

The impact on developing economies of WTO dissolution

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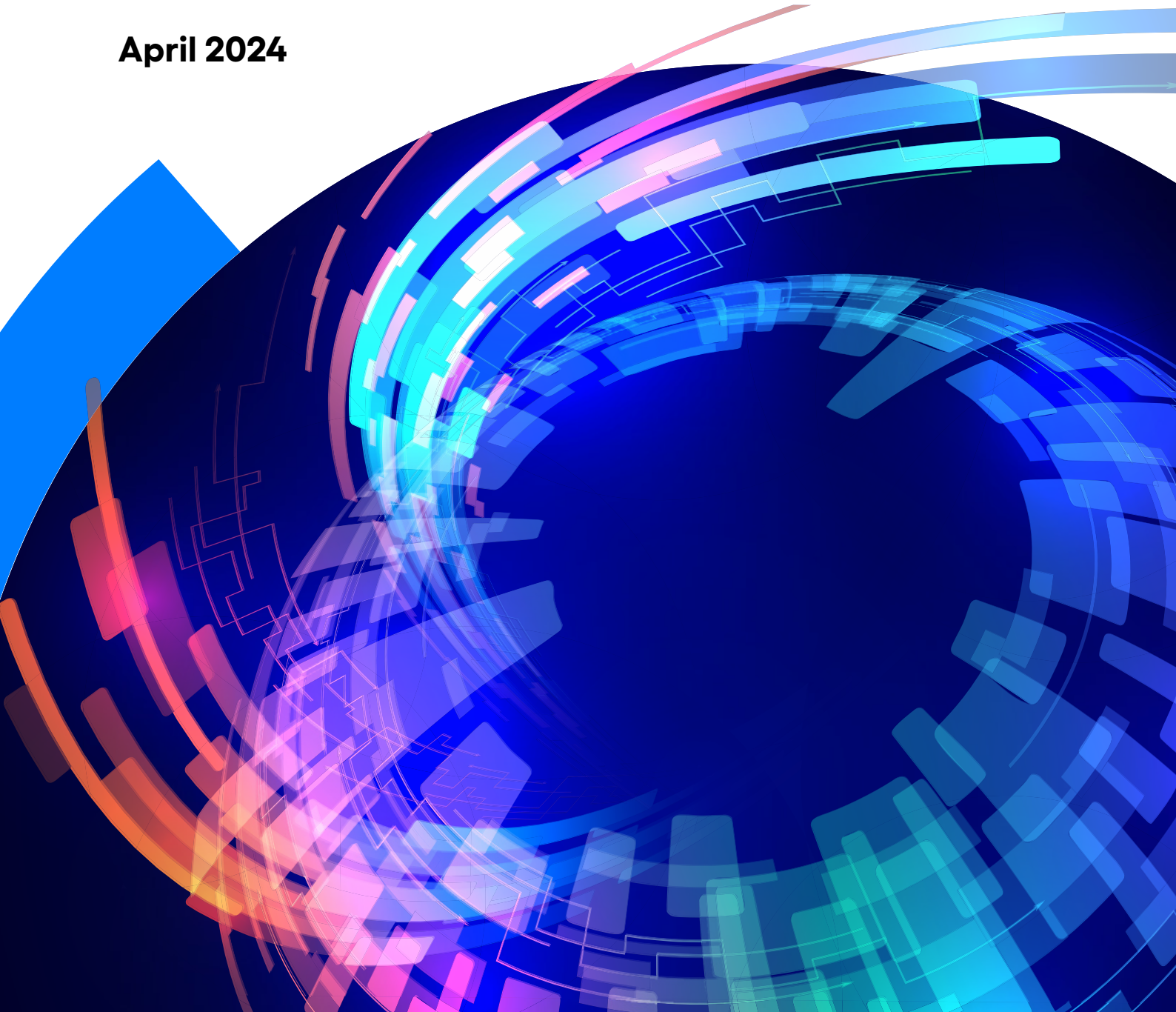




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Executive Summary

Oxford Economics have been commissioned by the International Chamber of Commerce (ICC) to provide an independent assessment of the potential impact of WTO dissolution on developing economies (middle-income and low-income countries). This report details our findings and the assumptions underpinning our analysis.

Scenario definition

A number of scenarios could be envisaged that would result in the abandonment of the rules-based multilateral trading system and WTO dissolution. All would entail negative repercussions for global trade, but the level of severity varies considerably depending on the specific assumptions employed. For example, a severe but plausible scenario could involve a global trade war resulting in policy-driven geoeconomic fragmentation; at the opposite end of the spectrum, a less extreme scenario for WTO dissolution could involve a more gradual erosion of trust eventually resulting in a breakdown of members' commitments to the rules-based system. We have taken a conservative approach to demonstrate our hypothesis that even a "best case" scenario for WTO dissolution would have substantial negative repercussions for developing economies that rely on trade as a critical enabler of growth.

In our scenario, the demise of the rules-based multilateral trading system results in greater uncertainty and higher information costs for all countries. Increased levels of protectionism may also be anticipated between country pairs without pre-existing free trade agreements (FTAs) in place. But this does not imply that all the benefits associated with the WTO would be destroyed – the world is now so closely integrated through global value chains (GVCs) that incentives to adopt protectionist policies are permanently reduced. Rather, we anticipate levels of protectionist policy between country pairs without FTAs would depend on levels of GVC integration.

The direct trade impacts of WTO dissolution in this scenario are limited to non-fuel goods. We assume most countries that are reliant on fuel imports would not wish to raise trade barriers affecting these inflows¹; meanwhile, policy commitments under the WTO to reduce barriers to trade in services are very limited – most studies find the WTO has no significant impact on services trade flows outside the telecommunications sector (for which the benefits associated with the WTO are unlikely to be rolled back following dissolution as developing countries would continue to push their digitalisation agenda to ensure competitiveness)².

The focus of our analysis is on the potential long-term structural impacts of WTO dissolution on developing economies. This is reflected in the presentation of the results, with metrics reported in terms of how they compare to our baseline ("status quo" with the WTO) forecasts for 2030. Our expectation is that the impacts of WTO dissolution would gradually intensify over time, with the full impact peaking by 2030 and remaining permanent.

¹ Some governments have imposed export or import restrictions on these products, often for geoeconomic reasons, but we assume this outcome is less likely under the "conservative" assumptions of our scenario.

² Although some recent studies have indicated a positive significant impact of WTO commitments on services trade, our focus on developing economies also makes it less relevant in the context of this study.

Modelling approach

In the long-term, the impact of WTO dissolution on the economy will be determined by the extent to which it affects supply-side capacity. This is a function of the supply of labour, the size of the capital stock and economy-wide productivity levels. Key channels of impact (trade and FDI) directly affect different components of demand, determining short-run changes in GDP, and different components of supply, which determine the long-run level of GDP that we present in our results.

We used theoretical and empirical evidence from academic literature to calibrate 'input' assumptions associated with WTO dissolution that could be used with the Oxford Economics Global Economic Model to determine the ultimate impact on long-term output.

Trade impact on developing countries

We estimate that WTO dissolution would lower exports of developing countries by around a third, comparing to a baseline where the "status quo" of the rules-based multilateral trading system remains intact. Within this group, low-income countries would be worst affected, with exports reduced by around 43% by 2030 (also compared to this baseline), while exports of middle-income countries would be lowered by around 32% by 2030.

This reduction in trade volumes stems from more restrictive government policies as well as an increase in trade barriers linked to higher information costs and uncertainty.

The substantial hit to exports of developing countries also reflects three key factors:

1. For developing countries, the WTO currently provides access to new markets with larger and more developed economies, opening up significant opportunities for export growth and diversification. Many of these benefits would be lost following WTO dissolution.
2. Least Developed Countries (LDCs) also currently benefit from preferential treatment (including duty-free and quote-free access to markets in some developed countries) and additional support from the WTO, such as technical advisory and capacity-building interventions.
3. Exporters in developing countries often stand to benefit more from the public goods provided by the WTO (such as setting norms, harmonisation of trade procedures and statistics, and producing knowledge products) as they are typically relatively small and the lumpy of cost of acquiring information is comparatively large.

-33%

Reduction in developing countries' non-fuel trade relative to baseline in 2030



GDP impact on developing countries

In the long run, the impact of reduced trade intensity on GDP operates by lowering investment and productive efficiency. The scale of this feed-through will depend on the current openness (share of trade in GDP) of each economy.

Our estimates suggest that WTO dissolution would lower GDP for developing countries as a group by 5.1% by 2030, relative to the “status quo” baseline.

As the world fragments, this would slow the process of trade-led convergence that has already enabled many developing economies to narrow the income gap with developed nations. This also has negative implications for producers in developed countries as it lowers access to suppliers and so reduces global supply chain resilience – this could in turn expose developed countries to increased volatility during crisis periods. And while we do not explicitly model the impact on international migration, the added economic hardship induced by WTO dissolution has the potential to further fuel economic-driven emigration, especially in low-income countries.

-5.1%

**Potential GDP loss to
developing countries
in 2030**



1. Introduction

The WTO continues to underpin global trade flows

The World Trade Organization (WTO) is the cornerstone of the global trading system. As stated on its website³, “the overall objective of the WTO is to help its members use trade as a means to raise living standards, create jobs and improve people’s lives.” This objective is to be achieved through the use of binding, non-discriminatory rules that remove trade barriers between its 164 member states. It is estimated⁴ that over 75% of global non-fuel goods trade occurs on the WTO’s most-favoured-nation (MFN) terms, highlighting the continued relevance of its members’ commitments. For business, as the ultimate end-user of the trading system, there is no alternative to the multilateral trading system, and it continues to attach great importance to the WTO’s effective functioning.

The WTO is especially important for developing economies, as it helps build their trade capacity. Strong growth in developing countries is needed to reduce poverty, and trade is a critical enabler of growth.

But the organisation is facing significant challenges

But a shifting international economic and geopolitical environment has raised a number of challenges for the organisation in recent years. It has also faced internal challenges, including the breakdown of the WTO’s dispute settlement system. The WTO’s rulebook also needs to be updated to deal more effectively with today’s trading environment. In order for the WTO to remain relevant in the future, new rules are required for dealing with digital trade and e-commerce, and it is argued that the WTO should play a larger role in addressing other global issues related to trade, such as food security and climate change.

Member states are struggling to reach consensus

Despite the clear need for reform and active discussions underway at the WTO, member states have yet to reach multilateral consensus on comprehensive reform of all three vital functions of the organisation – negotiation, dispute settlement, and monitoring and deliberation. At the WTO’s 13th ministerial conference in February 2023, ministers recommitted to having a full and well-functioning dispute settlement system for all Members by 2024. A lack of progress could further erode trust in members’ commitments to the rules-based system, which has been pivotal in enabling and protecting trade flows. With the future of the WTO now under discussion, it is important that its members understand what is at stake.

This study quantifies the potential impact of WTO dissolution

There is clearly a pressing need for a comprehensive, independent assessment of the potential consequences of abandoning the rules-based multilateral trading system. Oxford Economics have therefore been commissioned by the International Chamber of Commerce (ICC) to provide such an analysis, focussing on developing economies which are most at risk. The study quantifies and sheds light on how a world without the WTO would be detrimental for long-term development prospects for the world’s poorest countries.

³ www.wto.org/english/thewto_e/whatis_e/who_we_are_e.htm

⁴ As noted by Director General Okonjo-Iweala: www.wto.org/english/news_e/spno_e/spno10_e.htm

This report details our findings and the assumptions underpinning our analysis. It is structured as follows:

- **Section 2** presents an overview of the key modelling assumptions, including scenario design and modelling approach.
- **Section 3** discusses the results of our analysis, including key transmission channels.
- More detailed methodological notes are contained in **Appendix I**, with **Appendix II** providing a bibliography.

2. Modelling assumptions

WTO dissolution could feature in a variety of scenarios

A number of scenarios could be envisaged that would result in the abandonment of the rules-based multilateral trading system and WTO dissolution. All would entail negative repercussions for global trade, but the level of severity varies considerably depending on the specific assumptions employed.

For example, a severe but plausible scenario involving WTO dissolution would be a global trade war that results in policy-driven geoeconomic fragmentation. Such a scenario could unfold from trade disputes between China and the United States/European Union, with other countries then drawn into the disputes and forced to choose sides. Initially, these conflicts would likely be narrowly focussed on tech-related trade but could then broaden to encompass all goods and services as the disputes intensify. Eventually this could result in a fragmented international economic system characterised by the world split into a China-led bloc and a US-led bloc. The potential economic ramifications of a policy-driven reversal of global economic integration have been studied in a number of recent papers, as summarised in IMF (2003).

Rather than add to this existing literature, we consider a less extreme scenario for WTO dissolution involving a more gradual erosion of trust that eventually results in a breakdown of members' commitments to the rules-based system. We have taken this conservative approach to demonstrate our hypothesis that even a "best case" scenario for WTO dissolution would have substantial negative repercussions for developing economies.

A world without the WTO would be far less predictable for trade

In our scenario, the predictability of the trading environment would still be undermined. This lack of certainty over the future direction of trade policies would be the single largest challenge for businesses. This applies not only to tariffs, but also to other limits to legislative and regulatory options currently imposed by the WTO to prevent members from discriminating against foreign competitor products. With an escalation of protectionist measures likely across the world, nations that are currently part of established trade pacts would be better placed to weather the storm than those outside of these agreements.

In this environment, power politics in trade relationships could emerge to the detriment of smaller, less powerful nations. But even the largest players would find the trade environment – outside of their regional trade blocs – far less certain as disputes become more commonplace.

2.1 Scenario definition

WTO dissolution does not imply that all WTO-related benefits are destroyed

The influence of the WTO on information costs and uncertainty is consistent with findings that the WTO plays an important role in setting norms and precedents for global trade, as well as increasing policy transparency, such that both member and non-members receive benefits. For example, the WTO publishes trade policy review reports and online databases for all its members, providing access to this information on a non-discriminatory basis – the resulting benefits therefore do not accrue only to members, making the WTO a public good.

Increased levels of protectionism may also be anticipated, at least for country pairs without pre-existing trade agreements in place. That said, this scenario does not imply that all the benefits associated with the WTO would be destroyed – the world is now so closely integrated through global value chains (GVCs) that incentives to adopt protectionist policies have been reduced. Hence, the impact of WTO dissolution should not be viewed as merely the mirror-image of the positive benefits of WTO membership.

Reflecting these considerations, we constructed a scenario with the following key assumptions:

- For all country pairs, we apply additional trade costs associated with higher uncertainty and information frictions.
- Government-imposed trade restrictions (both tariffs and non-tariff barriers to trade) between countries that do not have an existing trade agreement in place are set at levels that strike a balance between protecting domestic-oriented industries and ensuring the competitiveness of export industries (linked to the extent of their integration through cross-border value chains).
- We assume that direct trade impacts of WTO dissolution are limited to non-fuel goods, i.e. trade in fuels and services are not directly affected in this scenario. For fossil fuels, applied tariffs are generally very low and we assume most countries that are reliant on fuel imports would wish to maintain this status quo so as not to obstruct inflows; meanwhile, policy commitments under the WTO to reduce barriers to trade in services are very limited and most empirical studies find no impact of WTO membership on services trade flows outside the telecommunications sector (for which the benefits associated with the WTO are unlikely to be rolled back following dissolution as developing countries would continue to push their digitalisation agenda to ensure competitiveness) ⁵.
- The full economic impacts of WTO dissolution play out over several years, as governments and multinationals gradually adapt to the new trading environment. As such, our estimates of the economic impact of WTO dissolution do not represent a “cliff edge” effect, with the full negative impact occurring the day the WTO is dissolved. Rather, we would see these impacts gradually intensifying, with the full impact peaking after around five years and remaining permanent.

The focus of our analysis is on the potential long-term structural impacts of WTO dissolution on developing countries. This is reflected in the presentation of the results, with metrics reported in terms of how they compare to our baseline (“status quo” with the WTO) forecasts for 2030. Although we only report results for developing economies (middle-income and low-income countries), the scenario was constructed within a global framework with consistent assumptions applied across all economies, including high-income countries. Outcomes are therefore fully reflective of the full range of global interactions.

⁵ For example, Hoekman (2009) finds that the General Agreement on Trade in Services (GATS) has led to a minimal impact on services trade flows. Although some more recent studies have indicated a positive significant impact of WTO commitments on services trade, our focus on developing economies also makes it less relevant in the context of this study.

2.2 Modelling approach

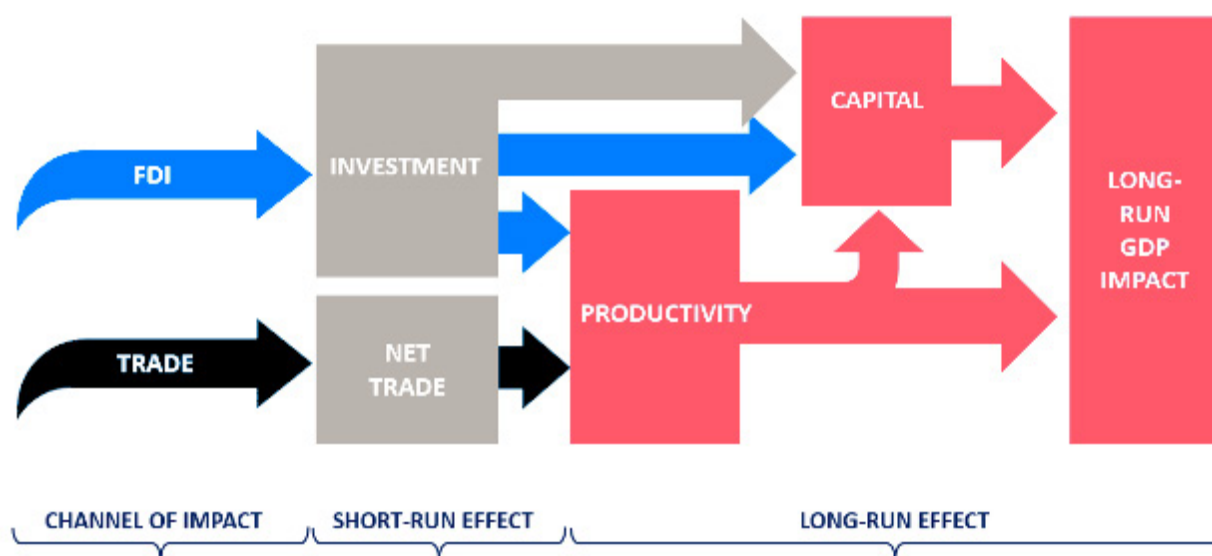
We focus on the long-run, structural impacts of WTO dissolution

We have modelled the impact of WTO dissolution across a sample of close to 200 individual countries. Results were then aggregated by region and income level for presentation in this report.

The starting point for our analysis is the current estimated positive influence of the WTO on trade volumes at the country pair level⁶. We decomposed these gains to understand the contributions of three transmission channels where cost savings are influenced by the WTO – trade policy (both tariffs and non-tariff barriers to trade), information costs and uncertainty. The increase in overall trade costs associated with WTO dissolution was then calibrated for each country based on the scenario assumptions relating to these transmission mechanisms set out in Section 2.1.

Over the long run, the impact of WTO dissolution on individual economies will then be determined by the extent to which it affects their supply-side capacity – this is a function of the supply of labour⁷, the size of the capital stock and economy-wide productivity levels. The diagram below depicts this in a simplified manner, showing how the key channels of impact (trade and FDI) directly affect different components of demand, determining short-run changes in GDP, and different components of supply, which determine the long-run level of GDP that we present in our results.

Fig. 1. How impact channels affect GDP in the short and long run



We used theoretical and empirical evidence from academic literature to calibrate a full range of ‘input’ assumptions associated with WTO dissolution that could be used with the Oxford Economics Global Economic Model to determine the ultimate impact on long-run potential output. This provided us with a holistic picture of the potential impact of WTO dissolution around the world (a detailed overview of our methodological approach is contained in the Appendix).

⁶ As noted in the Appendix, we draw upon the work of Yotov et al (2019), who estimate the gains to trade from the WTO across both members and non-members.

⁷ The role of trade openness in influencing labour market outcomes is controversial, with no broad consensus on the scale or even direction of the effects. In common with most studies into the welfare effects of international trade, we therefore assume full employment in the long run, with reallocation of a fixed domestic labour force to sectors with comparative advantage.

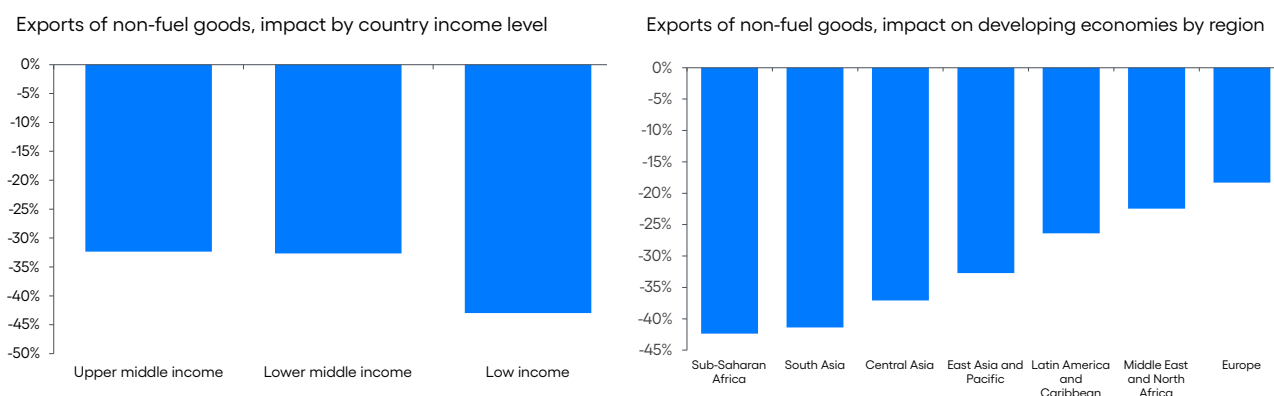
3. Economic impact results

3.1 Impact on trade flows

Exports of low-income countries are hit hardest

Aggregating across our country sample, we find that WTO dissolution would lower exports of developing countries by around a third, comparing to a baseline where the “status quo” of the rules-based multilateral trading system remains intact. Within this group, low-income countries would be worst affected, with exports reduced by around 43% by 2030, also compared to this baseline; exports of middle-income countries would be lowered by around 32% by 2030 (Figure 2). This reduction in trade volumes stems from an increase in trade costs linked to higher information costs and uncertainty, as well as more restrictive government policies.

Fig. 2. Long-term trade impacts of WTO dissolution on developing countries (relative to baseline)



The substantial hit to exports of developing countries also reflects three key factors:

1. For developing countries, the WTO currently provides access to new markets with larger and more developed economies, opening up significant opportunities for export growth and diversification. Many of these benefits would be lost following WTO dissolution.
2. Least Developed Countries (LDCs) also currently benefit from preferential treatment (including duty-free and quota-free access to markets in some developed countries) and additional support from the WTO, such as technical advisory and capacity-building interventions.
3. Exporters in developing countries often stand to benefit more from the public goods provided by the WTO (such as setting norms, harmonisation of trade procedures and statistics, and producing knowledge products) as they are typically relatively small and the lumpy cost of acquiring information is comparatively large.

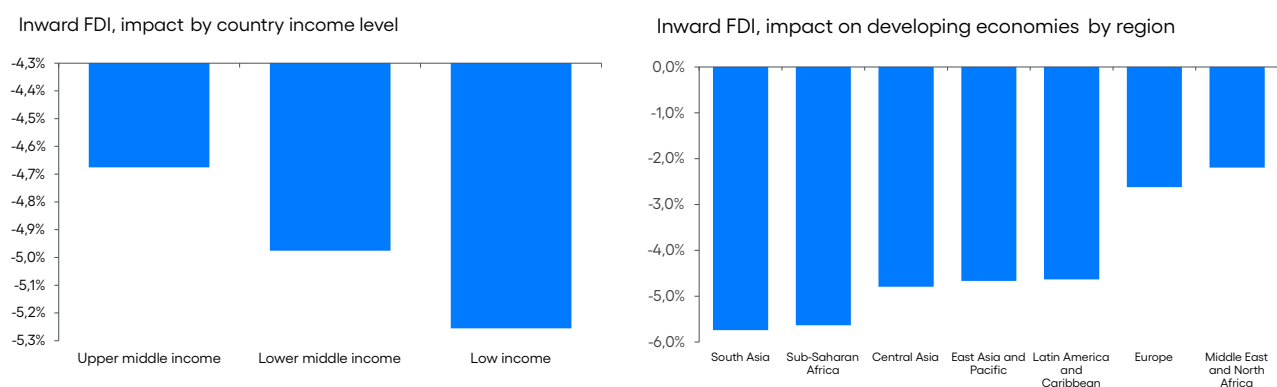
The resulting reconfiguration of trade relationships would imply a trend toward less multilateralism and increased regional fragmentation. At a regional level, trade flows for the nations of Sub-Saharan Africa and South Asia are most exposed to WTO dissolution, reflective of the large number of LDCs within these groupings. Conversely, developing economies in Europe and the Middle East would be far more sheltered. This reflects the higher share of middle-income countries in these regions and their relatively high propensity to trade with high income countries, features that soften the impact of WTO dissolution at a country level.

3.2 Impact on foreign direct investment

Reduced trade would have knock-on effects to FDI

The repercussions of dismantling the WTO would not be limited to trade flows and their knock-on impact to domestic investment levels. Many studies have shown there to be a complementary relationship between inward foreign direct investment (FDI) and trade openness. The causal link may operate in both directions – for example, foreign companies trading with a new market learn more about its economic, political and social conditions, giving them the confidence to establish subsidiaries in the foreign market, which may themselves eventually begin to export. The WTO can also have a direct influence on FDI through its influence on policy uncertainty, given that cross-border investment decisions depend on transparency and certainty of the regulatory environment.

Fig. 3. Long-term FDI impacts of WTO dissolution on developing countries (relative to baseline)



Our estimates suggest that the absence of a WTO would reduce FDI flows to developing countries by around 5% in aggregate. However, Figure 3 again shows that this headline global impact masks a significant difference in impact on inward FDI at a regional level. This is mainly a function of the distribution of trade impacts.

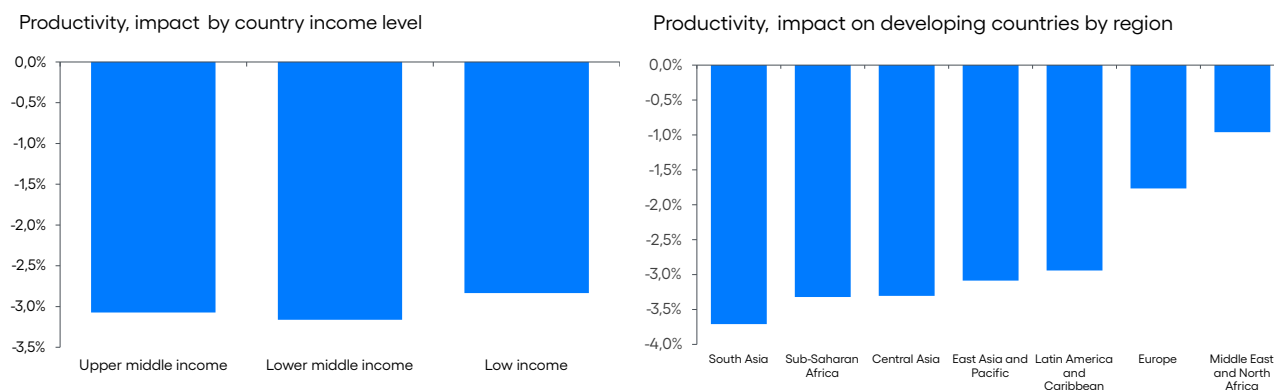
3.3 Impact on productivity levels

Trade and inward FDI also influence domestic productivity trends

There is also a large body of empirical evidence indicating that an increased stock of FDI leads to higher productivity of domestic firms. This reflects knowledge transfer through a variety of channels: imitation of FDI firms' production processes by local firms; hiring of workers by multinationals, transferring new knowledge and advanced managerial skills to the local workforce; and increased competition from multinationals, forcing domestic firms to use existing technologies more efficiently. Also, the FDI firms themselves tend to have high productivity, making a significant contribution to the economy.

Similarly, there is evidence that trade openness is also positively associated with productivity. For example, this may be because increased openness to trade raises the competitive pressures on domestic firms to adopt the most productive ways of operating and facilitates the process of specialisation.

Fig. 4. Long-term productivity impacts of WTO dissolution on developing countries (relative to baseline)



We find that productivity levels are reduced by around 3% on average across developing countries. With the estimated whole-economy productivity effects related to impacts on trade intensity and the stock of FDI, however, it is perhaps not surprising that the poorer regions of the world again suffer the biggest setbacks, with Europe and the Middle East proving more resilient.

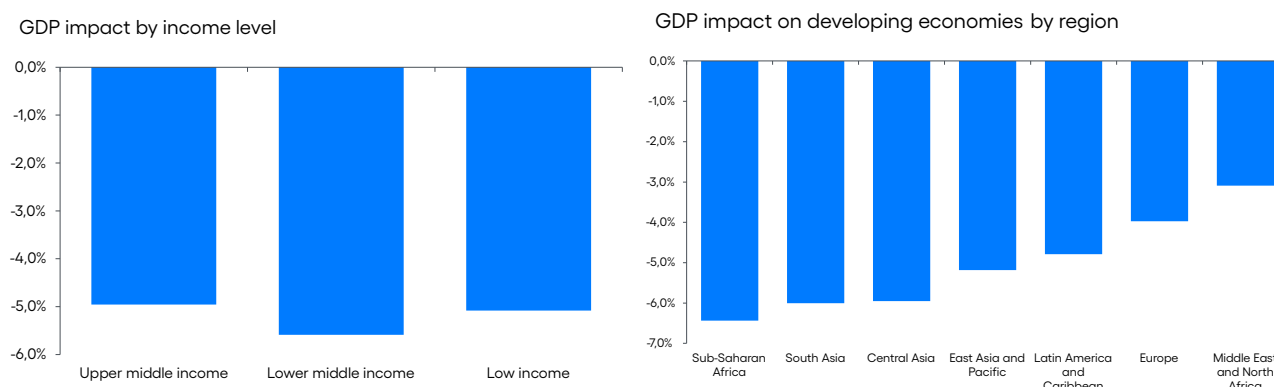
3.4 Impact on GDP

The direct hit to incomes from WTO dissolution would be sizeable

Pulling together the various calibrated impacts as inputs to the Oxford Global Economic Model, we are able to size the total long-term impact of WTO dissolution through these various channels. Our estimates indicate that the implications for are substantial and far-reaching, entailing a 5.1% long-term annual GDP output loss for developing countries in aggregate, compared to the “status quo” baseline.

In percentage impact terms, these output losses would fall disproportionately on the poorest and most vulnerable nations of Sub-Saharan Africa, as well as South and Central Asia, with output losses averaging around 6%-6.5%. This would slow the process of trade-led convergence that has already enabled many developing economies to narrow the income gap with developed nations. It should be noted that this also has negative implications for producers in de-veloped countries, as it lowers cost-effective access to international suppliers and so reduces global supply chain resilience – this could expose developed countries to increased volatility during crisis periods.

Fig. 5. Long-term GDP impacts of WTO dissolution (relative to baseline)



There are few other studies to benchmark these GDP estimates

We are not aware of any other studies to date that have attempted to quantify the economic impact of WTO dissolution. In fact, it is also rare for empirical researchers investigating the benefits of the WTO to look beyond trade to assess what this implies for GDP. One exception is a study by the UK's Department of International Trade (2022), who find that the WTO has supported an average increase in exports of 35% globally, resulting in a 4% average increase in per capita GDP.

As mentioned previously, the impact of WTO dissolution is unlikely to be the mirror image of the benefits of the WTO. So, it is not too surprising to find that our estimated losses to trade and GDP are smaller than the WTO benefits estimated in the DIT paper. The implied elasticity between trade and GDP is also somewhat higher in our study, although this may reflect that the DIT paper did not take account of FDI flows or dynamic productivity gains.

Appendix I: Methodology

This section provides a methodological overview of the approach and assumptions used to quantify the impact of WTO dissolution. As discussed in the main report, a set of modelling assumptions were calibrated to align with the key transmission channels through which WTO membership impacts the global economy. This includes direct trade effects (with implications for domestic investment), as well as associated impacts on FDI and productivity. We describe the quantification of each of these transmission channels in turn below, before then discussing how they were brought together to quantify the overall long-run effects on GDP.

Modelling framework and transmission channels

We modelled the impact of WTO dissolution across a sample of close to 200 individual countries. Theoretical and empirical evidence from academic literature was gathered to calibrate a full range of ‘input’ assumptions associated with WTO dissolution that could be used to determine the ultimate impact on long-run potential output for each economy. The modelling comprised the following key stages:

1. Estimated impact on trade flows associated with increased trade costs resulting from WTO dissolution.
2. Direct impact on GDP from reduced trade flows, leveraging a CGE model approach. This takes into account the reallocation of domestic resources, but not international capital flows or dynamic productivity effects.
3. Calibration of additional effects on FDI and productivity.
4. Bringing together the various impact channels above, we leveraged the Oxford Global Economic Model to quantify the total long-run GDP impacts.

In the following sub-sections we begin by introducing the gravity model approach to estimating WTO trade impacts before describing each element of the modelling process in turn.

Gravity model estimates of WTO trade gains

Gravity modelling has been a key tool of the empirical trade literature for the last two decades, stemming from the ground-breaking work of Anderson and Van Wincoop (2003). This strand of research is firmly grounded in latest trade theories such as New Trade theories pioneered by Dixit-Stiglitz-Krugman in the late 1970s and the “new” New Trade theories first developed by Melitz (2003). Empowered by the availability of granular and panel trade data, this class of model has shown a remarkable ability to explain the dynamics of bilateral flows of trade in goods, services and investments. In recent years, the model has become the most popular tool for ex post evaluation of trade policy (UNCTAD/WTO, 2016).

We were therefore able to draw upon an established body of academic literature that has rigorously evaluated the impact of the WTO on global trade flows. Within this literature, Yotov et al. (2019) draw from a large dataset of bilateral trade flows across all countries in the world and apply the “gold-standard” in the empirical structural gravity literature (Anderson

and Yotov, 2012). Their modelling approach comprehensively captures the multitude of factors that may affect the cost of trade between a given pair of countries (such as distance, common language, colonial heritage, etc.). A dummy for regional trade agreements also helps capture the impact of other agreements in place between two countries which would be more preferential and comprehensive than what is agreed at the WTO. This is important to ensure the pure “WTO effect” is isolated from other influences on trade flows.

The researchers also account for intra-national trade flows in their econometric model. This allows for the identification of unilateral and country-specific determinants of international trade, such as the unilateral effects of WTO/GATT membership. Without these intra-national trade flows (which are not directly affected by changing of WTO/GATT membership status), the change in WTO/GATT membership would be captured by the importer-time and exporter-time fixed effects. Furthermore, this inclusion would account for possible trade diversion effects of GATT/WTO membership from domestic sales. Dai et al. (2014) demonstrate that the estimates of free trade agreements are biased downward in regressions that only rely on international trade flows. Again, this helps to reinforce the reliability of the authors’ WTO-specific impact estimates.

Last but not least, the paper employs a longer time series (covering the 1986 to 2016 period) than most other comparable studies. Because the benefits of trade agreements take years to materialize (Hannan, 2016), earlier ex post evaluations studies that use a short time spell covering the WTO “treatment” period would underestimate the impacts. Incorporating an extended period allows them to identify the effect in switching membership status by over 40 countries with varying conditions such as population size, geography, economic conditions, and institutions.

Although it could be argued that the authors’ estimates should be updated using more recent data, in practice the addition of a few years’ of data would not significantly change their results. It should also be borne in mind that data for the post-2019 period is distorted by the effects of the pandemic and the war in Ukraine, so this data would usually be disregarded as representing an exceptional (non-representative) period.

Results from this gravity model provided a starting point for our analysis of WTO dissolution. In particular, we made use of parameters estimated in Table 2, column (7) of the paper, where the impact is broken down by income level and WTO status of the country pairs. This helps us better account for the heterogeneity of impacts across countries.

Trade impacts of WTO dissolution

Whereas Yotov et al (2019) examine the trade benefits of WTO membership, we wish to understand the potential losses from WTO dissolution. As discussed in the main report, we cannot assume that the impact of WTO dissolution would simply be the mirror-image of the positive benefits of WTO membership. In particular, the world is now so closely integrated through global value chains (GVCs) that incentives to adopt protectionist policies have been permanently reduced.

We begin with estimates derived from Yotov et al. (2019), which provide the full trade cost reduction associated with WTO membership (additional to any existing RTA). Drawing from

evidence in Koopman (2020) and Rubínová and Sebti (2021) on the breakdown of trade costs faced by exporters to developed and developing economies, we decompose Yotov's total cost estimates into three channels of impact influenced by the WTO, namely:

- **Trade policy restrictiveness:** Tariffs and non-tariff barriers (such as regulatory measures, quotas, local-content requirements, border formalities, etc.)
- **Uncertainty:** The predictability of trade policy, which is currently underpinned by the rules-based multilateral trading system.
- **Information costs:** Information-gathering costs, which are currently reduced by the WTO as it publishes trade policy review reports and online databases for all its members.

We then divide country pairs into two groups. For country pairs with an RTA in place, we apply an increase in trade costs only associated with increased uncertainty and information frictions. For country pairs without an RTA in place, we also include an additional cost associated with increased policy restrictiveness. To inform the level of policy restrictiveness to apply, we draw from Beshkar and Lashkaripour (2020), who use a game theory approach to calculate optimal trade barriers when trade agreements are dissolved. They find that countries with higher import dependency should be less willing to increase protectionism. We infer from their estimates the degree to which policy restrictiveness is tightened when countries factor in GVC ties. To create a global sample, we extrapolate beyond the initial 40 countries in their WIOD sample based on their estimated elasticity between trade barrier escalation and import intensity.

Long-run GDP impacts from direct trade effects

Having estimated the extent of trade destruction that may be associated with WTO dissolution across our sample of countries, we then proceeded to estimate the associated knock-on effects to economic output for each nation. We began by considering the effects on GDP associated directly with reduced trade flows. The UK Department of International Trade (2022) attempt this analysis using the World Input-Output Database (WIOD) within a CGE framework, although their sample is constrained to only around 40 (mainly developed) economies. In contrast, we perform this analysis using an expanded framework based on trade/GDP elasticities that are benchmarked from the same CGE framework, with variations included to take account of differences in country trade intensities. This approach allows us to generate consistent economic impact results across our whole country sample.

While the outputs from a CGE model are useful for estimating the direct impacts of trade on an economy through domestic investment patterns, this framework does not account for international flows of capital, nor does it consider dynamic effects on productivity. We therefore calibrated these additional impacts separately.

Inward foreign direct investment

We performed a review of the empirical literature examining the relationship between trade openness and FDI to calibrate these effects. Elasticity estimates vary across studies, although this may be explained by differences in the choice of countries studied. In general, we found that results indicated a higher FDI-trade elasticity for low-income countries compared to industrialised nations. Our final estimate was an elasticity on trade

openness of 0.06 for industrialised economies and 0.1 for developing – this generally falls within the median range of estimates from our literature review, as summarised in the table below.

Summary of literature review on FDI-trade elasticity

Study	Country sample	Period	Elasticity of inward FDI on trade openness
Bayraktar (2015)	30 developing countries	2004-2013	0.031 to 0.143
Aizenman and Noy (2006)	81 countries	1982-1998	0.06 for developing, 0.04 for industrialised
Asiedu (2002)	71 countries	1988-1997	0.030 to 0.035
Gastanaga et al (1998)	49 countries	1970-1995	0.063 to 0.078

Total factor productivity

Among studies that use cross country panel data, the relationship between total factor productivity (TFP), FDI, trade openness and other key drivers is somewhat mixed. Results are sensitive to both the selection of the sample of countries, as well as the choice of econometric methodology including model specification.

We employed an elasticity on FDI of 0.07 for this study, drawing upon earlier econometric estimates by Oxford Economics (2016) based on a sample of 25 countries. This elasticity estimate for FDI is similar in magnitude to those found in Baltabaev (2014), based on a sample of 49 developed and developing countries. In addition, we applied an elasticity of 0.08 on trade openness, which is also of the same order of magnitude as Baltabaev's findings.

Overall GDP impacts

Drawing together the various calibrated transmission channels – direct trade impacts, FDI and productivity – we employed the Oxford Global Economic Model to estimate the resulting cross-country economic impacts. The GEM is the most widely used commercial macroeconomic model in the world. 85 of the largest economies are covered in depth by individual country models, with the remainder accounted for by proxy models and regional blocs. In the long run, each of the economies behaves like the classic one sector economy under Cobb-Douglas technology. Countries have a natural growth rate, which is determined by its capital stock, labour supply adjusted for human capital, and TFP. Output cycles around a deterministic trend, so the level of potential output at any point in time can be defined.

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