it provides detailed insights on trade and welfare effects at the country level, it does not investigate the existence of within-country heterogeneity. Indeed, the effects of the EU-Mercosur agreement may be unevenly distributed across sectors, firms and households, as argued by various authors (see Milanovic and Squire, 2007; Autor et al., 2013; Artuc and McLaren, 2015; Artuc et al., 2019), and may affect both economic growth and wage inequality (Manasse and Turrini, 2001; Grossman and Helpman, 2018). These issues, together with other broader considerations (including, for example, the environmental consequences of the agreement or the role of trade in services), deserve further research and attention.

## Appendix A

Structural gravity models include bilateral trade flows ($X_{ij}$) from country $i$ (the exporter) to country $j$ (the importer). Trade flows cannot be negative. Then:

$$X_{ij} = \frac{Y_i E_j}{Y}\left(\frac{\tau_{ij}}{P_i \Omega_j}\right)^{1-\sigma} \geq 0 \tag{A.1}$$

In equation (A.1), bilateral trade flows $X_{ij}$ correspond to international trade flows for $i \neq j$, and to domestic trade flows for $i = j$. The term $Y_i$ represents exporter's production (i.e. country $i$ production), and it is defined as $Y_i \overset{def}{=} \sum_j X_{ij}$. The term $E_j$ represents importer's expenditure (i.e. country $j$ expenditure) – defined as $E_j \overset{def}{=} \sum_i X_{ij}$. The term $Y$ represents world output, defined as $Y \underline{\underline{def}} \sum_i Y_i$. The term $\tau_{ij}$ identifies bilateral trade costs, including (bilateral) trade agreements. Equation (A.1) is usually defined as "partial equilibrium" (e.g. Head and Mayer, 2014; Yotov et al., 2016).

Structural gravity models include other two conditions:

$$P_i^{1-\sigma} = \sum_j \left(\frac{\tau_{ij}}{\Omega_j}\right)^{1-\sigma} \frac{E_j}{Y} \tag{A.2}$$

$$\Omega_j^{1-\sigma} = \sum_i \left(\frac{\tau_{ij}}{P_i}\right)^{1-\sigma} \frac{Y_i}{Y} \tag{A.3}$$

The terms $P_i$ and $\Omega_j$ are called "multilateral resistances" (respectively outward multilateral resistance and inward multilateral resistance). These terms are specific to the exporter (country $i$) and the importer (country $j$) respectively. These terms are measures of aggregate (i.e. country-level) trade costs. The system of equations (A.1)-(A.3) are usually defined as "modular" (Head and Mayer, 2014) or "conditional general equilibrium" (Yotov et al., 2016).

To obtain what is usually defined as "general equilibrium" (Head and Mayer, 2014) or "full endowment general equilibrium" (Yotov et al., 2016), it is necessary to impose a market clearing condition to the system of equations (A.1)-(A.3). Market clearing means that the supply of the goods traded in the market are equal to the demand for those goods. Formally, this means:

$$Y_i = \sum_j X_{ij} = \sum_j \left(\frac{\alpha_i p_i \tau_{ij}}{\Omega_j}\right)^{(1-\sigma)} E_j = (\alpha_i p_i)^{(1-\sigma)} \sum_j \left(\frac{\tau_{ij}}{\Omega_j}\right)^{(1-\sigma)} E_j \tag{A.4}$$

The second equality exploits constant elasticity of substitution (CES) utility functions – an assumption common to most structural gravity models, including, e.g., Anderson and van Wincoop (2003). In this context, $p_i$ is the (factory-gate) price for exporter $i$ products ($p_i \tau_{ij}$ corresponds to price at destination), and $\alpha_i$ is the CES preference parameter. The latter displays the usual taste for variety in gravity models, where goods are differentiated by place of origin.

Dividing both sides of the equation for the world output, it is possible to reformulate Equation (A.4) as follows:

$$(\alpha_i p_i)^{(1-\sigma)} = \frac{\frac{Y_i}{Y}}{\sum_j \left(\frac{\tau_{ij}}{\Omega_j}\right)^{(1-\sigma)} \frac{E_j}{Y}} \tag{A.5}$$

Noting that the denominator of the fraction in the right-hand side of the equation corresponds to the outward multilateral resistance as defined above, and solving for $p_i$:

$$p_i = \left(\frac{Y_i}{Y}\right)^{1/(1-\sigma)} \frac{1}{\alpha_i P_i} \tag{A.6}$$

Finally, it is only sufficient to recall the relation between aggregate expenditure ($E_i$) and nominal production ($Y_i$). If trade is balanced, then expenditure is exactly equal to production, i.e. $E_i = Y_i$ . However, in most cases, this is not something that occurs in the data. To account for trade imbalances then, it is possible to rewrite the relationship as follows:

$$E_i = \xi_i Y_i = \xi_i p_i Q_i \tag{A.7}$$

Where $\xi_i$ is an exogenous parameter, whose value determines whether exporter i faces trade surplus ($0 < \xi_i < 1$) or a trade deficit ($\xi_i > 1$). In the particular case of $\xi_i = 1$ trade is perfectly balanced. The second equality is easily derived, as nominal production $Y_i$ can be rewritten as the result of the interaction of the quantity produced ($Q_i$) and its price (proxied by the factory-gate price: $p_i$). in In this framework, $Q_i$ is assumed to be constant, and therefore nominal production and expenditure change as a consequence of changes in prices $p_i$.

This model falls within the Arkolakis et al. (2012) wide set of trade models for which welfare changes from trade can be reformulated as a combination of two "sufficient statistics". Recalling that for any variable $x$, its change can be formulated $\widehat{x} = \frac{x'}{x}$ (where $x$ is the value in the baseline scenario, and $x'$ the value in the counterfactual scenario):

$$\frac{W'}{W} = \widehat{W} = \left(\frac{\lambda'_{ii}}{\lambda_{ii}}\right)^{1/(1-\sigma)} = \widehat{\lambda}_{ii}^{1/(1-\sigma)} \tag{A.8}$$

In Equation (A.8) both terms are constructed as a combination of terms previously included in the model, and therefore can be easily obtained. Welfare is defined as $W_i = \frac{E_i}{\Omega_i}$ , and the domestic trade share $\lambda_{ii} = \frac{X_{ii}}{E_i}$.

In our case, the changes introduced in the counterfactual scenario (with respect to the baseline) concern $\tau_{ij}$ (bilateral trade costs). This means that bilateral trade costs in the baseline ($\tau_{ij}$) will not be identical to bilateral trade costs in the counterfactual scenario ($\tau'_{ij}$).

Given our empirical specification (Section 3.2), bilateral trade costs in the baseline are calculated as follows:

$$\tau_{ij}^{1-\sigma} = \exp(\rho_{ij}) = \exp(\omega_{ij} + \eta_{ij}) \tag{A.9}$$

where $\omega_{ij}$ are directional pair fixed effects, and $\eta_{ij}$ includes $\beta' TA$, a vector collecting all the existing trade agreements, grouped in different categories: $TA = (TA^{X_{NS}}, TA^{X_{SN}}, TA^{X_{rest}}, TA^{ALL-X})$. Of particular interest for the purposes of this Appendix are $TA^{X_{NS}}$ and $TA^{X_{SN}}$ (definitions of the other variables are available in Section 3.2). The former is a dummy equal to 1 if country i and j have a trade agreement with the main provisions contained in the EU-Mercosur, and if the trade flow identified is North-to-South, that is, exports from advanced to emerging/developing economies. The dummy is zero otherwise. The latter is a dummy equal to 1 if country $i$ and $j$ have a trade agreement at time $t$ with the same conditions listed above, and if the trade flow identified is South-to-North, i.e. exports from emerging/developing to advanced economies. The dummy is zero otherwise.

In our counterfactual scenario, we redefine $TA^{X_{NS}}$ and $TA^{X_{SN}}$, by replacing zeros with ones in the EU-Mercosur (e.g. France exports to Brazil) and Mercosur-EU (e.g. Brazil exports to France) country pairs respectively.

Therefore, the change in bilateral trade cost is imposed exogenously, and bilateral trade costs in the counterfactual scenarios can be obtained as follows:

$$\tau'^{1-\sigma}_{ij} = \exp(\rho_{ij}) = \exp(\omega_{ij} + \eta'_{ij}) \tag{A.10}$$

As explained above, the model can be solved for baseline and counterfactual scenario values, and differences between the two in the indices of interest (e.g. trade and welfare) can be computed accordingly.

## Appendix B

**Table B.1**
Provisions considered in building the "EU-Mercosur like" group of agreements

| Provisions | Horizontal DB code | Short description | |
|---|---|---|---|
| Tariffs (industrial) | wto_plus_ftaindustrial | "FTA Industrial" (tariff liberalization in industrial goods) | ✓ |
| Tariffs (agriculture) | wto_plus_ftaagriculture | "FTA Agriculture" (tariff liberalization in agricultural goods) | ✓ |
| Customs | wto_plus_customs | "Customs" (provisions on information and trade facilitation) | ✓ |

(*continued on next page*)

**Table B.1** (*continued*)

| Provisions | Horizontal DB code | Short description | |
|---|---|---|---|
| Export Taxes | wto_plus_exporttaxes | "Export Taxes" (elimination or reduction of export duties and other taxes) | ✓ |
| SPS | wto_plus_sps | "SPS" (provisions referring to the World Trade Organization [WTO] Agreement on Sanitary and Phytosanitary Standards; measures for harmonization) | ✓ |
| TBT | wto_plus_tbt | "TBT" (provisions referring to the WTO Agreement on Technical Barriers to Trade; measures for harmonization or mutual recognition) | ✓ |
| Rules on SOEs | wto_plus_ste | "STE" (rules on state enterprises, GATT Art. XVII) | ✓ |
| Public Procurement | wto_plus_publicprocurement | Public Procurement" (progressive liberalization, national treatment/non-discrimination, etc.) | ✓ |
| Trade in Services | wto_plus_gats | "GATS" (liberalization of trade in services) | ✓ |
| IPRs | wto_plus_trips | "TRIPs" (WTO rules on intellectual property rights) | ✓ |
| | wto_x_ipr | "IPR" (reference to extra-WTO international treaties on intellectual property rights) | |
| Competition policy | wto_x_competitionpolicy | "Competition Policy" (chapter on competition policy) | ✓ |
| Investment | wto_x_investment | "Investment" (rules on foreign investment, including simplification, harmonization and national treatment, as well as mechanisms for the settlement of disputes) | ✓ |
| Labor | wto_x_labourmarketregulation | "Labor Market Regulation" (labor provisions, including ILO standards, other regulations concerning national labor markets, as well as enforcement mechanisms) | ✓ |
| Environment | wto_x_environmentallaws | "Environmental Laws" (environmental provisions including environmental standards and enforcement mechanisms) | ✓ |
| Movement of capital | wto_x_movementofcapital | "Movement of Capital" (liberalization of capital movements and/or prohibition of new restrictions) | ✓ |
| Antidumping, Countervailing measures, State Aid | wto_plus_ad<br>wto_plus_cvm<br>wto_plus_stateaid | "AD" (antidumping), "CVM" (countervailing measures) and "State Aid" (assessment of behaviours that are not in line with competition policy) | **(✓)** |
| Other (non-core) provisions* | | | **not restricted** |

Source: Authors' elaboration on Horizontal Depth DB.

Note: ✓implies that the corresponding dummy is set to be equal to one. (✓) implies that while we do not formally impose any restriction, more than 99.6% of observations used for recreating the EU-Mercosur agreement pertain to agreements that include all these provisions. "not restricted" implies that we do not set any restrictions to the corresponding dummies.

*We do not set any restrictions on a large number of categories, however these are classified as "non-core" provisions in the database, i.e. not very relevant for promoting trade. Indeed, most of these are "soft" provisions, have little relation with the economy and trade, cover narrow topics, and are mostly related to exchange of information, collaboration, promotion of joint projects, and other similar issues. A complete list of ("core" and "non-core") provisions is available in Hofmann et al. (2017). A summary is also available in Mattoo et al. (2020).

**Table B.2**
Trade agreements

| Agreement | Year (entry into force) | "EU-Mercosur like" agreements |
|---|---|---|
| Australia-New Zealand (ANZCERTA) | **1983** | |
| CAFTA-DR | **2006** | |
| CAN (Andean Community) | **1988** | |
| Canada – Chile | **1997** | |
| Canada – Colombia | **2011** | |
| Canada – Costa Rica | **2002** | |
| Canada – Honduras | **2014** | |
| Canada – Panama | **2013** | |
| Canada – Korea (Rep. of) | **2015** | **X** |
| Canada – EFTA | **2009** | |
| Canada – Peru | **2009** | |
| CARICOM | **1973** | |
| Central American Common Market (CACM) | **1961** | |
| Chile – Colombia | **2009** | |
| Chile – Costa Rica | **2002** | |
| Chile – El Salvador | **2002** | |
| Chile – Guatemala | **2010** | |
| Chile – Honduras | **2008** | |
| Chile – Mexico | **1999** | |
| Chile – Nicaragua | **2012** | |
| Chile – Australia | **2009** | |
| Chile – China | **2006** | |
| Chile – Japan | **2007** | |

(*continued on next page*)

**Table B.2** (*continued*)

| Agreement | Year (entry into force) | "EU-Mercosur like" agreements |
|---|---|---|
| Chile – Korea | **2004** | |
| China – Costa Rica | **2011** | |
| China – New Zealand | **2008** | |
| China – Peru | **2010** | |
| Colombia – Mexico | **1995** | |
| Colombia – Northern Triangle (El Salvador, Guatemala, Honduras) | **2009** | |
| Costa Rica – Peru | **2013** | |
| Dominican Republic – Central America | **2001** | |
| EEC/EU | **1958–2007*** | **X** |
| EC – Chile | **2003** | |
| EC – Iceland | **1973** | |
| EC – Mexico | **2000** | |
| EC – Norway | **1973** | |
| EC – South Africa | **2000** | |
| EC – Switzerland and Liechtenstein | **1973** | |
| EC – Turkey | **1996** | |
| European Economic Area (EEA) | **1994** | **X** |
| European Free Trade Area (EFTA) | **1960** | |
| EFTA – Central America | **2014** | **X** |
| EFTA – Chile | **2004** | |
| EFTA – Colombia | **2011** | |
| EFTA – Korea (Rep. of) | **2006** | |
| EFTA – Mexico | **2001** | |
| EFTA – Peru | **2011** | |
| EFTA – Southern African Customs Union (SACU) | **2008** | |
| EU – Central America | **2013** | **X** |
| EU – Colombia and Peru | **2013** | **X** |
| EU – Korea (Rep. of) | **2011** | **X** |
| El Salvador – Honduras – Chinese Taipei | **2008** | |
| Iceland – China | **2014** | |
| India – Japan | **2011** | |
| Japan – Australia | **2015** | |
| Japan – Peru | **2012** | |
| Japan – Mexico | **2005** | |
| Japan – Switzerland | **2009** | |
| Korea (Rep. of) – Australia | **2014** | **X** |
| Korea (Rep. of) – Turkey | **2013** | |
| Korea (Rep. of) – US | **2012** | **X** |
| Korea (Rep. of) – India | **2010** | |
| Mercosur | **1991** | |
| Mexico – Central America | **2012** | |
| Mexico – Uruguay | **2004** | |
| NAFTA | **1994** | **X** |
| Panama – Chile | **2008** | |
| Panama – Costa Rica | **2008** | |
| Panama – El Salvador | **2003** | |
| Panama – Guatemala | **2009** | |
| Panama – Honduras | **2009** | |
| Panama – Nicaragua | **2009** | |
| Panama – Peru | **2012** | |
| Peru – Korea (Rep. of) | **2011** | |
| Peru – Mexico | **2012** | |
| Switzerland – China | **2014** | |
| Trans-Pacific Strategic Economic Partnership (TPSEP) | **2006** | |
| Turkey – Chile | **2011** | |
| Turkey – EFTA | **1992** | |
| US – Colombia | **2012** | **X** |
| US – Panama | **2012** | |
| US – Australia | **2005** | **X** |
| US – Chile | **2004** | **X** |
| US – Peru | **2009** | **X** |

Note: "EU-Mercosur like" defined as in the text. See text and Table B1 for further details.
*The entry into force of the EEC/EU depends on the enlargement wave.

**Table B.3**
Countries included in the database

| |
|---|
| Argentina, Australia, Austria, Belgium/Luxembourg, Bolivia, Brazil, Canada, Switzerland, Chile, China, Colombia, Costa Rica, Czech Republic, Germany, Denmark, Dominican Republic, Ecuador, Spain, Finland, France, Great Britain, Greece, Guatemala, Guyana, Honduras, Haiti, Hungary, India, Ireland, Iceland, Italy, Jamaica, Japan, Rep. of Korea, Mexico, Nicaragua, Netherlands, Norway, New Zealand, Panama, Peru, Poland, Portugal, Paraguay, Russia, El Salvador, Slovakia, Sweden, Turkey, Uruguay, United States, Venezuela, and South Africa |

Note: Countries are ordered by their ISO three-digit code.

**Table B.4**
Summary of the EU-Mercosur agreement general equilibrium effects using alternative partial equilibrium estimates.

| **1. without globalization** | | | |
|---|---|---|---|
| | **Δ%exports** | **Δ%imports** | **Δ%welfare** |
| *MERCOSUR (avg.)* | *14.61* | *15.91* | *0.38* |
| *EU (avg.)* | *0.67* | *0.66* | *0.07* |
| **2. EU-LATAM agreements** | | | |
| | **Δ%exports** | **Δ%imports** | **Δ%welfare** |
| *MERCOSUR (avg.)* | *7.95* | *8.68* | *0.23* |
| *EU (avg.)* | *0.47* | *0.46* | *0.04* |
| **3. four-year intervals** | | | |
| | **Δ%exports** | **Δ%imports** | **Δ%welfare** |
| *MERCOSUR (avg.)* | *13.11* | *14.29* | *0.35* |
| *EU (avg.)* | *0.60* | *0.60* | *0.07* |
| **4. separate EU effect** | | | |
| | **Δ%exports** | **Δ%imports** | **Δ%welfare** |
| *MERCOSUR (avg.)* | *16.04* | *17.47* | *0.43* |
| *EU (avg.)* | *0.76* | *0.76* | *0.08* |
| **5. WTO** | | | |
| | **Δ%exports** | **Δ%imports** | **Δ%welfare** |
| *MERCOSUR (avg.)* | *14.03* | *15.28* | *0.37* |
| *EU (avg.)* | *0.64* | *0.64* | *0.07* |
| **6. MFN** | | | |
| | **Δ%exports** | **Δ%imports** | **Δ%welfare** |
| *MERCOSUR (avg.)* | *9.08* | *9.89* | *0.25* |
| *EU (avg.)* | *0.45* | *0.45* | *0.05* |

Note: Δ%exports, Δ%imports, Δ%welfare refer to percentage change with respect to the baseline (for baseline definition see text). “avg.” means average, and is calculated as a GDP PPP weighted average of country-level results. The number of the scenario corresponds to the number of the Column in Table 2 used for the partial equilibrium trade effects.
Source: Authors' elaboration on Horizontal Depth DB.

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