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INTERNATIONAL TRADE COOPERATION'S IMPACT ON THE WORLD ECONOMY

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International trade cooperation's impact on the world economy

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Abstract

In this study, we investigate three trade policy scenarios: i) the revival of multilateralism, ii) plurilateral cooperation, and iii) geopolitical rivalry. In the first scenario, both tariffs and NTMs are reduced on a multilateral basis. In the second scenario, varying groups of countries cooperate on specific topics, such as E-commerce and services. In the last scenario, two main blocks emerge: a Western block and an Eastern block. International cooperation breaks down between blocks, leading to an increase in tariffs and NTMs, with blocks of countries setting up their own set of rules. Our findings are based on simulations with the WTO Global trade Model which has a specific novel feature: the diffusion of ideas between countries as a by-product of trade. The simulations indicate that: (i) there is a lot at stake for global trade cooperation, with global real GDP increasing by 3.2% compared to the baseline under multilateral cooperation and decreasing by 5.4% under geopolitical rivalry; (ii) LDCs would gain the most from multilateralism (real GDP increases by 4.8%) due to technology spillover effects; (iii) under both "open" and "exclusive" plurilateral agreements on services, most regions are projected to gain, with larger gains to participants if the initiative is "open" than if it is "exclusive"; (iv) intermediate linkages in services sectors will be reinforced in all scenarios, except under geopolitical rivalry; (v) geopolitical rivalry leads to a 21 percentage points decrease in exports between Western and Eastern blocks from 46% to 25%; and (vi) the WTO has an important role to play in preserving a free trade environment for developing countries and LDCs. The simulations show that in a decoupling world, it would be essential for LDCs to continue trading with both Eastern and Western blocks.

JEL Codes: F13, F17

Keywords: Trade policy simulations, CGE modeling

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1   Introduction

The world trading system and the world economy are at a crossroads. The future of international trade cooperation is uncertain. The multilateral trading system, one of the pillars of post-WW2 prosperity is facing headwinds and may unravel or undergo significant transformation. How it evolves will have repercussions on the world economy. Less cooperation is likely to lead to less trade and to lower economic growth all over the world.

Several changes affecting international trade cooperation have taken place in recent years. At the multilateral level, despite the recent success of MC12, cooperation has been difficult. At the WTO, the impasse on the appointment of new Appellate Body members is impeding the functioning of the dispute-settlement mechanism and the negotiating function has all but stalled. Initiating, negotiating and concluding trade agreements, both for outstanding issues as well as for new issues has been challenging. There is a shared perception that consensus-based decision making is a factor inhibiting the ability of the WTO to engage in deliberations on new agreements. The question of whether, and to what extent, the WTO's more advanced emerging economies should take on greater obligations under the WTO agreements is particularly divisive, but aligning the positions of 164 members with often diverging interests and perspectives is generally difficult.

In this context, at the 11th Ministerial Conference in December 2017, like-minded groups of WTO members issued joint statements on advancing discussions on E-commerce, on developing a multilateral framework on investment facilitation, on launching a working group on micro, small and medium-sized enterprises (MSMEs) and on advancing ongoing talks on domestic regulation in services trade.[1] These negotiations do not involve all WTO members since some of them are opposed to plurilateral agreements, which they perceive as contradictory to WTO principles (e.g. multilateralism, decision by consensus, rules on amending WTO agreements) (Ungphakorn , 2021). Furthermore, countries who do not wish to participate fear potentially harmful economic consequences of not joining plurilateral agreements (Angeles et al., 2020). On the other hand, plurilateral negotiations are supported by some scholars who see agreements starting as plurilateral becoming multilateral ones (Nakatomi, 2014) and who perceive that "plurilateral cooperation is the most that is feasible" (Hoekman , 2020).

At the regional level, there has been an increase in the number of new regional trade agreements (RTAs) over the last 30 years (from 45 RTAs in force in 1990 to 401 in 2021), even though we observe a slowdown in the number of new RTAs entering into force over the last five years. The number of new RTAs entering into force increased by 657% from 1990 to 2010 compared to 25% from 2016 to 2021 (WTO, 2022b).[2] Trade relations between African countries have deepened with the entry into force in January 1st, 2021, of the African Continental Free Trade Area. At the same time however, the United

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[1]So far, only the negotiations on services domestic regulations have been successfully concluded on December 2nd 2021 by 67 WTO members.
[2]The data includes both RTAs that were notified to the WTO and non-notified RTAs.

Kingdom's (UK) withdrawal from the European Union (EU) voted in 2016 led to a time-consuming negotiation process. As new agreements had to be reached, the latter impeded trade between the UK and the EU, but also with its other trading partners.

In the background, geopolitical tensions among some large and influential countries have grown. Trade tensions between the United States of America (USA) and China, which started in 2018 materialized as an average 17% increase in bilateral tariffs and led to reduced bilateral trade, trade diversion effects, value chains re-organization in Asia and increased uncertainty (Bekkers and Schroeter, 2020). The war in Ukraine and the sanctions adopted by a number of countries against the Russian Federation have also disrupted longstanding economic relations (OECD, 2022, WTO, 2022a). In this context, the shortages and dependencies that have become more visible during crises have triggered talk of friend-shoring, re-shoring, fragmentation and de-coupling (Posen, 2022, Xing et al., 2021).

The aim of this paper is to analyse different paths for future trade cooperation and associated expected outcomes. What could these different trade scenarios be?

The first scenario we model in this paper is a revival of multilateralism. In this scenario, both tariffs and NTMs are reduced on an MFN basis at the multilateral level.

The second scenario investigates the economic impact of plurilateral agreements, focusing on services and E-commerce. Since plurilateral agreements may be implemented either on an "exclusive" or "open" basis, we develop four sub-scenarios of plurilateral cooperation.[3]

Finally, if the current trade tensions between the USA and China increase, geopolitical rivalry would lead to a bipolar trade war between these two economies and their respective allies (Rachman, 2021). In this situation, blocks of countries would start setting their own sets of rules, disregarding multilateral agreements. The last scenario showcases an economic decoupling between the USA and China (Bown and Irwin, 2019, Wei, 2019). We, however, create two sub-scenarios: one in which other countries have to choose one geopolitical block over the other, and one in which some developing countries remain outside of the conflict under the umbrella of the WTO.

We compare these three scenarios to a baseline scenario, which corresponds to a business-as-usual scenario. In this baseline, we account for all major regional agreements that entered into force until December 31st 2021 and assume status quo at the multilateral level. Detail on the baseline scenario can be found in Bekkers et al. (Forthcoming-a).[4]

We use a dynamic computable general equilibrium (CGE) model to simulate these three stylized scenarios and to evaluate their impact on global trade patterns and economy. Stylized scenarios are not

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[3]An important question surrounding plurilateral agreements concerns their implementation either as "exclusive" or "open" (Adlung and Mamdouh, 2018, Angeles et al., 2020). Under an "exclusive" (or "Most Favoured Nation (MFN) non-compliant") agreement, only participants reap the benefits of trade liberalization, whereas under an "open" (or "MFN-compliant") agreement, all trading partners benefit from reduced trade costs. An example of an "open" agreement is the Agreement on Services Domestic Regulation.

[4]In this paper, we do not consider the Russo-Ukrainian conflict, nor environmental policies that require dedicated work and are covered in WTO (2022a), Bacchetta et al. (Forthcoming-a), Bacchetta et al. (Forthcoming-b), and Bekkers et al. (Forthcoming-c).

supposed to project with precision the future state of the economy but rather to explore the consequences of different paths on a set of economic variables.

Previous studies have investigated the impact of multilateral cooperation. They modelled the Doha Round and various scenarios of trade liberalization to understand their impact in terms of trade and welfare (Adler et al. (2009), Anderson and Martin (2005), Anderson et al. (2006), Bekkers and Keck (Forthcoming), Bouët et al. (2005), Bouët and Laborde (2009), Bouët et al. (2007), Decreux and Fontagne (2011), Francois et al. (2005), Hoekman and Nicita (2010)). The simulation work on the Doha Round tends to find smaller projected increases in GDP than our revival of multilateralism scenario because most of the Doha Round work focuses on reductions in tariffs and does not consider NTMs. Furthermore, the model employed in the current paper generates larger GDP effects because it contains diffusion of ideas through trade.

Plurilateral agreements have been analysed from a legal and political economy perspective, rather than from economic modelling Hoekman and Mavroidis (2015b). A set of recent studies focus on USA trade policy (Demertzis and Fredriksson, 2018, Devarajan et al., 2018, Hübler and Herdecke, 2020, Robinson and Thierfelder, 2019) and the USA-China trade war (Bekkers and Teh, 2019, Bolt et al., 2019, Bouët and Laborde, 2018, Guo et al., 2018, Ossa, 2014). Finally, some articles endorse a more general approach to trade policy analysis (Bekkers, 2019, Chateau et al., 2014, Ellis et al., 2018, Fontagné et al., 2017, WTO, 2013).

Robinson and Thierfelder (2019) investigate a scenario in which the USA would isolate itself (by raising tariffs on imports from its trading partners), and determines the impact of USA isolation on trade. Demertzis and Fredriksson (2018) and Hübler and Herdecke (2020) focus on EU and/or China responses to USA tariffs, while Devarajan et al. (2018) explore responses of developing countries to USA tariffs. In this article, we develop scenarios involving many countries, both developed and developing, and analyse the impact of various trade policies not only on trade variables, but also on production and welfare outcomes. Studies by Guo et al. (2018) and Bolt et al. (2019) concern the escalating trade war between the USA and China. Global trade wars are further analysed by Ossa (2014), using a new quantitative trade model, and by Bekkers and Teh (2019), using a dynamic CGE model. Ossa (2014) implements a Nash equilibrium where the average tariff is 63.4 %, which leads to an average welfare loss of 2.9 %. In Bekkers and Teh (2019), tariffs rise on average by 32 %, leading to a reduction in global GDP of 2 %. The decoupling scenarios in the current paper lead to larger losses although tariff increases are smaller and tariffs are only increased between blocks because the employed model features technology spillovers from trade.

Finally, Bekkers (2019) analyses the impact of changes in future trade policy. The author brings together the above-mentioned investigations by constructing five scenarios: passive isolation of the USA, active isolation of the USA, global trade war, breakdown of international trade co-operation, and revival

of multilateralism. Although the last scenario is also explored in the current paper, the other scenarios reflect in what direction (potential decoupling and multilateralism) policy debates about future trade relations have moved.

This paper complements the literature on trade policy simulations in three ways. Firstly, we build on recent trade-related events and ongoing trade negotiations, to the extent possible, to build the scenarios.[5] For example, we focus on decoupling of USA-China relations and develop scenarios for plurilateral cooperation. Secondly, we use an updated version of the WTO Global Trade model, which includes GDP and population growth, changes in labor force participation, changes in savings rates, differences in productivity growth between sectors, non-homothetic CES preferences, changes in intermediate demand structure, changes in oil and natural resource prices, and changes in trade costs (Bekkers et al., Forthcoming-a). Trade costs do take into consideration Brexit, the Trade Facilitation Agreement (TFA), forward-looking economic partnership agreements (EPAs), and recently signed free trade agreements (FTAs). The model also allows for idea diffusion (Goes and Bekkers (Forthcoming) and Buera and Oberfield (2020)), which is a feature of 21st century economies. Thirdly, we use the latest data on ad valorem equivalents of non-tariff measures (NTMs) for both goods and services to simulate shocks on NTMs. We develop our own estimates of ad valorem equivalents of various trade policies when necessary. For example, we construct ad valorem equivalents of data flow regulations based on the Services Trade Restrictiveness Index.

The projections lead to six main results. First, there is a lot at stake for global economic growth and economic development from further global trade cooperation. The difference between "further multilateral cooperation" and geopolitical rivalry is 6.4% of GDP growth for developed countries, 10.2% for developing countries, and 11.3% for LDCs. This loss of geopolitical rivalry relative to further multilateral cooperation far exceeds for example the long-run reduction in potential GDP because of the Great Financial Crisis for OECD countries which is estimated to be about 3.5% (Ollivaud and Turner, 2014). Although GDP losses during a large recession like the Great Financial Crisis are sometimes much larger than 6.4%, countries tend to recover after the recession and make up for a large part of the loss in GDP. The long-run GDP losses from geopolitical rivalry compared to multilateral cooperation instead would be permanent.

Second, low-income regions stand to gain most from an integrated global economy, because of technology spillover effects. LDCs' real GDP and exports are projected to rise by 4.8% and 20.6%, respectively. Third, under both "open" and "exclusive" plurilateral agreements on services most regions are projected to gain. These gains would be much larger, in particular for the participants to the plurilaterals, if the plurilaterals would be "open". Also, participants are projected to benefit from a larger increase in GDP than non-participants suggesting that they would have an incentive to join the plurilaterals. Further-

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[5]Stylized scenarios do not, however, aim at reflecting specific elements nor potential conclusions of ongoing negotiations.

more, comparative advantage is projected to improve in services in developing countries with the "open" plurilateral agreement on services.

Fourth, intermediate linkages in services sectors will be reinforced under both multilateral and plurilateral cooperation, whereas they will be weakened under geopolitical rivalry. Fifth, under geopolitical rivalry, trade between blocks would fall drastically. Exports between Western and Eastern blocks would decrease by 21 percentage points from 46% in 2050 without decoupling to 25% with decoupling. Sixth, under partial rivalry the regions not part of the Eastern or Western block are projected to see their GDP increase instead of fall. Hence, preserving LDCs from participating in a trade war is of crucial interest for their development, since the simulations show that in a decoupling world, it would be essential for LDCs to continue trading with both Eastern and Western blocks.

The rest of this paper is organized as follows. Section 2 presents the scenarios for future trade policies, the model used and reports the shocks imposed to tariffs and NTMs with the technical implementation of the scenarios delegated to the appendix. Section 3.2.3 analyses the results, outlining first the projected changes in trade and output and then the projected changes in the structure of trade (trade shares, revealed comparative advantage, and intermediate linkages). Section 4 concludes.

2 Scenarios and model

In this section, we describe the scenarios, the model used, the technical implementation of each scenario and conclude by reporting the shocks to tariffs and NTMs for each scenario.

2.1 Scenarios description

We create three main scenarios to present three directions for future trade policy: revival of multilateralism, plurilateral cooperation, and geopolitical rivalry.

1. Revival of multilateralism: all countries cooperate on a global scale. As a result, both tariffs and NTMs are reduced on a MFN basis.

2. Plurilateral cooperation: this main scenario is split into four sub-scenarios:

   (a) "Exclusive" plurilateral cooperation on E-commerce: a set of countries exclusively cooperate on E-commerce. This leads to a reduction in trade costs in digitally-intensive services sectors only between countries who join the agreement. Exporters who are not part of the plurilateral agreement do not benefit from reduced trade costs in these sectors.

   (b) "Open" plurilateral cooperation on E-commerce: similar to the previous scenario, a subset of countries cooperate on E-commerce, leading to reductions in NTMs in digitally-intensive services sectors. However, this cooperation is implemented on a MFN basis. This means that

all exporters benefit from the reductions in trade costs implemented by countries participating in the agreement, regardless of whether they have themselves joined it. However, on the importer side trade costs only fall for participants in plurilateral cooperation.

(c) "Exclusive" plurilateral cooperation on services: a set of countries reduce their NTMs on all services imported from participating countries. Countries who haven't joined the agreement do not benefit from these trade costs reductions.

(d) "Open" plurilateral cooperation on services: similar to the previous scenario, countries participating in the agreement reduce NTMs on all services sectors. These trade costs reductions are, however, applied on a MFN basis.

3. Geopolitical rivalry: this scenario is split into two sub-scenarios:

(a) Full rivalry: this scenario models rising trade costs between a Western block and an Eastern block. Under this scenario, international cooperation breaks down between blocks and tariffs increase to their trade war level. Trade costs within each block remain stable. All countries join a block.

(b) Partial rivalry: this scenario is similar to the previous scenario in terms of rising costs but some least-developed and developing countries remain outside of the conflict. Therefore, they do not face, nor do they apply any increasing trade costs.

We implement these scenarios using the WTO Global Trade Model, described in the following subsection.

2.2 The WTO Global Trade Model

The WTO Global Trade Model is a recursive dynamic computable general equilibrium (CGE) model, extended from the static GTAP model (Corong et al., 2017). It is appropriate to generate global trade projections and to study the impact of various trade policies on a large number of countries and sectors.

In the WTO Global Trade Model, regional households collect income and spend it on three types of final goods: government, private and savings. A global bank collects these regional savings that are used to finance investment goods.

On the production side, perfectly competitive firms produce homogeneous products. They employ five factors of production (skilled labor, unskilled labor, capital, land, and natural resources) and demand goods from other firms, reflecting intermediate linkages. Capital and labor are perfectly mobile, whereas land is a sluggish factor, and natural resources is sector-specific.

The model considers international trade linkages: commodities may be produced locally or imported, according to an Armington CES specification. Imports are further differentiated by region of origin. Of

particular interest for this paper, we can model a change in trade barriers either through a change in tariffs or through a change in iceberg trade costs (e.g. for NTMs).

In equilibrium all markets clear: goods market, factor market, transport services market, and global savings market.[6]

This model features a "diffusion of ideas" module, which allows ideas to flow from one market to another in proportion to the trade linkages between them (Buera and Oberfield, 2020) (see Bekkers et al. (Forthcoming-a) for a detailed description of the calibration and implementation of this module). As found in Goes and Bekkers (Forthcoming), we expect this feature to increase the size and variation of gains/losses in GDP and exports across regions, especially when modeling large shocks to trade costs. However, three main elements distinguish this study from Goes and Bekkers (Forthcoming). First, in this paper we embed diffusion of ideas in a model of perfect competition with Armington preferences to have a tractable model which can be solved for a setting with a larger number of regions and sectors, whereas Goes and Bekkers (Forthcoming) work with a structure of Bertrand competition.[7] Second, the shocks included in this paper have a more detailed underpinning. In Goes and Bekkers (Forthcoming) trade the decoupling scenarios are based on a uniform increase in tariffs and/or trade costs, whereas in the current paper trade cost increases consist of both tariff and NTM increases varying by country based on econometric estimates from the literature. Third, we consider two additional scenarios: enhanced multilateralism and plurilateral cooperation. The impact of the division into two geopolitical blocks would be similar in the two papers. However, we also explore a division into three blocks with some developing countries and LDCs remaining neutral.

We calibrate the model based on the GTAP 10 Data Base, using 2014 as the year of reference. We aggregate the data to 25 sectors and 25 regions. Sectoral and regional aggregations may be found in Table A.1.

2.3   Overview of shocks

This subsection provides an overview of the shocks to tariffs and NTMs for eah of the scenarios.

1. Revival of multilateralism

   Tariff reductions stemming from multilateral cooperation are presented in column 2 of Tables 1, 2 and 3.[8] They include the above-mentioned three shocks: reversal of trade tensions, reduction in proportion to negative spillover effects, and reduced uncertainty. They are the largest for exports of Brazil, Indonesia, China, Mexico and India (-7.08%, -4.74%, -4.62%, -4.57%, -4.18%, respectively).

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[6] Further description of the WTO Global Trade Model can be found in Aguiar et al. (2019).

[7] In the model with Bertrand competition the GTAP basedata have to be modified to incorporate profits in the model by splitting initial factor income flows into profits and factor income with the risk that factor income, being the residual, becomes negative.

[8] All tariffs and NTM shocks are trade-weighted averages. We phase-in these variations annually, starting in 2020 until 2034. The model runs until 2050 to provide long-term projections.

From the importer side, Sub-Saharan Africa LDC, Sub-Saharan Africa Other, and Asia LDCs report the largest reductions in tariffs (-7.38%, -7.00%, and -6.63%, respectively). Sectors reporting the largest reductions in tariffs are crops, textile, apparel and leather, and livestock (-9.19%, -6.26%, and -5.77% respectively).

Reductions in NTMs are presented in column 3 of Tables 1, 2 and 3. They include a 25% decrease in NTMs for all sectors and the reduced uncertainty effect. Almost all regions report smaller reductions in NTMs than in tariffs, which is explained by the rather conservative assumptions on NTM reductions. From a sectoral perspective, services sectors benefit from greater liberalization than merchandise goods with the latter mainly displaying tariff reductions.

Table 1: Reductions in tariffs and NTMs by exporter (cumulative 2020-2050, in %)

Regions	S1-Multilateralism		S2-Plurilateralism				S3- Geopolitical rivalry			
			E-commerce		Services		S3a-Full rivalry		S3b-Partial rivalry	
	Tariffs	NTMs	S2a-"Exclusive"	S2b-"Open"	S2c-"Exclusive"	S2d-"Open"	Tariffs	NTMs	Tariffs	NTMs
	All goods	All sectors	6 services sec.	6 services sec.	All services	All services	All goods	All sectors	All goods	All sectors
Asia LDC	-2.66	-1.74	-0.06	-0.14	0.00	-0.39	22.91	5.80	0.00	0.00
Australia	-1.22	-2.11	-0.28	-0.28	-0.81	-0.81	9.64	4.33	9.09	3.28
Brazil	-7.08	-1.79	-0.30	-0.30	-0.64	-0.64	11.38	5.20	10.26	3.81
Canada	-0.91	-1.22	-0.19	-0.19	-0.57	-0.57	1.35	1.38	1.13	0.86
China	-4.62	-1.61	-0.10	-0.10	-0.30	-0.30	19.06	5.71	19.06	5.71
EU	-1.20	-1.45	-0.59	-0.59	-1.23	-1.23	3.19	2.78	2.72	1.99
EFTA	-1.18	-2.47	-0.59	-0.59	-1.15	-1.15	2.95	3.36	2.27	2.20
UK	-1.73	-3.00	-0.76	-0.76	-1.84	-1.84	2.95	3.89	2.21	2.24
Indonesia	-4.74	-1.65	-0.20	-0.20	0.00	-0.45	16.81	5.42	0.00	0.00
India	-4.18	-2.46	0.00	-0.69	0.00	-1.42	14.79	8.08	0.00	0.00
Japan	-2.63	-1.70	-0.37	-0.37	-0.55	-0.55	10.85	5.20	8.92	3.71
Republic of Korea	-2.60	-1.90	-0.25	-0.25	-0.43	-0.43	13.02	5.68	10.39	4.17
Latin America	-3.27	-2.06	-0.26	-0.43	-0.58	-0.91	3.97	3.41	3.26	2.41
Mexico	-4.57	-0.92	-0.12	-0.12	-0.20	-0.20	1.05	0.81	0.92	0.60
Middle East and North Africa	-1.55	-2.27	-0.20	-0.49	-0.41	-0.93	8.11	5.86	8.11	5.86
Other Asia countries	-1.55	-3.06	-1.29	-1.53	-1.74	-2.05	7.56	6.74	7.56	6.74
Rest of World	-1.09	-2.03	-0.17	-0.40	-0.50	-0.87	10.34	6.43	10.34	6.43
Russian Federation	-1.00	-1.82	-0.34	-0.34	-0.69	-0.69	8.61	7.02	8.61	7.02
Kingdom of Saudi Arabia	-1.08	-1.72	-0.03	-0.03	-0.05	-0.05	2.57	3.79	2.57	3.79
Southeast Asia	-1.81	-2.14	-0.64	-0.65	-0.97	-1.11	12.72	6.17	0.00	0.00
Sub-Saharan Africa LDC	-2.06	-1.82	-0.01	-0.22	0.00	-0.58	5.72	3.97	0.00	0.00
Sub-Saharan Africa other	-1.51	-1.86	-0.08	-0.23	-0.28	-0.56	10.32	5.52	0.00	0.00
Türkiye	-2.84	-2.31	-0.71	-0.71	-1.08	-1.08	7.29	4.83	6.83	4.15
USA	-1.87	-2.62	-0.65	-0.65	-1.52	-1.52	3.19	4.08	2.24	2.45
South Africa	-1.91	-1.67	0.00	-0.24	0.00	-0.52	16.12	5.01	0.00	0.00

Table 2: Reductions in tariffs and NTMs by importer (cumulative 2020-2050, in %)

Regions	S1-Multilateralism		S2-Plurilateralism				S3- Geopolitical rivarlry			
			E-commerce		Services		S3a-Full rivalry		S3b-Partial rivalry	
	Tariffs	NTMs	S2a-"Exclusive"	S2b-"Open"	S2c-"Exclusive"	S2d-"Open"	Tariffs	NTMs	Tariffs	NTMs
	All goods	All sectors	6 services sec.	6 services sec.	All services	All services	All goods	All sectors	All goods	All sectors
Asia LDC	-6.63	-2.13	-0.07	-0.08	0.00	0.00	3.27	2.95	0.00	0.00
Australia	-1.79	-3.77	-0.25	-0.28	-1.10	-1.21	3.81	5.00	2.79	3.28
Brazil	-5.69	-2.38	-0.66	-0.74	-1.36	-1.54	2.89	4.02	2.33	2.77
Canada	-0.88	-2.41	0.00	0.00	-1.00	-1.08	2.17	1.84	1.66	1.29
China	-2.75	-2.47	-1.66	-1.85	-1.03	-1.15	14.03	6.47	14.03	6.47
EU	-0.96	-1.21	-0.46	-0.51	-1.13	-1.24	5.99	2.87	4.39	1.96
EFTA	-0.88	-2.62	-0.34	-0.37	-1.20	-1.33	0.94	2.33	0.64	1.44
UK	-1.28	-2.49	-0.35	-0.39	-1.25	-1.40	7.03	3.48	4.64	2.17
Indonesia	-1.93	-1.45	-0.64	-0.71	0.00	0.00	1.92	5.43	0.00	0.00
India	-2.59	-2.65	0.00	0.00	0.00	0.00	3.02	4.87	0.00	0.00
Japan	-1.90	-1.64	-0.23	-0.25	-0.79	-0.87	11.86	5.02	7.84	3.56
Republic of Korea	-3.10	-2.35	-0.61	-0.70	-0.81	-0.90	5.53	5.01	4.28	3.77
Latin America	-3.75	-2.02	-0.14	-0.16	-0.56	-0.61	1.98	2.87	1.62	2.16
Mexico	-1.33	-0.78	0.00	0.00	-0.30	-0.34	0.93	2.32	0.73	1.93
Middle East and North Africa	-3.76	-2.46	-0.11	-0.12	-0.36	-0.38	5.29	6.94	5.29	6.94
Other Asian countries	-1.87	-2.48	-0.28	-0.31	-0.75	-0.83	7.66	6.02	7.66	6.02
Rest of World	-2.59	-2.30	-0.30	-0.33	-0.56	-0.61	8.86	5.71	8.86	5.71
Russian Federation	-5.06	-3.26	-0.62	-0.69	-1.25	-1.39	13.99	8.09	13.99	8.09
Kingdom of Saudi Arabia	-2.24	-2.31	-0.20	-0.24	-0.73	-0.82	3.55	6.94	3.55	6.94
Southeast Asia	-2.30	-2.08	-0.30	-0.33	-0.90	-0.97	4.99	6.15	0.00	0.00
Sub-Saharan Africa LDC	-7.38	-2.98	0.00	0.00	0.00	0.00	2.92	6.25	0.00	0.00
Sub-Saharan Africa other	-7.00	-2.43	-0.26	-0.29	-0.86	-0.94	6.54	7.34	0.00	0.00
Türkiye	-1.61	-1.87	-0.14	-0.15	-0.38	-0.45	1.57	4.47	1.16	3.43
USA	-2.79	-1.29	-0.01	-0.01	-0.75	-0.87	13.82	3.58	8.41	2.28
South Africa	-4.44	-2.02	0.00	0.00	0.00	0.00	4.14	6.19	0.00	0.00

Table 3: Reductions in tariffs and NTMs by sector (cumulative 2020-2050, in %)

Regions	S1-Multilateralism		S2-Plurilateralism				S3- Geopolitical rivalry			
			E-commerce		Services		S3a-Full rivalry		S3b-Partial rivalry	
	Tariffs	NTMs	S2a-"Exclusive"	S2b-"Open"	S2c-"Exclusive"	S2d-"Open"	Tariffs	NTMs	Tariffs	NTMs
	All goods	All sectors	6 services sec.	6 services sec.	All services	All services	All goods	All sectors	All goods	All sectors
Accommodation and recreation	-1.30	-4.77	0.00	0.00	-4.46	-4.83	0.00	8.41	0.00	5.67
Chemicals	-2.61	-1.11	0.00	0.00	0.00	0.00	8.70	2.97	6.63	2.07
Communication	-0.14	-6.56	-2.52	-2.85	-6.09	-7.05	0.00	7.42	0.00	3.98
Computer, electronic and optic	-4.12	-1.46	0.00	0.00	0.00	0.00	11.38	2.86	8.69	2.21
Crops	-9.19	-1.34	0.00	0.00	0.00	0.00	13.81	5.77	10.77	4.03
Electrical equipment	-1.68	-0.95	0.00	0.00	0.00	0.00	14.56	3.49	10.98	2.77
Finance	-0.34	-3.66	-3.03	-3.21	-3.60	-3.80	0.00	6.32	0.00	3.75
Livestock	-5.77	-1.51	0.00	0.00	0.00	0.00	6.27	2.68	5.10	2.11
Machinery and equipment	-1.35	-0.90	0.00	0.00	0.00	0.00	10.92	2.99	8.59	2.20
Metals	-1.95	-1.05	0.00	0.00	0.00	0.00	7.45	3.11	5.50	2.19
Motor vehicles	-3.89	-1.03	0.00	0.00	0.00	0.00	7.66	2.90	6.25	2.21
Oil	-0.72	-1.68	0.00	0.00	0.00	0.00	2.16	2.68	1.77	2.17
Other business services	-0.34	-4.27	-1.52	-1.72	-3.89	-4.37	0.00	8.45	0.00	4.39
Other extraction	-0.69	-1.21	0.00	0.00	0.00	0.00	7.70	1.73	5.98	1.20
Other goods	-2.58	-1.08	0.00	0.00	0.00	0.00	11.43	3.29	8.35	2.43
Other services	-0.05	-5.09	0.00	0.00	-4.33	-4.70	0.00	8.40	0.00	5.63
Petroleum, coal products	-0.54	-0.76	0.00	0.00	0.00	0.00	1.60	6.11	1.29	4.52
Pharma, rubber, plastics	-1.30	-1.23	0.00	0.00	0.00	0.00	8.98	2.72	6.12	1.87
Processed food	-4.57	-1.59	0.00	0.00	0.00	0.00	7.06	4.65	3.81	2.61
Real estate activities	0.00	-4.79	0.00	0.00	-4.11	-4.52	0.00	9.67	0.00	6.88
Textiles, apparel, leather	-6.26	-1.54	0.00	0.00	0.00	0.00	18.24	4.34	10.65	2.76
Trade	0.00	-5.21	-5.08	-5.33	-5.16	-5.46	0.00	9.82	0.00	7.70
Transport	0.00	-4.84	-2.55	-3.00	-4.28	-4.89	0.00	8.83	0.00	5.49
Transport equipment nec	-1.40	-0.84	0.00	0.00	0.00	0.00	7.55	2.85	6.12	2.01
Utilities and construction	0.00	-4.15	-2.69	-2.88	-3.84	-4.37	0.76	6.51	0.65	5.17

2. Plurilateral cooperation

NTM reductions stemming from plurilateral cooperation are presented in columns 4-7 of Tables 1, 2 and 3.

Under plurilateralism scenarios (S2a, S2b, S2c, S2d), we only impose reductions in NTMs. Under both plurilateral scenarios on E-commerce (S2a and S2b), NTM reductions focus on the above-mentioned six services sectors: communication, finance, other business services, transport, trade, utilities. Under both plurilateral scenarios on services (S2c and S2d), we impose NTM reductions in all services sectors.

Under the plurilateral "exclusive" scenario on E-commerce (S2a), we observe reductions in NTMs on the import side for almost all regions. As India and South Africa are not part of the agreement on E-commerce, their NTMs remain at the same level and they do not benefit from any reductions in trade costs (Tables 1 and 2). If the agreement is however implemented on a MFN basis (S2b), these non-participating exporters benefit from reductions in NTMs. For regions composed of several countries, such as the Middle East and North Africa, and Sub-Saharan Africa LDC, within which some countries participate in the agreement, we observe larger reductions in NTMs under the "open" scenario (S2b) compared to the "exclusive" scenario (S2a) (Table 1). For participating countries, NTM reductions are similar regardless of whether the agreement is implemented on an "exclusive" basis or not (Table 1). On the importer side, non-participating countries don't reduce their NTMs (under both S2a and S2b) (Table 2). We observe that Canada and Mexico, who participate in the agreement on E-commerce, report no change in NTMs. This is explained by the fact these countries already have a low STRI, which leads to no change in their respective STRI and no change in their NTMs. From a sectoral perspective, such a plurilateral agreement would significantly affect the trade services sector (Table 3).

Under the plurilateral agreement on services (S2c and S2d), reductions in NTMs are larger than under the plurilateral scenarios on E-commerce because all services sectors are impacted in the former, whereas only six services sectors are affected in the latter. Five exporters report null reductions in trade costs under scenario S2c ("exclusive" plurilateral agreement on services): Asia LDC, India, Indonesia, South Africa, and Sub-Saharan Africa LDC (Table 1). Reductions for these exporters are null since they are not yet part of the negotiations and scenario S2c considers an "exclusive" agreement. If the agreement is implemented on a MFN basis (S2d), all countries benefit from reductions in trade costs, even non-participating regions. From the importer side, the above-mentioned five regions report null variation in trade costs under both S2c and S2d since they do not decrease NTMs regardless of whether the agreement is implemented on a MFN basis or not (Table 2). From a sectoral perspective, the largest NTM reductions occur in the trade and

communication services sectors (Table 3).

3. Geopolitical rivalry

Tariffs and NTM increases under full rivalry are presented in column 8 and 9 of Tables 1, 2 and 3.

"Tariffs" include the reversal of trade tensions within blocks and an increase in tariffs to trade war level between blocks. Asia LDC and China's exports face the highest tariffs increase (22.91% and 19.06%, respectively) (Table 1). On the importer side, China, the Russian Federation and the USA report the largest tariffs increases (14.03%, 13.99%, and 13.82%) (Table 2). Tariffs are the highest on textile, apparel and leather, electrical equipment, and crops (18.24%, 14.56% and 13.81% respectively) (Table 3).

Increases in NTMs reflect the costs associated to a breakdown of multilateral relations. India's and the Russian Federation's exports face the highest NTM increase (8.08% and 7.02%, respectively) (Table 1). The Russian Federation also reports the highest increase in its own NTMs under this scenario (8.09%) (Table 2). NTMs are raised in all sectors, with larger increases in services sectors compared to goods (Table 3).

Under partial rivalry, we obtain similar shocks (columns 10 and 11 of Tables 1, 2 and 3). Countries remaining outside of the conflict do not face increasing trade costs, nor do they impose additional tariffs nor NTMs on any other region. Shocks for these countries are therefore set to zero, and shocks imposed or faced by other countries are lower under partial rivalry than full rivalry.

3 Results of the simulations

In this section, we analyse the projected effect of the three trade policy scenarios on trade and output as measured by real exports and real GDP and on the structure of trade as measured by changes in trade shares, revealed comparative advantage, and the strength of intermediate linkages. For the impact on trade and output we first analyse the results of the Scenarios 1 and 3 (Revival of multilateralism and Geopolitical rivalry) and then on Scenarios 2 (Plurilateralism).

3.1 Trade and output effects

3.1.1 Revival of multilateralism and geopolitical rivalry

We start by comparing the polar cases of a revival of multilateralism and geopolitical rivarly. Under the revival scenario (S1) real GDP is projected to increase in all regions compared to the baseline (Table 5). Under geopolitical rivalry with the world split into two blocks (full rivalry, S3a), almost all countries would suffer from a decrease in real GDP. We observe a similar patterns for exports (Table 4) with an

increase in exports from all regions in the revival scenario (S1) and the largest export losses for all regions in the full rivalry scenario (S3a), with the exception of Canada and Mexico.

Under the multilateral scenario lower income countries benefit more and under the full rivalry scenario they would face larger losses. In the revival scenario LDCs and developing countries benefit the most (a 4.77% and a 3.56% increase in GDP, respectively), whereas developed economies would see their GDP increase by 2.43%. In the full rivalry scenario developing countries and LDCs would face a reduction in GDP of respectively -6.55% and -6.54%, relative to the baseline, whereas the loss of developed countries would be only 3.97%. For trade the pattern is similar for the revival scenario. In this scenario exports increase most from LDCs and developing countries, respectively by 20.55% and 13.95% and only by 10.41% for developed countries.[9] In the fully rivalry (S3a) scenario trade losses are closer to each other with developed, developing and least-developed countries losing 18.43%, 18.39%, and 14.31% in exports, respectively (Table 4).

The larger GDP impact of both enhanced cooperation and fragmentation on low-income regions is due to the fact that low-income regions tend to benefit most from the diffusion of ideas through trade in the model. Furthermore, under the revival scenario the lower income countries benefit from a larger reductions in trade costs and under the geopolitical rivalry scenario their trade costs would increase more (Table 1), explaining also the variation in export changes. These changes in trade costs lead to larger export changes in low-income countries (see Section 3.2) and therefore larger changes in real GDP. Trade costs change more for low-income regions under the revival scenario, because the initial trade costs are larger and a revival of multilateralism can thus realize larger trade cost reductions.[10]

Mexico represents an exception to the projected GDP reduction under geopolitical rivalry since its GDP is projected to increase by 0.71%. In this scenario, Mexico is able to increase its exports of goods by 17% whereas most countries face reductions in goods exports. We observe a trade diversion effect, explaining the small gain in Mexico's GDP. Mexico's trade is reinforced with its long-standing trading partner, the USA. Bilateral exports of Mexico to the USA increase by 55%. This is explained by the substantial increase in USA tariffs on imports from countries in the Eastern block (Table 2). Moreover, Mexico's exports to other countries such as the United Kingdom and Japan, whose imports from China and some of its allies were considerable before the shock, increase by 47% and 43%, respectively. China represented Japan's number one source of imports and the United Kingdom's number three source of imports.

This result aligns with De la Torre et al. (2015) who show that the rise of the South, led by China, negatively affects net exporters of manufactured goods in Latin America. In particular, De la Torre et

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[9]According to baseline results, combined exports of developing and least-developed economies are projected to overtake developed economies' exports by 2035.

[10]The magnified effects for low-income regions are consistent with changes in the baseline scenario from 2020 to 2050 described in Bekkers et al. (2022). The share of developed countries' GDP in global GDP is projected to fall to the benefit of developing economies and LDCs.

Table 4: Variations in exports by scenario (cumulative 2020-2050, in %)

Region	S1	S2a	S2b	S2c	S2d	S3a	S3b	Opportunity cost
Asia LDC	22.95	-0.30	-0.37	-0.19	-0.46	-10.38	8.99	33.33
Australia	7.68	0.97	0.98	4.84	5.20	-11.27	-6.65	18.95
Brazil	22.70	1.67	1.86	4.49	5.14	-11.06	-9.15	33.76
Canada	4.38	-0.11	-0.19	4.80	5.33	1.21	-2.91	3.17
China	17.61	4.44	5.22	3.68	4.34	-25.66	-28.36	43.27
EU	7.29	1.51	1.63	4.65	5.33	-5.29	-6.02	12.58
EFT	8.58	0.87	0.90	4.49	5.13	-7.48	-8.13	16.06
UK	12.68	1.67	1.73	6.35	7.04	-14.29	-8.64	26.97
Indonesia	13.79	2.71	3.15	-0.10	-0.18	-12.96	-8.55	26.75
India	20.74	-0.33	-0.17	-0.23	-0.15	-13.95	7.59	34.69
Japan	7.69	0.73	0.83	3.86	4.50	-29.28	-20.21	36.97
Republic of Korea	13.60	0.58	0.73	2.61	3.17	-42.37	-35.38	55.97
Latin America	12.41	0.57	0.93	2.72	3.60	-5.40	-5.72	17.81
Mexico	12.79	-0.45	-0.56	2.15	2.80	16.97	2.55	-4.18
Middle East and North Africa	15.07	0.35	0.94	1.59	2.67	-20.18	-21.27	35.25
Other Asia countries	9.03	0.99	1.17	3.46	3.94	-6.31	-8.15	15.34
Russian Federation	10.51	2.32	2.49	4.60	5.01	-14.44	-14.84	24.95
Kingdom of Saudi Arabia	4.25	0.29	0.38	1.54	1.83	-6.31	-6.56	10.56
Southeast Asia	7.59	0.08	0.11	2.55	2.87	-6.71	19.35	14.30
Sub-Saharan Africa LDC	19.58	-0.54	-0.24	-0.50	0.31	-14.82	4.73	34.4
Sub-Saharan Africa other	15.29	0.35	0.66	2.52	3.30	-16.69	3.46	31.98
Türkiye	11.72	0.97	1.08	3.39	4.38	-7.43	-10.70	19.15
USA	13.28	0.30	0.20	4.33	4.97	-13.71	-7.50	26.99
South Africa	12.80	-0.28	0.01	-0.21	-0.05	-17.96	4.05	30.76
Developped	10.41	0.98	1.04	4.22	4.90	-18.42	-13.41	28.83
Developing	13.95	1.94	2.36	2.87	3.48	-18.39	-8.95	32.34
LDCs	20.55	-0.46	-0.26	-0.40	0.12	-14.31	6.43	34.86
Global	12.78	0.87	1.07	2.80	3.38	-13.12	-6.39	25.9

Note: S1: revival of multilateralim; S2a: "Exclusive" plurilateral agreement on E-commerce; S2b: "Open" plurilateral agreement on E-commerce; S2c: "Exclusive" plurilateral agreement on services; S2d: "Open" plurilateral agreement on services; S3a: full rivalry; S3b: partial rivalry . We do not report RoW as it serves as a residual when fixing the trade balance.

al. (2015) report that Mexico is negatively affected by the rise of China since its manufactured export basket is similar to that of China. Trade decoupling of USA and China would hence reverse this trend, favoring Mexico's exports of manufactured products to the USA.

Comparing scenario S1 with scenario S3a, we can compute the "opportunity cost" of not cooperating (last column of Table 5). At the global level, cooperation could bring an additional 8.65 percentage points in GDP gains compared to full rivalry. The opportunity cost of not cooperating is the highest for LDCs (11.31 percentage points) and developing countries (10.11 percentage points), whereas it is "only" 6.40% for developed economies. For trade the picture is similar: the export loss of not cooperating is larger for LDCs (34.86 percentage points) and developing countries (32.34 percentage points) than for developed economies (28.83%). Hence, the difference in opportunity costs of not cooperating is larger for GDP which is due to the fact that the strength of technology diffusion is bigger for low income regions.

Under the partial rivalry scenario (S3b), regions remaining outside of the conflict benefit from a higher GDP compared to the baseline. Asia LDC, India, Indonesia, South Africa, Southeast Asia, Sub-Saharan Africa LDC and Sub-Saharan Africa Other would see their GDP increase by 0.91% to 5.77%. As a result, LDCs' average GDP is projected to increase by 1.92%. Furthermore, LDCs are projected to increase their exports by 6.43% (Table 4). Compared with the full rivalry scenario (3a) Asia LDC and Sub-Saharan Africa LDC respectively gain 9 and 8 percentage points in GDP under the partial rivalry scenario (3b). The impact on trade and GDP changes from negative to positive when moving from full rivarly to partial rivalry because under the latter scenario trade costs are not increased vis-a-vis trading partners. This means that the regions staying outside of the decoupling trend can benefit from increased trade with trading partners in both the Eastern and Western block because of trade diversion which in turn promotes technology spillovers.

3.1.2 Plurilateralism in E-commerce and services

Under plurilateral scenarios on E-commerce (S2a and S2b), where trade cost reductions are the smallest and affect only six services sectors, we observe smaller variations in real GDP and trade than in the other scenarios. Projected increases in global exports and global GDP are higher under an "open" (S2b) than under an "exclusive" agreement (S2a): real GDP is projected to increase by 0.45% (S2a) and 0.54% (S2b), whereas real exports are projected to increase by 0.87% (S2a) and 1.07% (S2b). The open agreement scenario generates higher increases, since there would be larger trade cost reductions, i.e. vis-a-vis more trading partners.

Considering the projected changes across various regions, under S2a ("open" agreement) in all regions exports are projected to increase, except for six regions which would see exports fall marginally: Sub-Saharan Africa LDC (-0.54%), India (-0.33%), Asia LDC (-0.30%), South Africa (-0.28%), Mexico (-0.45%) and Canada (-0.11%). The first four countries (or some countries within the first four regions)

Table 5: Variations in real GDP by scenario (cumulative 2020-2050, in %)

Region	S1	S2a	S2b	S2c	S2d	S3a	S3b	Opportunity cost
Asia LDC	3.87	-0.05	-0.07	-0.06	-0.08	-6.32	2.47	10.19
Australia	1.77	0.16	0.17	0.76	0.83	-2.08	-1.40	3.85
Brazil	2.54	0.31	0.36	0.87	1.01	-2.10	-1.78	4.64
Canada	1.39	0.02	0.01	1.23	1.35	-1.06	-1.12	2.45
China	4.54	1.35	1.61	1.05	1.25	-9.66	-10.01	14.20
EU27	3.12	0.70	0.75	1.94	2.17	-3.89	-3.02	7.01
EFTA	3.67	0.48	0.51	2.00	2.25	-3.38	-2.66	7.05
UK	2.71	0.43	0.46	1.63	1.82	-4.06	-2.63	6.77
Indonesia	3.26	0.70	0.80	-0.04	0.00	-5.72	2.00	8.98
India	3.55	-0.07	-0.04	-0.01	-0.04	-4.17	1.49	7.72
Japan	1.79	0.23	0.25	1.01	1.15	-5.86	-4.50	7.65
Republic of Korea	5.07	0.58	0.69	1.82	2.10	-11.77	-10.62	16.84
Latin America	1.94	0.13	0.19	0.53	0.67	-1.59	-1.47	3.53
Mexico	2.12	0.05	0.05	0.49	0.59	0.71	-0.65	1.41
Middle East and North Africa	4.17	0.19	0.36	0.60	0.88	-7.90	-8.06	12.07
Other Asia countries	4.82	0.73	0.83	1.86	2.07	-7.62	-8.02	12.44
Russian Federation	2.87	0.69	0.78	1.32	1.52	-6.35	-6.61	9.22
Kingdom of Saudi Arabia	1.26	0.15	0.21	0.82	0.99	-3.27	-3.29	4.53
Southeast Asia	4.69	0.49	0.52	2.10	2.32	-10.74	5.77	15.43
Sub-Saharan Africa LDC	5.68	-0.11	-0.04	-0.10	0.03	-6.77	1.38	12.45
Sub-Saharan Africa other	2.77	0.15	0.22	0.94	1.14	-6.10	0.94	8.87
Türkiye	3.00	0.29	0.30	0.78	0.93	-3.85	-3.82	6.85
USA	0.97	0.06	0.06	0.49	0.57	-2.63	-1.79	3.60
South Africa	2.93	-0.04	0.09	-0.02	0.05	-6.39	0.91	9.32
Developped	2.43	0.32	0.36	1.23	1.39	-3.97	-3.48	6.40
Developing	3.56	0.69	0.84	1.10	1.36	-6.55	-3.11	10.11
LDCs	4.77	-0.08	-0.06	-0.08	-0.02	-6.54	1.92	11.31
Global	3.21	0.45	0.54	1.03	1.23	-5.44	-2.73	8.65

Note: S1: revival of multilateralim; S2a: "Exclusive" plurilateral agreement on E-commerce; S2b: "Open" plurilateral agreement on E-commerce; S2c: "Exclusive" plurilateral agreement on services; S2d: "Open" plurilateral agreement on services; S3a: full rivalry; S3b: partial rivalry . We do not report RoW as it serves as a residual when fixing the trade balance.

are not part of the plurilateral under Scenario 2a which explains the negative effect on trade because of the "exclusive" implementation of the plurilateral. Countries not participating will not see their trade costs faced on exports fall and thus will not benefit from export growth. India, South Africa, and Sub-Saharan Africa LDC particularly lose in exports of communication, finance, transport and trade services (Table A.4).[11]

Turning to the GDP effects, four regions are projected to face GDP losses: Sub-Saharan Africa LDC (-0.11%), India (-0.07%), Asia LDC (-0.05%) and South Africa (-0.04%), which is driven by their projected loss in real exports, because they are not benefiting from reductions in trade costs on their exports. All other regions report GDP gains, in particular China (1.35%). China had the highest STRI before the shock and thus reports the largest reductions in NTMs (Table 2).

Next, we compare the effects of the "exclusive" and "open" scenario. In some regions exports increase more in the "open" scenario, particularly the non-participants. For example, South Africa experiences a reduction in exports under an "exclusive" scenario (-0.28%), whereas it experiences an increase in exports under an "open" agreement (0.01%) (Table 4). In India and Sub-Saharan Africa LDC exports fall less under the "open" scenario as expected because these countries would benefit from reductions in trade costs exporting to plurilateral participants. However, in Asia LDC exports fall more under the "open" scenario, which is driven by a reduction in goods exports, in particular a reduction in exports of computer, electronic and optical equipment, and other goods (Table A.4). The reason is that Asia LDC faces more competition from other regions benefiting more from reductions in intermediate input costs and this channel dominates the channel of more export competitiveness. However, the differences in trade effects are marginal, i.e. -0.30% under the "exclusive" scenario and -0.37% under the "open" scenario.[12]

Turning to the GDP effects, when the plurilateral agreement is implemented on an MFN basis (S2b) most participants in the plurilateral agreement would benefit from larger GDP increases. Most non-participants tend to lose less and/or gain more. The projected reductions in GDP in India and Sub-Saharan Africa LDC are smaller while South Africa's projected loss in GDP would turn into a GDP gain. Asia LDC represents an exception, with higher losses under an "open" plurilateral agreement, which is due to a loss of competition of Asia LDC.[13] More generally, the simulations of the plurilateral scenarios show that countries can benefit from participating in the plurilateral agreement, since participants display

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[11] The situation is different for Canada and Mexico, who are projected to participate in the agreement on E-commerce and so would benefit from a reduction in trade costs when exporting. As a result their exports in all affected services sectors increase (Table A.4). However, this increase doesn't compensate their loss in goods exports, in particular in textile, apparel and leather and electrical equipment, which are driven by general equilibrium changes in competitiveness (real wages).

[12] Canada and Mexico are also projected to see slightly larger reductions in exports. Canada's global reduction in exports comes from reductions in all goods sectors and Mexico sees its exports of services, in particular utilities and construction increase (16.84%, Table A.4) thanks to the plurilateral agreement, but suffers from a loss in exports of electrical equipment, textile, apparel and leather, and computer, electronic and optical equipment.

[13] Interestingly, Asia LDC's GDP increases in this scenario from 2020 to 2036 before falling to reach -0.07% compared to the baseline in 2050. Since our model features a fixed trade balance and diffusion of ideas, regions such as Asia LDC that import less intermediates benefit less from spillover effects, which leads to a late reduction in GDP.

larger GDP gains than non-participants, even if the plurilateral is "open".

Under the plurilateral scenarios on services (S2c and S2d), gains in terms of real GDP are higher than those under the plurilateral agreement on E-commerce since the size of the sectors facing the reduced trade costs is larger than the size of E-commerce sectors. In the "exclusive" plurilateral agreement on services (S2c), five regions are projected to incur GDP losses: Sub-Saharan Africa LDC (-0.10%), Asia LDC (-0.06%), Indonesia (-0.04%), South Africa (-0.02%), and India (-0.01%). Like for the E-commerce Scenario this can be explained from the fact that these regions are not part of the agreement in the "exclusive" scenario on services.

Turning to exports, in S2c five regions suffer exports losses: Sub-Saharan Africa LDC (-0.50%), India (-0.23%), South Africa (-0.21%), Asia LDC (-0.19%), and Indonesia (-0.10%). These results mirror the results on real GDP, as these countries are not included in the agreement on services and the agreement is implemented on an "exclusive" basis. Global losses in exports originate from losses in services in these five regions ranging from -2.35% in Asia LDC to -4.21% in Indonesia (Table A.5).

If the plurilateral agreement is implemented on a MFN basis (S2d), most countries benefit from higher GDP gains, even non-participating countries. Two exceptions are worth noting, Asia LDC and India, whose real GDP are lower under S2d. Similar to the scenario on E-commerce, in these regions the benefits of having more market access in the "open" scenario are dominated by the fact that these regions incur competitiveness losses vis-a-vis participants because they benefit less from beneficial spillover effects of importing intermediate inputs.

Most countries benefit from an "open" agreement (S2d), even non-participating countries (Table 4). For example, Sub-Saharan LDC which is projected to suffer from a loss in exports under S2c (-0.50%) benefits from the "open" agreement (S2d) (0.31%) (Table 4). In India and South Africa, the "open" agreement leads to lower losses in exports. All three regions increase their exports in services by 6.77%, 4.28% and 5.85%, respectively (Table A.5). Once again, Asia LDC and Indonesia represent exceptions, with higher losses under S2d than S2c (Table 4).

The discussion of export and GDP results on plurilaterals generated three main findings. First, the regions participating in plurilaterals are projected to see real exports and real GDP increase, both under the "open" and "exclusive" plurilaterals. Second, non-participants tend to face reductions in real exports and GDP under "exclusive" plurilaterals, whereas their projected losses would become smaller and in many cases turn into gains when the plurilaterals become "open", meaning that increased market access of participants is also granted to non-participants. Third, comparing the results for participants and non-participants implies that countries would see their exports and GDP go up if they would decide to participate in the plurilaterals.

3.2   Structure of trade

3.2.1   Trade shares by region, sector and geopolitical block

We start with an analysis of the impact of the different trade policy scenarios on global trade shares of the different regions. Figure 1 displays the projected changes in the share of each region in global trade, measured in per cent. As expected the largest changes would occur for Scenarios 1 and 3, Revival of multilateralism and Geopolitical rivalry. Under the revival scenario Asia LDC and Brazil would display the highest increase in export shares (by about 16% and 17% respectively), whereas also Indonesia and Sub-Saharan Africa LDC would benefit from large increases. These regions would benefit from the largest reductions in trade costs faced for their exports, but would also be able to reallocate their resources more towards exports than other regions.

Figure 1: Variation in the share of regional exports in global trade - excluding intraregional trade (cumulative, 2020-2050)
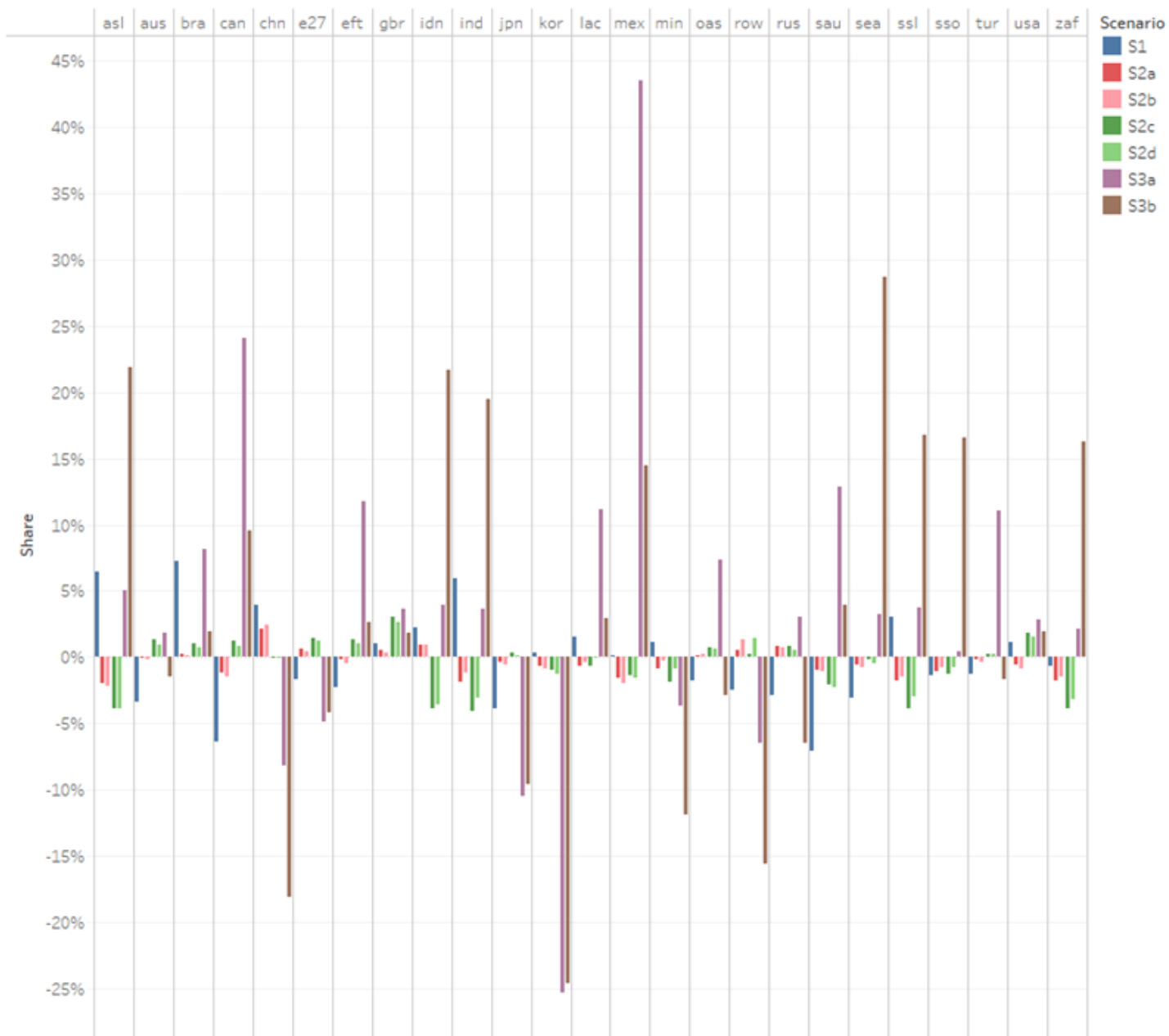
Under geopolitical rivalry there are also remarkable changes in trade shares of different regions. Whereas Mexico is projected to see its share in global trade increase by almost 25% under full rivarly (S3a), because of a strong shift in USA imports from the Eastern block towards Mexico, the Republic of Korea would face a reduction of about 35% of its share in global trade in this scenario. Being part of the Western block geopolitically but geographically located in the Eastern block, this country would suffer from a large drop in the share of its exports in global trade. Finally, China would also see its share in global trade shrink drastically (by more than 20%). Whereas Mexico would benefit much less under partial rivalry, because the USA would keep on importing more from regions not being part of one of the blocks, China would suffer a larger loss in the share of its exports in global exports, which is due to the fact that the regions moving to neutral from the Western block do not constitute a large share of their export market compared to other regions in Asia such as Japan and the Republic of Korea who would see their exports shrink by less under partial rivalry.

Finally, the changes in regional trade shares are an order of magnitude smaller under the plurilateral scenarios (S2) than the revival and rivalry scenarios.

Turning to shifts in the share of trade within and between geopolitical blocks displayed in Figure 2, the simulations project that multilateralism (S1) would increase trade between Western and Eastern blocks by 7 percentage points compared to the baseline in 2020 and by 1 percentage point compared to the baseline in 2050. On the contrary, full rivalry (S3a) would lead to a reduction of trade between blocks by 21 percentage points from 46% in the baseline in 2050 to 25% in the full rivalry scenario. As expected, trade within the Western block on one side and within the Eastern block on the other side would increase to 37% and 38%, respectively. If some developing regions and LDCs remain neutral (S3b), trade between blocks (defined in the same way as before) would only decreases to 34%.

3.2.2 Revealed comparative advantage

Table 6 reports revealed comparative advantage (RCA) for the three aggregation regions, developed economies, developing economies and LDCs in the four aggregate sectors agriculture, extraction, manufacturing and services. Three interesting results can be highlighted in the projected changes in RCA. First, with revival of multilateralism (S1) the RCA of LDCs in services is projected to increase whereas with geopolitical rivalry (S3a and S3b) the RCA of LDCs in services is projected to fall. A similar pattern can be observed for developing countries, whose RCA in services would fall under geopolitical rivalry (S3a and S3b). This indicates that multilateralism and preventing decoupling can help developing countries and especially LDCs to catch-up in services in which traditionally they have a comparative disadvantage, whereas services trade is expected to grow strongly in the future because of structural changes in the economy and digitalization.[14] Furthermore, services sectors such as IT services and telecommunications

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[14]Bekkers et al. (Forthcoming-a) expect the share of services in total trade to rise above 30% by 2050.

Figure 2: Trade within and between regions by scenario
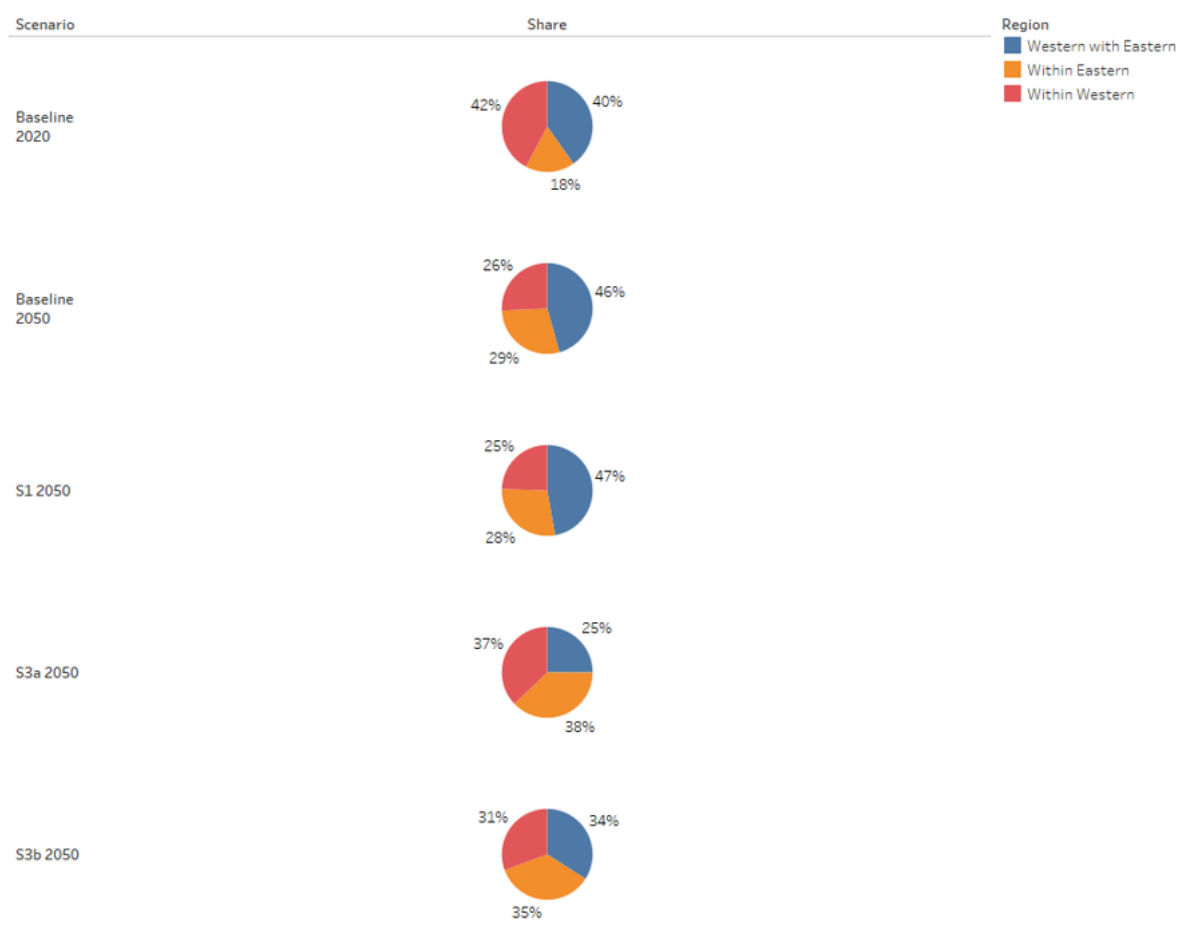
are expected to be the most dynamic sectors in the future.

Second, multilateralism can help LDCs to diversify away from agriculture and extraction shifting towards manufacturing and services. From a classical development perspective this should help their growth perspectives.[15] Third, "open" plurilateralism is projected to be important for LDCs to reduce their comparative disadvantage in services. In Scenarios S2b and S2d their RCA in services is projected to increase whereas it is projected fall in the "exclusive" scenarios (S2a and S2c).

Table 6: Revealed comparative advantage by aggregated region and aggregated sector (2050)

Sectors	Developed							
	Baseline	S1	S2a	S2b	S2c	S2d	S3a	S3b
Agriculture	0.79	0.66	0.78	0.78	0.77	0.78	0.96	0.90
Extraction	0.81	0.82	0.80	0.81	0.80	0.80	0.79	0.81
Manufacturing	0.79	0.77	0.78	0.78	0.77	0.78	0.80	0.72
Services	1.22	1.22	1.22	1.22	1.22	1.21	1.24	1.29
Sectors	Developing							
	Baseline	S1	S2a	S2b	S2c	S2d	S3a	S3b
Agriculture	1.16	1.27	1.17	1.16	1.18	1.17	1.00	1.05
Extraction	1.10	1.09	1.10	1.10	1.11	1.11	1.13	1.10
Manufacturing	1.19	1.19	1.19	1.19	1.20	1.19	1.18	1.23
Services	0.82	0.82	0.82	0.82	0.81	0.82	0.80	0.76
Sectors	LDC							
	Baseline	S1	S2a	S2b	S2c	S2d	S3a	S3b
Agriculture	1.74	1.66	1.77	1.76	1.81	1.77	1.61	1.80
Extraction	2.45	2.33	2.49	2.48	2.54	2.51	2.49	2.22
Manufacturing	1.35	1.38	1.37	1.36	1.40	1.36	1.31	1.38
Services	0.47	0.50	0.47	0.48	0.45	0.49	0.43	0.44

Note: S1: revival of multilateralim; S2a: "Exclusive" plurilateral agreement on E-commerce; S2b: "Open" plurilateral agreement on E-commerce; S2c: "Exclusive" plurilateral agreement on services; S2d: "Open" plurilateral agreement on services; S3a: full rivalry; S3b: partial rivalry.

3.2.3 Strength of intermediate linkages

Focusing on the impact of the different scenarios on global value chains, Figure A.1 reports the imported intermediate share in gross output by region and scenario. From Figure A.1, we can clearly see that two scenarios reinforce global value chains: revival of multilateralism and plurilateral agreements on services.

With enforced multilateral cooperation, the reinforcement of global value chains is mainly driven by increased shares of imported intermediate inputs in the gross output of services (from 6.15% to 6.69%) and to a lesser extent in the gross output of manufacturing (from 8.15% to 8.39%) (Figure 3). This is coherent with reduction in trade costs, which are on average larger for services than for goods.

Under plurilateral cooperation on services (in particular "open" cooperation), the increase in the share of imported intermediates in gross output is also driven by an increasing share of imported intermediate inputs in the gross output of services, in particular in communication services. This result isn't surprising

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[15]Dynamic spillover effects varying by sector and present high-tech sectors are not part of the model.

Figure 3: Global share of imported intermediate in gross output by aggregated sector and by scenario (2050)
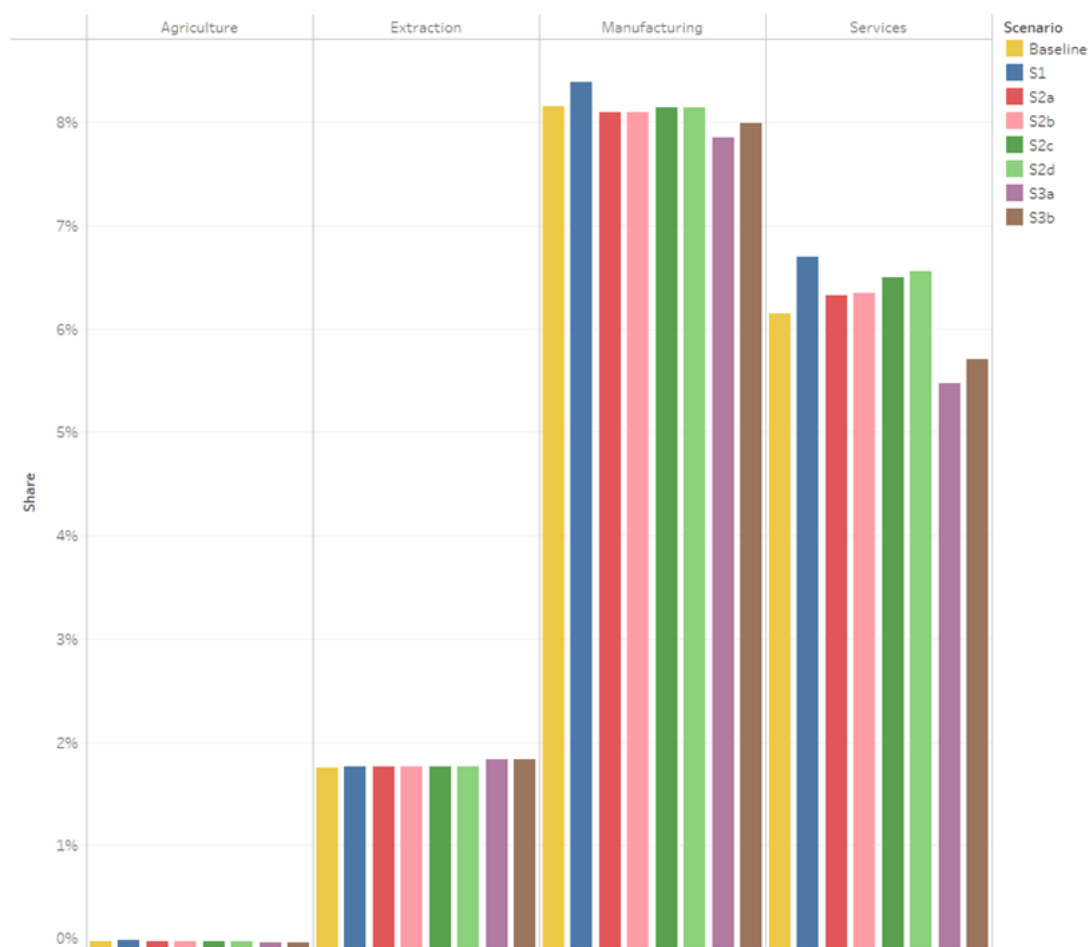
as countries reduce NTMs on services sectors, with the largest reduction in communication services (-7.05%) (Table 3).

On the other hand, shares of imported intermediate inputs in manufacturing and services decrease compared to the baseline in the geopolitical rivalry scenarios, as tariffs on manufactured goods and NTMs on services increase (Table 3).

To summarize, cooperation (either multilateral or plurilateral) will reinforce intermediate linkages in services sectors and to a lesser extent in manufacturing, whereas geopolitical rivalry would weaken intermediate linkages in services and to a lesser extent in manufacturing sectors.

4   Conclusion

The aim of this paper is to present the outcomes of different paths for future trade policy. We created three main scenarios, implemented using the WTO Global Trade Model: revival of multilateralism, plurilateral cooperation, and geopolitical rivalry.

We find that multilateralism is the most favorable outlook for all regions, in particular for developing countries and LDCs. Further advancements in multilateral cooperation would bring GDP gains to all nations, with the highest GDP gains materializing in developing economies and LDCs.

If multilateral agreements cannot be reached, plurilateral cooperation can benefit countries willing to negotiate on specific sectors. It would allow for positive advancement in trade relations without requiring unanimity. Plurilateral cooperation raises question about its implementation: "exclusive" versus "open" agreements. In our work we show that, on average, plurilateral cooperation would be the most beneficial if implemented on an MFN basis. Furthermore, we observe that the greater the number of countries and sectors considered in a plurilateral agreement, the larger the gains. As plurilateral agreements remain "open", other countries could join at their own pace, paving the way for a multilateral agreement. We find that participants gain more than non-participants suggesting that non-participants have an incentive to join the initiatives, even if they are "open".

Finally, geopolitical rivalry between a Western and an Eastern Block is the worst solution for almost all countries.[16] GDP losses would become substantial over time according to our simulations, especially for developing countries and LDCs, whose real GDP would fall by -7% in 2050. This negative effect could be reduced for all regions, and in particular for LDCs, if the latter remain outside of the conflict.

Overall, all nations could benefit from cooperating with one another. Cooperation could initially take the form of "open" plurilateral agreements which would evolve into multilateral agreements.

The analysis has three broad implications for the role of the WTO in the multilateral trading system. First, for the global economy there is a lot at stake with the opportunity costs of foregoing multilateralism

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[16]Mexico represents an exception as it reports a small GDP gain under the geopolitical rivalry scenario, which is explained by trade diversion effects.

and instead taking the route of geopolitical rivalry amounting to more than 8% of global GDP. This loss is much larger than the cumulative long-run loss in the OECD countries of the Great Financial Crisis. This shows that the WTO as institution is highly relevant for global real income levels. Abandoning trade policy focused on reaping mutually beneficial gains from trade with a multilateral trading system and exchanging it for a system guided by geopolitical security objectives would come with large costs. Second, keeping trade cooperation going in the WTO through plurilateral initiatives would generate output gains for both participants and most non-participants, in particular if the initiatives have an open character. Third, the WTO plays a particularly important role in guarding the interests of low-income regions by maintaining an open trade regime in place. Our simulations show that low-income regions would benefit most from further multilateralism and suffer most from geopolitical rivalry. Furthermore, the WTO has an important role to play to prevent that LDCs would have to choose blocs and would thus face increases in trade costs vis-a-vis regions in the two blocs. For these regions partial rivalry and thus remaining outside of the two blocs would make a large difference. The difference is about 8.5% real GDP with a projected loss of 6.5% under full rivalry and a projected GDP increase of about 2% under partial rivalry.

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A1 Technical implementation of the scenarios

This subsection provides additional information on the implementation of each scenario in our model.

1. Revival of multilateralism

   To model the revival of multilateralism, we start by reducing tariffs based on three elements.

   Firstly, we reduce tariffs that had been raised in the benchmark due to trade tensions between the USA, China and other trading partners, and associated retaliation and counter-retaliation.[17]

   Secondly, we decrease tariffs for all regions in proportion to their negative spillover effects onto other countries, following Bekkers and Keck (Forthcoming). The authors study spillover effects and demonstrate that (i) spillovers are proportional to tariff rates and so tariffs should be cut as a per cent of initial tariffs; (ii) richer regions generate larger spillover effects meaning poorer regions should reduce tariffs less; and (iii) tariffs should be reduced by a greater percentage for products with higher trade elasticity i.e. highly substitutable products.

   Thirdly, we assume multilateral agreements reduce uncertainty. Osnago et al. (2018) define uncertainty as the difference between binding tariff commitments under trade agreements and applied

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[17]In 2018, we include in the baseline model an increase in tariffs due to trade tensions between the USA, China and other trading partners. When implementing the multilateral scenario, starting in 2020, we start by reducing tariffs as we assume a reversal of these trade tensions.

tariffs - also known as "water". The authors empirically determine the impact of trade policy uncertainty on the extensive and intensive margins of trade for 65 exporters. Using this work, we construct ad valorem equivalents (AVEs) of reduced uncertainty for all goods sectors assuming that a multilateral agreement would reduce water to zero. Note that we assume a phase-in period for all tariffs of 15 years, following Baier and Bergstrand (2007).

Furthermore, we assume that a revival of multilateralism would reduce both trade costs of NTMs and the uncertainty about the level of NTMs.

To implement a reduction in NTMs, we first use their AVEs estimated by Kee and Nicita (2016) for goods and by Hoekman and Shepherd (2020) for services. Kee and Nicita (2016) use a gravity equation to estimate bilateral AVEs of 40 importing countries and the European Union for 42 sectors based on data from 2015.[18],[19] Hoekman and Shepherd (2020) also use a gravity framework to estimate AVEs for seven services sectors, based on the OECD Services Trade Restrictiveness Index (STRI) (OECD, 2021). When data is not available, we use linear extrapolation based on countries' income categories to estimate AVEs of missing observations. In this scenario, we implement a 25% reduction in NTMs.

Secondly, we consider the trade-enhancing effect of reduced uncertainty as a result of binding trade agreements. Ciuriak et al. (2020) empirically demonstrate the theoretical uncertainty-reducing effects of trade agreements on services trade. The authors use data on commitments made under the General Agreement on Trade in Services (GATS) and under Free Trade Agreements (FTAs) and compare them with actual regulations on services, from the OECD's Services Trade Restrictiveness Index (STRI). The difference between the STRI and the GTRI (i.e. GATS Trade Restrictiveness Index) or FTRI (FTA Trade Restrictiveness Index) is the "water", or the measure of uncertainty. The authors use this measure of uncertainty in a gravity model for services exports, featuring standard gravity variables, STRI and "water". [20] We use these estimates to compute AVEs of reduced uncertainty.[21] Finally, we phase-in all reductions in NTMs over 15 years.

2. Plurilateral cooperation

We develop four sub-scenarios of plurilateral cooperation.

In the first two sub-scenarios, a set of countries cooperate on E-commerce, exclusively or openly.

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[18]Since Kee and Nicita (2016) report AVEs for technical and non-technical barriers separately, we add both values of AVEs to obtain total AVEs.

[19]Kee and Nicita (2016) use GTAP 9 data base sector categories, which doesn't exactly include the same sectors as GTAP 10 data base. For example, "Minerals nec" now refers to "Other Extraction". Moreover, "Chemical, rubber, plastic products" is now divided into two sectors: "Chemical products" and "Rubber and plastic products". In this latter case, we assume AVEs obtained in Kee and Nicita (2016) for "Chemical, rubber, plastics products" apply to both "Chemical products" and "Rubber and plastic products" sectors.

[20]They find that reduced uncertainty stemming from binding agreements increase services trade by 4.7%.

[21]We account for reduced water in goods sectors by reducing tariffs whereas we consider the effect of reduced water for services sectors by reducing NTMs. This raises the question of whether there could be water for NTMs in goods. As previously mentioned, water is the difference between commitments under binding agreements and actual regulation. We would therefore need data on countries' commitments regarding NTMs on goods to consider water for NTMs in goods.

To implement these sub-scenarios in the model, we use the empirical work of Benz and Jaax (2020). The authors estimate the impact of services restrictiveness regulation (i.e. STRI) on trade flows using a gravity equation. We therefore compute AVEs of changes in STRI scores based on Benz and Jaax (2020)'s estimates.[22] Changes in STRI scores reflect the expected impact of new regulations implemented by countries participating in the plurilateral agreement on E-commerce.

The OECD STRI reports data for 48 countries and 22 services sectors. We mapped these 22 services sectors into 10 GTAP sectors: air transport, water transport, transport nec, communication, business services nec, trade, financial services nec, insurance, construction, and warehousing and support activities. These GTAP sectors are then aggregated in our model into 6 services sectors: transport, communication, finance, other business services, trade, utilities.[23] When data is missing, we extrapolate STRI values based on income categories. This implies that the results for individual countries without STRI data should be interpreted with caution.

In the next two sub-scenarios, we assume that a set of countries cooperate to liberalize trade in services, either exclusively or openly. We model this plurilateral agreement through a 25% reduction in AVEs of NTMs for services, based on Hoekman and Shepherd (2020). We further reduce trade costs by considering reduced uncertainty following Ciuriak et al. (2020), as in previous scenarios. Finally, we phase-in all shocks on iceberg trade costs over 15 years, based on Baier and Bergstrand (2007).

We use the Joint Statement Initiatives (JSIs) to create subsets of countries that enter our plurilateral agreements. [24,25] We do not, however, intend to model the outcome of these ongoing negotiations.

3. Geopolitical rivalry

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[22] Benz and Jaax (2020) aggregate OECD sectors into five larger services sectors (business, insurance, finance, transport, and communication). We use Benz and Jaax (2020)'s estimated trade elasticity of transport for our three sectors related to transport (air transport, water transport, and other transport). Furthermore, we use the average of the gravity coefficient on STRI score estimated by Benz and Jaax (2020) for the three missing sectors.

[23] We couldn't map three sectors from the OECD STRI: logistics cargo-handling, logistics freight forwarding, and logistics customs brokerage. Our data therefore do not cover these three sectors.

[24] As of January 2022, there are 67 WTO members participating on the JSI on services domestic regulation: Albania; Argentina; Australia; Austria; Bahrain, Kingdom of; Belgium; Brazil; Bulgaria; Canada; Chile; China; Colombia; Costa Rica; Croatia; Cyprus; Czech Republic; Denmark; El Salvador; Estonia; European Union; Finland; France; Germany; Greece; Hong Kong China; Hungary; Iceland; Ireland; Israel; Italy; Japan; Kazakhstan; Republic of Korea; Latvia; Liechtenstein; Lithuania; Luxembourg; Malta; Mauritius; Mexico; Moldova, Republic of; Montenegro; Netherlands; New Zealand; Nigeria; North Macedonia; Norway; Paraguay; Peru; Philippines; Poland; Portugal; Romania; Russian Federation; Kingdom of Saudi Arabia; Singapore; Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Chinese Taipei; Thailand; Türkiye; Ukraine; United Kingdom; United States of America; Uruguay.

[25] As of January 2022, there are 86 WTO members participating in the JSI on E-commerce: Albania, Argentina, Australia, Austria, Bahrain, Kingdom of, Belgium, Benin, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Cameroon, Canada, Chile, China, Colombia, Costa Rica, Côte d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, El Salvador, Estonia, Finland, France, Georgia, Germany, Greece, Guatemala, Honduras, Hong Kong China, Hungary, Iceland, Indonesia, Ireland, Israel, Italy, Japan, Kazakhstan, Kenya, Republic of Korea, the State of Kuwait, Lao People's Democratic Republic, Latvia, Liechtenstein, Lithuania, Luxembourg, Malaysia, Malta, Mexico, Moldova, Republic of, Mongolia, Montenegro, Myanmar, Netherlands, New Zealand, Nicaragua, Nigeria, North Macedonia, Norway, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Kingdom of Saudi Arabia, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Chinese Taipei, Thailand, Türkiye, Ukraine, United Arab Emirates, United Kingdom, United States of America, and Uruguay.

In these last scenarios, we model a bipolar world centered around the USA on one side and China on the other.

To do so, we use measures of foreign policy similarity (FPSIM Version 2) based on alliances and UN General Assembly voting data (Häge, 2017). We compute a simple average of the 14 different measures included in the dataset and a simple average of S-score, π-score and K-score. These latter scores focus on UN General Assembly voting.[26] Results obtained using different measures are similar and allow us to distinguish different geopolitical blocks, described in Tables A.2 and A.3. Under partial rivalry, seven regions remain outside of the conflict and therefore do not face rising trade costs: Asia LDC, India, Indonesia, South Africa, Southeast Asia, Sub-Saharan Africa LDC, and Sub-Saharan Africa Other. Otherwise, the same methodology (described below) is used to model both full and partial rivalry.

We reflect the breakdown of international cooperation by an increase in both tariffs and NTMs between countries that do not belong to the same block.

To implement these shocks, we first start by reducing tariffs that had been raised in the baseline and accounted for trade tensions between the USA, China and other trading partners. We reduce these tariffs for countries belonging to the same block accordingly.

Secondly, we raise tariffs between countries belonging to separated blocks to their non-cooperative (trade war) level based on Bekkers and Teh (2019). The authors use estimates on the difference between cooperative and non-cooperative tariffs from Nicita et al. (2018) to determine the size of the tariff increase.

Thirdly, we use the work of Larch et al. (2019) to estimate the AVEs of international cooperation breakdown and then raise NTMs. The authors use a gravity model of exports, featuring standard gravity variables and dummies representing GATT/WTO membership. Since this study does not consider services, we extrapolate estimated effects of GATT/WTO membership on goods trade to effects on services trade. The authors find GATT/WTO membership increases bilateral trade flows by 88% between country pairs in which one country is not a member, and by 171% between two member countries. Where their study determines the impact of joining the WTO on trade, we are interested in the opposite phenomenon. We compute AVEs based on estimates from Larch et al. (2019), but reverse their effect since we model geopolitical rivalry. Finally, we phase-in these shocks over 15 years.

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[26]S-score of Signorino and Ritter (1999) equals one minus the sum of the squared actual deviation between a pair of countries' votes scaled by the sum of the squared maximum possible deviation between their votes. The π score estimates the frequency of agreement using the average of the two countries marginal distribution of votes. The K-score estimates the frequency of agreement using each country's own individual marginal distribution of votes.

A2 Additional results and tables

Table A.1: Regions and sectors

	Region	Region description	Sector	Sector description
1	asl	Asia LDC	ars	Accommodation and recreation
2	aus	Australia	chm	Chemicals
3	bra	Brazil	com	Communication
4	can	Canada	cro	Crops
5	chn	China	eeq	Computer, electronic and optic
6	e27	European Union	ele	Electrical Equipment
7	gbr	United Kingdom	fin	Finance and Insurance
8	eft	EFTA	lvs	Livestock
9	idn	Indonesia	met	Metals
10	ind	India	mvh	Motor vehicles
11	jpn	Japan	obs	Business Services
12	kor	Republic of Korea	oil	Oil
13	lac	Latin America	ome	Machinery and equipment
14	mex	Mexico	onr	Other extraction
15	min	Middle East and North Africa	otg	Other Goods
16	oas	Other Asian countries	otn	Transport equipment nec
17	row	Rest of World	ots	Other Services
18	rus	Russian Federation	p_c	Petroleum, coal products
19	sau	Kingdom of Saudi Arabia	prf	Processed Food
20	sea	Southeast Asia	prp	Pharma, rubber, and plastics
21	ssl	Sub-Saharan Africa LDC	rsa	Real estate activities
22	sso	Sub-Saharan Africa other	tra	Transport
23	tur	Türkiye	trd	Trade
24	usa	United States of America	twl	Textiles, apparel, leather
25	zaf	South Africa	utc	Utilities and Construction

Table A.2: Geopolitical blocks - S3a Full rivalry

Western block	Eastern block
USA	China
Australia	Asia LDC
Brazil	India
Canada	Indonesia
EFTA	Middle East and North Africa
EU27	Other Asian countries
Japan	Rest of World
Republic of Korea	Russian Federation
Latin America	Kingdom of Saudi Arabia
Mexico	South Africa
Türkiye	Southeast Asia
United Kingdom	Sub-Saharan Africa LDC
	Sub-Saharan Africa other

Table A.3: Geopolitical blocks - S3b Partial rivalry

Western block	Eastern block	Neutral
USA	China	Asia LDC
Australia	Middle East and North Africa	India
Brazil	Other Asian countries	Indonesia
Canada	Rest of World	South Africa
EFTA	Russian Federation	Southeast Asia
EU27	Kingdom of Saudi Arabia	Sub-Saharan Africa LDC
Japan		Sub-Saharan Africa other
Republic of Korea		
Latin America		
Mexico		
Türkiye		
United Kingdom		

Table A.4: "Exclusive" vs "open" plurilateral agreement on E-commerce: variations in exports by affected sectors (cumulative 2020-2050, in %)

Region	"Exclusive"						"Open"					
	com	fin	obs	tra	trd	utc	com	fin	obs	tra	trd	utc
Asia LDC	0.79	0.57	3.28	0.66	2.01	2.67	6.34	4.54	4.54	3.75	9.54	3.03
Australia	5.99	5.01	2.73	3.64	6.97	2.44	5.59	4.04	2.68	2.83	6.68	2.49
Brazil	6.27	5.22	2.97	3.90	8.31	6.62	6.25	4.73	3.06	3.31	8.13	7.26
Canada	3.87	1.79	1.78	1.49	5.20	0.92	3.32	0.95	1.66	0.99	4.96	1.03
China	8.57	9.35	6.39	5.28	9.69	13.48	9.30	10.78	7.18	5.62	10.35	14.45
EU	5.75	4.26	1.80	1.64	8.23	10.75	5.57	3.83	1.92	1.42	7.96	10.99
EFTA	5.85	3.97	2.23	2.65	8.98	2.12	5.56	3.52	2.34	2.34	8.59	2.26
UK	4.86	4.75	1.96	0.96	5.94	12.22	4.63	4.48	2.02	0.84	5.93	12.49
Indonesia	8.56	10.42	6.39	5.51	10.01	19.81	8.52	10.78	7.20	4.86	10.51	20.27
India	-1.76	-7.20	0.51	-1.58	-5.06	1.57	4.01	-0.63	2.07	3.44	7.32	19.24
Japan	5.20	3.90	2.84	0.99	9.98	27.01	5.08	3.58	3.00	0.94	9.50	27.18
Republic of Korea	5.91	4.27	2.05	1.28	10.15	25.52	5.57	3.83	1.88	1.35	9.80	25.36
Latin America	2.92	-0.66	1.76	1.33	2.94	0.97	4.65	3.37	2.46	2.66	6.51	3.94
Mexico	5.20	2.42	2.28	5.96	5.66	16.71	4.82	1.16	2.40	5.12	5.71	16.84
Middle east and North Africa	1.41	0.80	1.50	-0.89	1.80	3.66	4.38	5.08	2.23	2.62	5.63	6.89
Other Asian countries	3.26	3.52	1.66	0.41	7.44	5.12	5.45	3.96	1.48	2.90	7.52	5.54
Russian Federation	5.40	3.95	2.13	2.72	5.59	12.09	5.09	3.53	2.19	2.14	5.70	12.31
Kingdom of Saudi Arabia	5.30	7.50	2.41	5.48	6.16	4.68	5.06	7.14	2.53	4.42	6.02	4.21
Southeast Asia	6.37	5.20	3.33	3.54	10.23	11.81	6.89	5.05	3.51	3.15	10.19	12.05
Sub-Saharan Africa LDC	-1.84	-3.78	0.07	-2.06	-2.21	1.17	4.95	4.21	3.34	2.62	6.37	2.62
Sub-Saharan Africa other	2.95	-2.55	1.35	0.17	0.41	2.60	5.91	3.38	3.67	2.79	7.29	5.17
Türkiye	6.49	4.78	1.97	5.11	7.24	11.98	6.37	3.86	2.47	4.23	7.25	12.35
USA	4.22	4.14	1.75	2.69	4.71	6.57	3.62	3.19	1.60	1.97	4.57	6.51
South Africa	-1.92	-5.85	0.17	-2.85	-5.56	1.05	5.64	2.30	3.06	4.20	8.03	1.24
Developed	5.23	4.18	2.18	2.68	7.05	11.00	4.90	3.57	2.20	2.21	6.86	11.06
Developing	3.86	1.99	2.55	1.93	4.52	6.98	6.21	4.97	3.56	3.70	8.24	9.75
LDC	-0.52	-1.60	1.68	-0.70	-0.10	1.92	5.64	4.38	3.94	3.18	7.96	2.67
Global	4.11	2.67	2.32	2.05	5.27	8.35	5.59	4.31	2.99	3.01	7.61	9.76

Table A.5: "Exclusive" vs "open" plurilateral agreement on services: variation in exports by aggregated sectors (cumulative 2020-2050, in %)

Region	"Exclusive"				"Open"			
	Agriculture	Extraction	Manufacturing	Services	Agriculture	Extraction	Manufacturing	Services
Asia LDC	0.89	0.84	0.12	-2.35	0.84	-0.11	-1.87	9.00
Australia	-1.41	0.22	-1.89	8.32	-0.32	1.08	-0.70	8.38
Brazil	1.06	1.34	0.50	8.35	2.62	2.01	1.72	8.53
Canada	1.77	0.20	0.53	10.55	3.01	1.17	1.52	10.53
China	2.69	1.13	1.61	10.11	3.98	1.36	2.52	10.15
EU	0.72	0.13	0.27	7.51	2.06	1.66	1.76	7.73
EFTA	1.07	-0.03	-0.31	8.20	2.07	0.82	1.07	8.37
UK	0.59	0.44	-0.22	8.36	2.69	2.06	1.36	8.82
Indonesia	1.84	1.75	0.94	-4.21	0.18	0.29	-2.11	7.71
India	2.77	0.99	1.29	-2.69	-1.56	-0.40	-2.83	4.28
Japan	3.81	0.71	1.57	9.67	5.71	0.96	2.44	9.93
Republic of Korea	2.18	1.13	1.92	8.30	4.30	1.44	2.57	8.24
Latin America	1.16	0.62	0.56	4.64	0.37	0.29	-0.53	7.22
Mexico	1.49	0.90	0.55	10.63	2.18	1.85	1.32	10.78
Middle East and North Africa	1.05	0.36	0.26	2.68	-1.33	-0.37	-2.30	6.51
Other Asian countries	-0.22	0.13	-1.24	7.21	-0.28	0.37	-1.43	8.26
Russian Federation	-0.66	0.11	-0.32	7.48	0.99	1.35	0.86	7.41
Kingdom of Saudi Arabia	1.58	0.92	0.70	11.27	3.81	1.19	1.13	10.68
Southeast Asia	0.61	0.03	0.65	8.40	0.63	0.40	0.71	9.54
Sub-Saharan Africa LDC	1.39	0.37	0.27	-2.61	-0.90	-0.31	-2.48	6.77
Sub-Saharan Africa other	3.07	0.73	2.19	4.06	1.79	0.58	1.62	9.04
Türkiye	-0.23	0.09	0.43	8.81	3.04	0.47	2.44	9.11
USA	1.69	-0.84	-2.45	6.85	-0.47	-0.17	-1.39	7.34
South Africa	1.71	0.79	1.02	-2.93	-1.37	-0.67	-3.12	5.85
Developed	0.46	0.55	0.37	7.72	1.78	1.23	1.50	8.00
Developing	1.44	0.69	0.91	6.09	0.95	0.36	0.58	8.31
LDC	1.31	0.38	0.22	-2.55	-0.60	-0.31	-2.20	7.23
Global	1.06	0.55	0.43	5.74	1.24	0.71	0.19	8.43

Figure A.1: Share of imported intermediate in gross output by region and by scenario (2050)